WEEKLY EPIDEMIOLOGICAL REPORT
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WER SRI LANKA - 2005

Vol. 32 No. 01 **1st – 7th January 2005**

Mental Health in Emergencies

In the aftermath of an emergency, the primary attention is automatically directed at basic needs such as food, water and shelter and then the physical health issues. If the health care system is overburdened, mental health can often be forgotten or neglected. However, mental health issues are as important as physical health issues and also closely linked with social issues.

Likewise, many people who have survived the tsunami disaster may be going through difficult emotions including shock, disbelief, feeling disoriented and frightened, being tearful, angry or bewildered. Sleeplessness, nightmares, tremors, chest pain and other somatic symptoms will be commonplace as will be hysterical reactions. Under the circumstances these are natural reactions and do not amount to mental pathology. For some people self-recovery can take place without outside psychological intervention. It is only for some people that external help to varying extent will be needed to understand the reality and to lead the life back to normal. .

All psychological and social Interventions should be preceded by careful planning and broad assessment of the local context. These include the assessment of the setting, culture, history and the nature of the problem, local perceptions of distress and illness, ways of coping, community resources etc. the best would be a qualitative assessment of context with a quantitative assessment of disability or daily functioning. Needs should be prioritized, and local resources and potential external resources be identified. Existing social networks should be used to the maximum - especially religious leaders, volunteer and organizations would be very useful.

Interventions should involve consultation and collaboration with other governmental and non-governmental organizations. A multitude of agencies operating independently without co-ordination causes wastage of valuable resources. Led by the health sector, mental health interventions should be carried out within general primary health care set up and should maximise care by families and active use of resources within the community.

In the aftermath of a population's exposure to severe stresses, more attention is paid for the short-term relief of psychological distress during the acute phase. However, medium- and long-term interventions are equally important and should develop community based and primary mental health care services and social interventions.

Intervention strategies

Interventions vary depending on whether the society is in a phase of acute emergency or in the reconsolidation phase. The acute emergency phase is defined as the period where the crude mortality rate is substantially elevated and basic needs (i.e. food, shelter, security, water and sanitation, access to PHC, management of communicable diseases) are deprived or threatened. This period is fol-

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lowed by a reconsolidating phase when basic needs are again at a level comparable to that before the emergency or in case of displacement are at the level of the surrounding population. It is the responsibility of primary health care workers to ensure providing the best for the victims. The following are important interventions to meet the objective:

Psychological First Aid
Listen,
Convey compassion,
Assess needs,
Ensure basic physical needs are met,
Do not force talking,
Provide or mobilize company from preferably family or significant others,
Encourage but do not force social support,
Protect from further harm

In acute emergency phase:

Social intervention:

- Establish and disseminate an ongoing reliable flow of credible information on (a) the emergency; (b) efforts to establish physical safety for the population, (c) information of relief efforts and (d) the location of relatives to enhance family reunion (and if feasible establish access to communication with absent relatives). Information should be uncomplicated and empathic.
- Organise family tracing for unaccompanied minors, the elderly and other vulnerable groups.
- Brief field officers in the areas of health, food distribution, social welfare and registration regarding issues of grief, disorientation and need for active participation.
- Organise shelter in order to keep members of families and communities together.
- Consult the community regarding decisions where to locate religious places, water supply in the camps. Provide religious, recreational and cultural space within the camp.
- Encourage the re-establishment of normal cultural and religious events (including grieving rituals in collaboration with religious dignitaries).
- Encourage activities that facilitate the inclusion of orphans, widows, widowers or those without their families into social networks.
- Encourage starting schooling for children as early as possible, even partially.
- Involve adults and adolescents in concrete, purposeful, common interest activities (e.g. constructing/ organizing shelter, family tracing, distributing food, organizing vaccinations, and teaching children).
- Widely disseminate uncomplicated, reassuring, empathic information on normal stress reactions to the community at large. The information should emphasise an expectation of natural recovery.

Psychological interventions:

- Most acute mental health problems during the acute emergency phase are best managed without medication following the principles of 'psychological first aid'. **Anti-depressants and anxiolytic medications should not be used routinely**. Prescriptions should not be for periods longer than about 10 days if prescribed at all.
- Urgent psychiatric complaints such as dangerousness to self and others, psychoses, severe depression, mania and epilepsy should manage establishing contact with local curative health care services. Ensure availability of essential psychotropic medications that they need.
- Organize outreach and non-intrusive emotional support in the community by providing, when necessary, aforementioned 'psychological first aid'. Because of possible negative effects, it is not advised to organize forms of single-session psychological debriefing that push persons to share their personal experiences beyond what they would naturally share.
- If the acute phase is protracted, start training and supervising PHC workers and community workers.

In reconsolidation phase:

During the reconsolidation phase, while continuing the activities that is initiated during the acute phase, the following activities are suggested:

Social interventions:

- Organize outreach psycho-education to educate the public on availability or choices of mental health care. Commencing no earlier than four weeks after the acute phase, carefully educate the public on the difference between psychopathology and normal psychological distress
- Encourage application of pre-existing positive ways of coping. The information should emphasize positive expectations of natural recovery.
- Over time, if poverty is an ongoing issue, encourage economic development initiatives - for example, micro-credit schemes or income-generating activities.

Helping children

Every possible attempt should be made not to separate children from families and relatives.
Children are allowed to express their feelings if they wish to do so.
Encourage the expression grief in a culturally appropriate way. Use cultural and religious beliefs to manage it.
Children should be protected from endless repetition of the events of the tsunami. E.g.: watching television news coverage (there is evidence that such viewing has been damaging to children after 9/11 incidence).
Children are given other activities such as playing, reading and drawing.
Schools should be opened as soon as possible.
Teachers should meet regularly to share concerns and ideas.
Counselling or direct psychological interventions are not indicated in the immediate aftermath and even may do more harm than good.

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Table 1: Vaccine-preventable diseases & AFP

25th - 31st December 2004 (53rd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2004	Number of cases during same week in 2003**	Total number of cases to date in 2004	Total number of cases to date in 2003**	Difference between the number of cases to date between 2004 & 2003**
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	01 KD=1	00	00	00	00	00	00	01	-	99	-	-
Diphtheria	00	00	00	00	00	00	00	00	00	-	01	-	-
Measles	00	00	00	00	00	00	00	00	00	-	80	-	-
Tetanus	01 GM=1	00	00	00	00	00	00	00	01	-	46	-	-
Whooping Cough	00	00	00	00	00	00	00	01 KG=1	01	-	53	-	-
Tuberculosis	05	00	00	04	00	00	15	00	24	-	7883	-	-

Table 2: Diseases under Special Surveillance

25th - 31st December 2004 (53rd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2004	Number of cases during same week in 2003**	Total number of cases to date in 2004	Total number of cases to date in 2003**	Difference between the number of cases to date between 2004 & 2003**
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	45	02	00	00	13	10	00	05	75	-	15414	-	-
Encephalitis	00	00	00	00	01 PU=1	00	00	00	01	-	110	-	-
Human Rabies	00	00	00	00	00	00	00	00	00	-	96	-	-

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

** For the 53rd week, no comparison is made with year 2003 .

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Monaragala, RP=Ratnapura, KG=Kegalle.

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Psychological interventions:

- Educate, train and supervise other humanitarian aid workers and community leaders (e.g., village leaders, teachers, etc) in core psychological care skills (e.g., 'psychological first aid', emotional support, providing information, sympathetic reassurance, recognition of core mental health problems) to raise awareness and community support and to refer persons when necessary.
- Train and supervise PHC workers in basic mental health knowledge and skills (e.g., 'psychological first aid', supportive counseling, working with families, suicide prevention, substance use issues and referral).
- Ensure continuation of medication by psychiatric patients.
- Facilitate creation of community-based self-help support groups. The focus of such self-help groups is typically problem sharing, brainstorming for solutions or more effective ways of coping (including traditional ways), generation of mutual emotional support and sometimes generation of community level initiatives.

Source:

- Centre for National Operations. Guidance for Health Professionals working with affected people.http://www.cnosrilanka.org/reports/psychpsocal.doc (Accessed: 20. 01. 2005)
- WHO. Mental Health in Emergencies. (WHO/MSD/MER/03.01). World Health Organization, Geneva 2003.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

18th – 25th December 2004 (53rd Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptospirosis		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	26	3544	01	300	00	03	00	48	00	64	03	133	00	90	**85**
Gampaha	18	3015	05	348	00	11	00	75	00	44	00	133	01	197	**64**
Kalutara	01	1249	02	571	00	04	01	87	00	26	01	179	00	101	**80**
Kandy	01	2281	01	494	00	02	01	149	00	81	01	47	00	124	**64**
Matale	01	357	05	815	00	00	01	43	00	22	01	74	00	173	**58**
Nuwara Eliya	00	65	00	343	00	00	04	240	00	54	00	18	00	27	**86**
Galle	00	268	00	260	00	05	00	09	00	78	00	94	00	08	**13**
Hambantota	00	84	00	474	00	00	00	24	00	26	00	46	00	14	**20**
Matara	00	389	00	216	00	01	00	106	00	50	00	140	00	20	**00**
Jaffna	00	98	01	145	00	03	07	768	03	16	00	03	00	79	**63**
Kilinochchi	00	01	00	60	00	00	00	12	00	06	00	01	00	07	**00**
Mannar	00	03	00	96	00	01	00	73	00	19	00	01	00	30	**100**
Vavuniya	00	62	00	233	00	02	01	111	00	05	00	00	00	06	**50**
Mullaitivu	00	00	00	23	00	00	00	24	00	02	00	00	00	08	**00**
Batticaloa	00	101	00	69	00	02	00	35	00	00	00	02	00	113	**14**
Ampara	00	64	00	348	00	00	00	19	00	05	00	12	00	15	**29**
Trincomalee	00	269	01	596	00	00	00	126	00	47	00	05	00	358	**43**
Kurunegala	06	854	10	802	00	08	02	112	00	44	00	47	01	68	**88**
Puttalam	07	715	02	278	01	07	00	166	00	25	00	07	00	38	**67**
Anuradhapura	02	475	03	478	00	03	00	83	00	97	00	50	00	45	**53**
Polonnaruwa	08	238	04	253	00	00	09	59	01	11	01	67	01	17	**71**
Badulla	00	136	10	1312	00	09	00	134	00	49	01	33	03	271	**87**
Monaragala	00	49	06	450	00	06	02	107	00	50	03	48	02	134	**80**
Ratnapura	01	467	04	698	00	36	03	267	00	61	01	108	00	114	**67**
Kegalle	04	474	06	351	00	04	00	25	00	18	00	178	01	105	**80**
Kalmunai	00	156	00	50	00	03	00	85	00	03	00	01	00	55	**00**
SRI LANKA	**75**	**15414**	**61**	**10063**	**01**	**110**	**31**	**2987**	**04**	**903**	**12**	**1427**	**09**	**2217**	**55**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 8th January 2005 :Total number of reporting units = 270.

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Comments and contributions for publication in the WER Sri Lanka are welcome. However, the editor reserves the right to accept or reject items for publication. All correspondence should be mailed to The Editor, WER Sri Lanka, Epidemiological Unit, P.O. Box 1567, Colombo or sent by E-mail **chepid@sltnet.lk**

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WER SRI LANKA - 2005

Vol. 32 No. 02 **8th - 14th January 2005**

Open vial policy for EPI liquid vaccines

Since the commencement of the Expanded Programme of Immunization (EPI) in Sri Lanka opened multi-dose vaccine vials were discarded at the end of each immunization session regardless of the type of vaccine or the number of doses remaining in the vial. One objective of this practice is to ensure the maximum quality of the vaccine provided. Opening of a multi-dose vial disregarding the number of recipients in each clinic session also ensured the maximum coverage. During the last two and half decade the national immunization programme in Sri Lanka could achieve a very high coverage. For example, there is over 90% coverage for all vaccines received during infancy (BCG, DPT, OPV and Measles) and during pregnancy (TT).

The infrastructure facilities for EPI within the maternal and child health care delivery system have been markedly improved over the time. The knowledge and skills of primary health care team is also at a higher stand. Since the inception of the EPI, through research and development the thermostability of these vaccines also has been improved significantly. There is more knowledge about the impact of time and other factors on potency and safety of vaccines. As a result, in 2000, the World Health Organization issued a policy statement for the use of opened multi-dose vials of vaccines in subsequent immunization sessions without compromising the quality of vaccines and the safety of its administration. This has been the practice in many countries for last few years.

Vaccines that can be used in subsequent sessions.
- **OPV**
- **DPT**
- **TT**
- **DT**
- **ATd**
- **JE**
- **Hepatitis B**

Up to 1995 all vaccines for EPI were provided by donor agencies free of charge. Now, the EPI programme of Sri Lanka has been procuring its total vaccine requirement (excluding Hepatitis B vaccine) using budgetary allocations for health. Global Alliance for Vaccines and Immunization (GAVI) is funding for AD syringes until 2005 and for Hepatitis B vaccine until 2007. Thereafter, the government funds will be needed for the procurement. The estimated cost for all vaccines and AD syringes for 2006 is over Rs. 300 million. Reduction of wastage of vaccines will bring down the total cost for vaccines and will also ensure financial sustainability of the national immunization programme. Since Sri Lanka has achieved a high coverage and is armed with a skilled primary health care team, backed by good infrastructure facilities it is the time to consider the ways and means of reducing the cost for immunization without compromising the quality.

After considering all the factors, the National Advisory Committee on Communicable Diseases decided to introduce the open vial policy in Sri

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Lanka from this year. The final decision will be taken depending on a pilot study that is currently in progress. Thereafter, open multi dose vials of all liquid vaccines could be used in subsequent sessions.

Vaccines that SHOULD NOT be used in subsequent sessions.

BCG
Measles
Rubella
MR

Freeze-dried vaccines

The heat stability of freeze-dried vaccines drops substantially when these vaccines are reconstituted with their diluents. Most freeze-dried vaccines do not contain preservatives and consequently must not be kept more than the manufacturer's recommended limit and never longer than six hours after they are reconstituted. WHO reported that death due to toxic shock syndrome has resulted when reconstituted live virus vaccines kept longer than the recommended period have been injected. Hence, reconstituted, left over vaccines should never be used in subsequent immunization sessions.

Practical Points

- Opened multi-dose vials could be reused within four weeks from its opening. However, the following conditions should be fulfilled before reusing the vaccines:
  - The expiry date has not passed
  - All conditions apply for the maintenance of cold chain for the unopened vials also should apply for the opened vials as well.

Potency of vaccine

The potency of vaccine in an opened vial over time is determined primarily by:

- The heat stability of the particular vaccine; and
- Whether or not the vaccine has been reconstituted.

The vaccine in opened vials of OPV, DPT, TT, DT, aTd, JE and Hepatitis B (liquid vaccines) remains potent as long as vials are stored under appropriate cold chain conditions and the expiry date has not passed. A good indicator of excessive exposure to heat is the vaccine vial monitor (VVM), which is now in use for OPV and Hepatitis B vaccines.

Safety of vaccine

The safety of vaccine in a multi-dose vial is primarily dependent on:

- Risk of contamination with a pathogenic organism: and
- Bacteriostatic or virucidal effect of preservatives in the vial.

The risk of contamination is higher in a multi-dose vial than in a single-dose vial because the vaccine is repeatedly exposed- every time a dose is withdrawn.

Liquid injectable vaccines such as DPT, TT, DT etc. contain preservatives that prevent growth of bacterial contamination. Should contamination take place within the vial, the action of these preservatives prevents any increase in bacterial growth over time and actually decreases the level of contamination.

- The potency of all inactivated vaccines could be affected when these vaccines are exposed to a temperature below 0°C. This can happen if these vials come in contact with ice or ice packs. To prevent this, the following measures should be taken:
  - Freeze ice packs well for minimum of 48 hours before using.
  - When ice packs are taken out of the freezer, keep them in room temperature for about 10 minutes, until the outer layer of ice in the ice packs becomes water (To prevent inactivate vaccines getting exposed to sub zero temperature during packing and transport).
  - Put inactivated vaccine vials in to a small plastic container and then place in the vaccine carrier.
  - Use the indicated number of cold packs when vaccine carrier is being used to transport vaccines (This maximises the cold holding time).
  - If the vaccine vial monitor (VVM) attached to Hepatitis B vaccine reached the discard point all vaccine in the vaccine carrier should be discarded. (Hepatitis B vaccine is the most heat resistant vaccine).
  - If the VVM of Polio vaccines has reached the discard point while those in Hepatitis B vaccines has not reached, decision on the status of the cold chain of the other vaccines can be based on the availability of un-melted ice still in the ice packs of vaccine carrier.
- All doses of vaccines should be withdrawn from vaccine vials under aseptic conditions.
- AD syringes should be used when they are available.
- When AD syringes are not available, only sterile reusable needles and syringes that is provided with steam sterilizsers should be used.
- Vaccine vials should not be submerged in water while transport in the vaccine carrier and during the session because there is a possibility of contamination through the vaccine vial septum. The vial septum should remain dry and clean during the transport and during the session.
- All inactivated vaccine vials can be kept in a dry container without using cold water in the container during the session, since inactivated liquid vaccines can withstand several hours of room temperature without compromising the potency.
- However, OPV vials should be kept in contact with ice or ice water as practiced now.

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Table 1: Vaccine-preventable diseases & AFP

1st – 7th January 2005 (1st Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00 KL=1	00	00	00	00	00	00	01 KG=1	02	00	02	00	-
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00.0%
Measles	00	00	00	00	00	01 PO=1	00	00	01	02	01	02	-50.0%
Tetanus	00	00	00	00	00	00	00	00	00	02	00	02	-100.00%
Whooping Cough	00	00	00	00	00	00	00	02 KG=2	02	01	02	01	+100.0%
Tuberculosis	155	44	00	03	17	04	00	00	223	71	223	71	+214.1%

Table 2: Diseases under Special Surveillance

1st – 7th January 2005 (1st Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	19	04	00	00	10	11	00	02	46	69	46	69	-33.3%
Encephalitis	00	00	00	00	00	00	00	01 RP=1	01	01	01	01	00.0%
Human Rabies	00	00	00	00	00	00	00	00	00	02	00	02	-100.0%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Monaragala, RP=Ratnapura, KG=Kegalle.

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- When the opened vaccine vials are received back from the clinics before putting back them in to the refrigerator a decision should be taken on whether the vaccines can be re-used or not depending on the above guidelines .
- **DDHS/ MOH should specially identify and train a member from his/ her staff for this responsibility.**
- The opened vials should be kept in a separate container when they are stored in the refrigerator after the clinic sessions.
- In every clinic session previously opened vaccine vials should be used first, before opening any new vaccine vial.

Source:

1. World Health Organization. The use of opened multi-dose vials of vaccine in subsequent immunization sessions (WHO/V&B/00.09).WHO, Geneva. 2000
2. World Health Organization. Thermostability of vaccines. (WHO/GPV/98.07). WHO, Geneva. 1998

Table 3: Selected notifiable diseases reported by Medical Officers of Health

1st - 7th January 2005 (1st Week)

DPDHS Division	Dengue Fever / DHF*		Dysen-tery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	08	08	05	05	00	00	01	01	00	00	00	00	00	00	00	00	46
Gampaha	08	08	02	02	00	00	00	00	00	00	01	01	00	00	00	00	36
Kalutara	03	03	01	01	00	00	00	00	00	00	00	00	00	00	00	00	40
Kandy	04	04	02	02	00	00	01	01	00	00	00	00	00	00	00	00	55
Matale	00	00	08	08	00	00	00	00	00	00	01	01	00	00	00	00	67
Nuwara Eliya	00	00	00	00	00	00	05	05	00	00	00	00	00	00	00	00	86
Galle	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	50
Hambantota	00	00	01	01	00	00	01	01	00	00	01	01	00	00	00	00	60
Matara	00	00	00	00	00	00	00	00	00	00	00	00	00	00	01	01	14
Jaffna	00	00	01	01	00	00	10	10	00	00	00	00	01	01	00	00	25
Kilinochchi	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
Mannar	00	00	00	00	00	00	04	04	00	00	00	00	00	00	00	00	83
Vavuniya	00	00	01	01	00	00	01	01	00	00	00	00	00	00	00	00	50
Mullaitivu	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
Batticaloa	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	57
Ampara	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	29
Trincomalee	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	11
Kurunegala	02	02	08	08	00	00	01	01	00	00	00	00	00	00	01	01	65
Puttalam	08	08	02	02	00	00	01	01	00	00	00	00	00	00	00	00	78
Anuradhapura	07	07	06	06	00	00	00	00	00	00	06	06	00	00	06	06	74
Polonnaruwa	04	04	01	01	00	00	04	04	00	00	02	02	00	00	00	00	57
Badulla	00	00	14	14	00	00	01	01	04	04	02	02	01	01	04	04	53
Monaragala	00	00	02	02	00	00	00	00	00	00	00	00	00	00	00	00	40
Ratnapura	01	01	08	08	01	01	06	06	00	00	00	00	01	01	00	00	53
Kegalle	01	01	09	09	00	00	01	01	00	00	00	00	00	00	00	00	90
Kalmunai	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	20
SRI LANKA	46	46	71	71	01	01	37	37	04	04	13	13	03	03	12	12	51

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 15th January 2005 :Total number of reporting units = 270.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WEEKLY EPIDEMIOLOGICAL REPORT
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WER SRI LANKA - 2005

Vol. 32 No. 03 **15th – 21st January 2005**

Blood transfusion safety

Blood transfusion is an essential part of modern health care. Millions of lives all over the world are saved each year through blood transfusion. However, people still die due to inadequate supply or the lack of timely availability of blood and blood products. Globally this has a particular impact on women (as a consequence of pregnancy related complications), on children (malnutrition, malaria and severe life-threatening anaemia) and on trauma victims. On the other hand as with any therapeutic intervention, blood transfusions may result in acute or delayed complications and carry the risk of transmission of infectious agents, such as HIV, hepatitis virus, syphilis and malaria. The emergence of HIV in the 1980s particularly highlighted the importance of ensuring the safety of blood supplies. However, in many countries the recipients remain at risk of transfusion-transmissible infections (TTI) mainly due to poor blood donor recruitment and selection practices and the use of untested units of blood.

To make blood transfusion beneficial and risk free, blood transfusion services has a common need to ensure:

- Availability of adequate supplies of blood and blood products and their accessibility to all patients requiring transfusion.
- Safety of blood and blood products.
- Safe and appropriate clinical use of blood and blood products.

In order to ensure the provision of safe, high quality blood and blood products that are accessible to all patients requiring transfusion and their safe and appropriate use, the World Health Organization recommends several strategies. They are:

- Establishment of a well-organized, nationally co-ordinated blood transfusion service that can provide adequate and timely supplies of safe blood for all patients in need.
- Collection of blood only from voluntary unpaid blood donors at low risk of TTI, and use of stringent blood donor selection criteria.
- Testing of all donated blood for TTI, blood groups and compatibility.
- Production of blood components to maximize the use of donated blood and to enable the provision of therapeutic support for patients with special transfusion requirements.
- Appropriate clinical use of blood and the use of alternatives, where possible, to minimize unnecessary transfusions.
- Safe transfusion practice at the bedside.
- Comprehensive quality system covering the entire transfusion process, from donor recruitment to the follow-up of transfusion recipients.

National blood transfusion services

The provision of safe and adequate blood supply at national level is the responsibility of the government/ national health authority of

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the country. The national blood transfusion service should be an integral part of the country's national health care policy and health care infrastructure. It should be responsible for establishing and maintaining a national quality system, including the development of guidelines and standards, staff training, a data/ information management system and a system for monitoring and evaluation of all the blood transfusion activities.

The first blood bank in Sri Lanka was started in 1950s at the General Hospital, Colombo. This gradually evolved to the current network of blood banks centrally co-ordinated by the National Blood Transfusion Service (NBTS). The current NBTS fulfils the above mentioned requirements.

Voluntary blood donation

The cornerstone of a safe and adequate supply of blood and blood products is the recruitment, selection and retention of voluntary, non-remunerated blood donors from low risk populations.

In Sri Lanka paid donor scheme ceased to function in 1970s. The replacement donation by relatives of hospitalized patients is still functioning. However, they are not pressurized to donate blood. Rather they are counselled on the importance and value of blood donation motivating them for voluntary donation. Over the years blood donation has gradually increased to reach 170000 units in 2004. The target for 2005 is 200000 units of blood. Activities such as continuous donor counselling, awareness programmes in schools, in the community and for donor organizers, establishment of Young Donor Clubs, Rare Donor Club, E-Donor Clubs have increased the number of regular voluntary donors during past years. The National Blood Transfusion Service in Sri Lanka targets 100% voluntary regular blood collection by 2006.

Testing and processing

Testing of all donated blood for TTI is one of the strategies to ensure safe blood. All the blood donated to the NBTS are routinely tested for HIV I & II, Hepatitis B, Syphilis and Malaria. A pilot study regarding screening for Hepatitis C is being carried out recently. This testing will be expanded to the whole country in near future. Blood is also tested for compatibility before transfusion.

Safe blood is a precious gift from blood donors. To ensure that the use of donated blood is maximized, blood is processed into blood components so that a number of patients can benefit from a single donation. This also lengthens the period of usage of blood products. For example, fresh frozen plasma can be kept for one year in contrast to whole blood which expires in 35 days after collection. NBTS processes more than 95% of collected blood. All peripheral blood banks are equipped for most of the procedures. Several identified blood banks in Teaching Hospitals and General Hospitals are fully equipped for all procedures and cater to requirements of other blood banks in their respective surrounding areas.

Safe and appropriate use

Despite many precautions taken, blood transfusions may still place the recipients at risk of TTI and blood reactions. Inappropriate transfusions may also widen the gap between the supply and demand and may contribute to shortages of blood and blood products for patients requiring transfusion. Thus, it is necessary to reduce the unnecessary transfusions. This can be achieved through the appropriate clinical use of blood, minimizing the need for transfusion and using alternatives to blood transfusions. The transfusion is deemed appropriate when it is used to treat conditions leading to significant morbidity and mortality that cannot be prevented or managed effectively by other means. The commitment of the health authorities, health care providers and clinicians are important in prevention, early diagnosis and treatment of diseases/ conditions that could lead to the need for blood transfusion…….

Quality management programme

Implementation of quality management systems in Blood Transfusion Services ensures improvement in the safety, adequacy and quality of blood for patients requiring blood transfusion. This significantly reduces morbidity, mortality and burden of disease due to unsafe transfusion. Quality management systems should be developed both nationally and regionally. This also should be coupled with comprehensive training of all categories of staff, development of monitoring and evaluation systems and if possible, external quality assessment schemes.

All personnel appointed to blood banks undergo an orientation programme at the Central Blood Bank of the NBTS. A Quality Management Section and a Quality Assurance Laboratory was established at NBTS one and half years ago. This ensure safety of on all aspects in the process 'vein to vein' (form donors vein to the recipients vein) and includes, reagents, equipments, collection, storage & transportation of blood and transfusion. With the collaboration of the Sri Lanka Standard Institution, the NBTS has initiated development of GMP standards that include, aware-

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

8th - 14th January 2005 (2nd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	01 MT=1	00	01 PU=1	00	00	00	02	00	04	00	-
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00.0%
Measles	00	00	00	00	00	00	00	00	00	02	01	04	-75.0%
Tetanus	00	00	00	00	00	00	00	00	00	00	01	02	-50.00%
Whooping Cough	00	00	00	01 JF=1	00	00	00	01 RP=1	02	01	04	03	+33.3%
Tuberculosis	143	42	00	23	13	00	07	23	251	94	474	165	+187.3%

Table 2: Diseases under Special Surveillance

8th - 14th January 2005 (2nd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	20	07	00	00	12	00	00	10	49	16	141	160	-11.9%
Encephalitis	00	00	00	00	00	00	00	00	00	00	01	03	-66.7%
Human Rabies	00	00	00	01 KN=1	01 KR=1	00	00	00	02	00	03	02	50.0%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Monaragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

ness programmes for workers, internal auditing, equipment calibration and establishment of annual instrument maintenance contracts. External quality assurance schemes also have been established with Thailand, UK and Australia for blood grouping serology and TTI screening.

A National Blood Transfusion Policy has already been compiled. This will pave the way for the development of a blood transfusion Act. It will be an important step towards strengthening blood transfusion activities. This will also provide a clear opportunity to monitor and coordinate activities of blood banks in private hospitals.

Source:

- World Health Organization. Blood Transfusion Safety. http://www.who.int/bloodsafety/en/ [Accessed: 01. 02. 2005]
- National Blood Transfusion Service of Sri Lanka [Personal Communication]

Table 3: Selected notifiable diseases reported by Medical Officers of Health

8th - 14th January 2005 (2nd Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	11	30	15	21	00	00	01	02	00	06	03	04	00	00	02	02	**69**
Gampaha	07	32	01	09	00	00	03	04	00	02	01	02	00	00	01	01	**57**
Kalutara	02	06	03	05	00	00	00	00	00	00	00	00	00	00	01	01	**40**
Kandy	06	10	11	14	00	00	01	02	00	00	00	00	01	01	00	00	**55**
Matale	01	03	07	16	00	00	01	01	00	00	08	11	00	00	00	00	**67**
Nuwara Eliya	00	00	00	00	00	00	03	08	00	00	00	00	01	01	01	02	**43**
Galle	00	00	00	00	00	00	00	00	00	00	01	01	00	00	00	00	**38**
Hambantota	00	00	04	05	00	00	02	03	00	00	00	01	00	00	00	00	**100**
Matara	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	01	**07**
Jaffna	00	01	03	08	00	00	05	18	00	01	00	00	02	05	04	06	**75**
Kilinochchi	00	00	00	00	00	00	00	00	00	02	00	00	00	00	00	00	**25**
Mannar	00	00	02	02	00	00	00	04	00	00	00	00	00	00	01	01	**67**
Vavuniya	00	06	00	04	00	00	00	24	00	00	00	00	00	00	00	00	**50**
Mullaitivu	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	**00**
Batticaloa	00	00	00	01	00	00	00	00	00	00	00	00	00	00	00	09	**57**
Ampara	00	00	01	09	00	00	00	00	00	00	00	00	00	00	00	00	**14**
Trincomalee	00	03	03	08	00	00	00	00	01	05	00	00	00	00	03	08	**56**
Kurunegala	05	10	12	25	00	00	03	06	00	00	01	02	00	00	00	03	**94**
Puttalam	07	15	01	03	00	00	01	02	00	00	00	00	00	00	00	00	**78**
Anuradhapura	00	07	01	07	00	00	00	00	00	00	03	09	00	00	00	06	**32**
Polonnaruwa	00	06	02	03	00	00	01	05	00	00	00	02	00	00	00	00	**57**
Badulla	00	00	07	23	00	00	03	04	00	04	01	03	00	04	02	06	**67**
Monaragala	00	00	02	09	00	00	00	00	00	00	03	10	03	03	02	03	**40**
Ratnapura	06	07	12	21	00	01	07	14	00	00	03	03	00	01	01	01	**80**
Kegalle	04	05	07	16	00	00	00	01	00	00	01	01	00	00	00	00	**70**
Kalmunai	00	00	00	00	00	00	00	00	00	00	00	00	00	00	01	02	**20**
SRI LANKA	**49**	**141**	**94**	**209**	**00**	**01**	**31**	**98**	**01**	**20**	**25**	**49**	**07**	**15**	**19**	**52**	**55**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 22nd January 2005 :Total number of reporting units = 270.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WER SRI LANKA - 2005

Vol. 32 No. 04 **22nd - 28th January 2005**

Disease control in tsunami affected areas in Sri Lanka - Key to success

Experience from the past was that more people could die due to infections and illness that follows, than that due to direct causes of an emergency or a disaster. In the aftermath of the tsunami that struck Southeast Asia on 26 December 2004, WHO warned that unless immediate public health interventions were taken, there was a possibility that the region might face severe disease outbreaks. But all tsunami-affected areas in Southeast Asia have so far been spared from any major health catastrophes.

Many health care institutions from Teaching Hospitals and General Hospitals, to MOH offices, Gramodaya Health Centres and Maternal and Child Health Clinics in the tsunami-affected areas were physically affected. Many were partially damaged while a few were completely destroyed. Some health care providers also either perished by the tsunami or were survivors of affected families. Despite facing all these challenges, in the aftermath of the tsunami the health sector in Sri Lanka had an enormous task to fulfil. As expected, the health sector response was prompt and task oriented. Among many of the health needs, disease surveillance, investigation & control of disease outbreak also received preference.

Very next day - on 27th December, at the Epidemiological Unit, guidelines for prevention of disease outbreaks were prepared. Formats for collection of basic data on affected people and for surveillance of communicable diseases were also designed. Armed with the guidelines and designed formats, Epidemiologists from the Epidemiological Unit visited the affected areas by 28th December to make a quick situation analysis. They also provided advice and coordinated activities of local health administration.

In relation to the control of disease outbreaks, the main requirements were provision of safe food and water, safe disposal of human excreta, and fly & mosquito control. Since malnourished are more prone to infections, adequate nutrition was also a requirement. During the immediate post-tsunami period, affected majority were provided food cooked elsewhere. This was soon followed by mass preparation of cooked food at welfare centres. In most welfare centres, this gradually converted to preparation of food by family units or small groups. Water brought using water tankers was stored in plastic tanks. Chlorination was used as the common method of water purification. Tropical chloride of lime and chlorine tablets were adequately distributed in all affected areas. Chlorinometers were also distributed to monitor the process. However, where chlorinometers were not available, adequate chlorination could be guessed by observing the chlorine odour in water. Although donors provided bottled drinking water at the initial stage, this was not encouraged due to several reasons. Potable water could be obtained from adjoining areas and

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this could be effectively purified by chlorination. The environmental hazard caused by piling up of emptied water bottles was also a reason not to encourage this practice. Even in future instances this practice should be discouraged.

Mass immunization for vaccine preventable diseases such as measles, typhoid fever, viral hepatitis and cholera was considered not necessary. Correctness of this decision was proved by the non reporting of out breaks of any of these diseases among tsunami affected communities. The only immunization carried out on a large scale was against tetanus. This also was selective for those who sustained injuries during the disaster.

Most of the welfare centres for displaced were established in schools or religious centres. These places already had a certain number of latrine facilities. This partially solved the problem of excreta disposal. In almost all welfare centres, temporary latrines were established. In most areas, disposal of solid waste was co-ordinated by the respective Local Government. Adjoining non-affected Local Governments also supported in this effort. In addition, burying of waste locally also carried out. The immediate commencement of removal of debris in affected areas minimized mosquito/fly breeding. In addition, insecticides were sprayed in and around welfare centres. These efforts coupled with educating people in welfare centres on personnel hygiene and nutrition showed results.

Regional Epidemiologists (RE) carried out surveillance activities. They were guided and monitored centrally by the Epidemiological Unit. Collection of information was welfare centre based. This is because most of the displaced were in these centres and they were the most vulnerable group.

Respective Divisional Directors of Health Service/ Medical Officers of Health had to collect data from each welfare centre and consolidate figures for the MOH area. They were supposed to forward these figures to the Deputy Provincial Director of Health Services/ Regional Epidemiologist. The RE had to submit these figures to the Epidemiological Unit. Initially, these figures were collected on a day to day basis. Once the acute phase was passed and there was no immediate threat of disease outbreaks, data collection was phased out on a weekly basis. To expedite the collection of data and to relieve RE form an extra burden, the Epidemiological Unit actively collected data by telephoning RE at regular intervals.

There were some instances where an increased number of cases or clustering of cases were reported. Most frequently encountered were watery diarrhoea, viral fever and respiratory tract infections. A few cases of dysentery and mumps were also reported. However, no major disease outbreaks were reported during the past five weeks.

The Epidemiological Unit believes that this success could be achieved due to several reasons:

- The awareness among people about infectious diseases, mode of spread and prevention is high. They easily grasp health messages delivered. This is a direct result of high literacy rate due to long existing 'free education' and the universal accessibility to 'free health' of the country.
- The high commitment of local health teams and the timely coordination by the central level. Although some of the local health personnel also were affected by the disaster, they showed a very high commitment to the cause. Without this many of the activities planned could not have been implemented.
- The financial support provided by the World Health Organization and the World Bank, and the material support by the UNICEF was crucial. Thanks to their generous grants it was possible to attend on urgent requirement in provision of water, sanitation and solid waste disposal and many other activities which directly and indirectly contributed to disease control and prevention.
- The mobilization of both preventive and curative health sector personnel from several non-affected areas provided a great assistance. Thereby close supervision of activities at welfare camps was possible. This also improved curative health sector activities which was supplementary to disease control activities.
- The support furnished by the local and international community. This was voluntary and prompt. It helped to fill the vacuum created by the difference in the demand and the availability in 'man, money and material'.
- Delegation of power in decision making and execution. Shortcutting lengthy decision making and executing them, the power for this was delegated. This enabled prompt action at local level.
- Making and implementing correct decisions. It was essential to decide correctly at all levels what to do and also what not to do. The success achieved itself proves that in general, correct decisions were made and implemented.

Although the immediate crisis period is passed, still there is the potential risk for spread of diseases. People are in the process of moving out of welfare centres to temporary houses. These houses are having better sanitation facilities than welfare centres. However the facilities available are

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

15th - 21st January 2005 (3rd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	00	00	00	00	00	01	04	01	+300.0%
Diphtheria	00	00	00	00	00	01 AP=1	00	00	01	00	01	00	-
Measles	00	00	00	00	00	00	00	00	00	02	01	07	-85.7.0%
Tetanus	00	00	00	00	00	00	00	00	00	00	02	03	-33.3%
Whooping Cough	02 CB=1 GM=1	00	00	00	00	00	00	01 KG=1	03	02	07	09	-22.2%
Tuberculosis	80	08	31	06	10	20	00	29	184	00	658	165	+298.8%

Table 2: Diseases under Special Surveillance

15th - 21st January 2005 (3rd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	59	01	01	04	15	04	01	03	88	154	268	482	-44.4%
Encephalitis	00	00	00	01 VA=1	00	00	00	00	01	03	02	06	-66.7%
Human Rabies	00	00	00	00	00	00	00	00	00	00	06	03	100.0%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Monaragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

not optimal. Some people are moving into places where their old houses were. The concern is again, safe water and excreta disposal. Wells previously used may be contaminated and cleaning is needed. New latrines are needed where they were destroyed. Piling up of garbage also may facilitate fly and mosquito breeding.

Surveillance activities in such a situation could be much harder and complicated than that in a welfare centre where all people are clustered and easily accessible. Hence, primary health care workers have to concentrate much on identification of risk behaviours and do corrective actions. Close vigilance for any cases of infectious diseases such as diarrhoea, dysentery, enteric fever, viral hepatitis, dengue fever and malaria is essential. Primary health care workers have to actively identify such cases in the community rather than waiting till hospital notification is received.

The Epidemiological Unit gratefully appreciate the support it received from all local and foreign personnel and organizations in fulfilling its duties and responsibilities at this challenging hour.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

15th - 21st January 2005 (3rd Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	42	92	04	25	00	00	02	04	00	06	01	05	01	01	02	04	62
Gampaha	14	52	03	14	00	00	00	04	02	04	01	03	00	00	00	02	64
Kalutara	03	09	02	14	00	00	00	00	00	00	00	02	00	00	00	01	50
Kandy	01	14	03	20	00	00	00	02	00	00	00	00	00	01	01	01	36
Matale	00	03	10	26	00	00	01	02	00	00	02	14	00	00	00	00	42
Nuwara Eliya	00	00	02	02	00	00	01	09	00	00	00	00	00	01	00	02	71
Galle	01	01	02	03	00	00	00	00	00	00	00	01	00	00	00	00	44
Hambantota	00	00	06	11	00	00	00	03	00	00	03	04	02	02	00	00	90
Matara	00	01	00	04	00	00	00	00	00	02	00	02	01	01	00	01	14
Jaffna	00	01	01	09	00	00	13	32	00	02	00	00	00	12	03	10	75
Kilinochchi	00	00	00	00	00	00	00	00	00	02	00	00	00	00	00	00	00
Mannar	00	00	00	02	00	00	06	10	02	02	00	00	00	00	00	01	83
Vavuniya	02	08	03	12	01	01	16	47	00	00	00	00	00	00	00	00	100
Mullaitivu	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
Batticaloa	00	00	02	03	00	00	00	00	00	00	00	00	00	00	06	15	71
Ampara	00	00	00	09	00	00	00	00	00	00	00	00	00	00	00	00	14
Trincomalee	02	05	03	11	00	00	00	00	00	05	00	01	00	00	02	10	44
Kurunegala	07	18	09	34	00	00	00	05	00	00	00	02	00	00	00	03	71
Puttalam	08	27	03	06	00	00	01	03	00	00	00	00	00	00	00	00	56
Anuradhapura	02	10	02	10	00	00	01	03	00	00	05	17	00	00	03	11	74
Polonnaruwa	02	09	00	03	00	00	04	09	00	00	01	03	00	00	00	00	86
Badulla	00	00	15	45	00	00	01	05	00	04	00	04	00	04	02	08	60
Monaragala	01	01	03	16	00	00	00	00	00	00	01	13	00	04	03	09	70
Ratnapura	03	11	17	40	00	01	03	17	00	00	01	05	00	01	00	01	73
Kegalle	00	06	02	33	00	00	00	01	00	00	00	01	00	01	00	01	50
Kalmunai	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	02	20
SRI LANKA	88	268	92	352	01	02	49	156	04	27	15	77	04	28	22	82	56

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 29th January 2005 :Total number of reporting units = 270.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WEER SRI LANKA - 2005

WEEKLY EPIDEMIOLOGICAL REPORT

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Vol. 32 No. 05 **29th January - 04th February 2005**

The health response after the tsunami - Thailand experience

The earthquake triggered devastating tsunami on 26 December 2004, caused an estimated 225 000 deaths in 8 countries (India, Indonesia, Malaysia, Maldives, Seychelles, Somalia, Sri Lanka and Thailand) on 2 continents. In Thailand, 6 provinces were affected, including prominent international tourist destinations. Thailand has a well-developed public health infrastructure that provides residents with more than 90% of their health care. The Thai Ministry of Public Health (MOPH) responded with rapid mobilization of local and non-local clinicians, public health practitioners and medical supplies, assessment of healthcare needs, identification of the dead, injured and missing as well as active surveillance of the syndromic illness. The MOPH response was augmented by technical assistance from the Thai MOPH–United States Centers for Disease Control and Prevention Collaboration (TUC) and the Armed Forces Research Institute of Medical Sciences (AFRIMS), with support from the Office of the WHO Representative to Thailand. The experiences in Thailand underscore the value of written and rehearsed disaster plans, capacity for rapid mobilization, local coordination of relief activities and active public health surveillance.

Rapid response

The MOPH rapidly activated mass casualty plans and deployed personnel and resources to meet local health-care needs. On 26 December, a central command centre in Bangkok and command centres in each of the 6 affected provinces were established to coordinate activities. Deployments included approximately 100 teams providing emergency clinical care, 12 teams providing technical support and health education, 5 teams conducting active surveillance and investigating potential outbreaks, 6 teams providing mental health support and 3 teams of MOPH accredited massage therapists providing traditional Thai massage therapy for relief workers and displaced people. The first team from Bangkok arrived on 26 December, approximately 6 hours after the tsunami struck. As of 9 January 2005, an estimated 90 000 people in affected communities, relief centres and shelters for displaced people had received medical and mental health care; 9798 received outpatient services, 2233 received inpatient services (398 were in intensive care and 1254 underwent major surgical procedures) and approximately 80 000 received other types of care from mobile teams. Outbreak risks and sanitation, environmental and community mental health needs were rapidly assessed and addressed. Health education programmes on personal hygiene, water and food safety, rubbish disposal, toilet construction, injury prevention and mental health were initiated. Laboratories used for disease surveillance were supplemented with additional staff and equipment; food, drinking-water and sea water were assessed for safety.

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Health and needs assessment

As seen in other disasters, rapid health assessments can identify immediate health needs and help to prioritize public health interventions. Between 30 December 2004 and 6 January 2005, 3 teams of Thai and United States health professionals from TUC and AFRIMS conducted a rapid health and needs assessment in the affected provinces. Logistic and strategic support was provided by the Joint United States–Thai Military Advisory Group. Using a WHO rapid assessment tool, investigators collected data on hospital characteristics; damage to buildings and communication, electricity, water and sewage systems; adequacy and condition of health-care personnel, medical supplies and morgue facilities; and anticipated medical needs. Questions were initially directed to provincial health-office staff members. However, on the recommendation of provincial staff, personnel from 10 mainland hospitals and leaders from approximately 12 coastal and island communities in the 6 affected provinces were also interviewed.

These health assessments indicated that, despite a huge influx in the number of patients, the medical system was intact and functioning effectively. The 10 hospitals, with approximately 2000 inpatient beds and 24 operating rooms, served as the primary referral centres for tsunami-related medical care. None of the 10 hospitals was damaged by the tsunami; all had activated **previously rehearsed, written mass casualty plans**. Shortages of blood, blood products and certain medical supplies (e.g. surgical devices and antibiotics) were noted during the first 2 days after the tsunami. Hospital morgue facilities were inadequate for the number of dead, and corpses were moved from hospitals to temporary morgues at nearby wats (temples).

Rapid mobilization of health professionals from several areas in Thailand resulted in adequate numbers of staff. By 30 December, hospital patient loads were returning to normal levels, and the supplementary medical staff were released. By 4 January, provincial health officials reported that needs for staff and supplies were being met. However, coordination of relief efforts was a challenge. One province was required to coordinate the concurrent activities and service areas of 14 health teams from volunteer organizations.

Temporary clinics were established by provincial medical staff and volunteer organizations in some coastal villages and in shelters for displaced people. In the hospitals and communities assessed, food and bottled water were plentiful, and written guidance on water decontamination was posted.

Public health surveillance

Since 1970, the MOPH has operated a national passive surveillance system for infectious diseases by using a standard reporting form; as of 2000, the system had 68 diseases under surveillance. After the tsunami, the MOPH implemented active surveillance for 20 of these diseases plus wound infections and electric shock Active surveillance was initiated in all 20 districts in the 6 provinces affected by the tsunami. Surveillance was established between 26 December and 2 January. Data for the 20 districts were collected from all medical facilities (77 health centres, 22 public hospitals and 4 private hospitals), the 2 shelters for displaced people and the 2 forensic identification centres. Surveillance team members visited each site daily and collected individual case-report forms that included information on disease syndrome, age, sex and nationality.

Each day, these teams analysed data and identified events requiring further investigation and preventive measures. Population data for 2004 from the Thai Ministry of the Interior were used to calculate incidences. The incidences of febrile illness and pneumonia were comparable with those during the same period a year ago. Cases of acute diarrhoeal disease increased steadily until 3 January; since then, the number has stabilized at approximately 100 case reports per day. Between 26 December and 11 January, 7 disease clusters were detected; all were diarrhoeal disease. Implementation of active surveillance enhanced detection of diarrhoeal disease. The annualized rate from active surveillance was 1.7 times greater than that recorded from passive surveillance during the same period a year ago (2950 cases per 100 000 population versus 1758). The incidence of wound infections was substantially higher than that recorded in previous years. Active disease surveillance continues in the 6 affected provinces.

Active disease surveillance was useful in identifying disease events and clusters requiring intensive investigation. Although active surveillance demonstrated an increase in the number of cases of acute diarrhoea, much of this increase can likely be attributed to active searching for rather than passive reporting of cases. In comparison with the post-tsunami rates of diarrhoeal disease observed in Thailand (2950 cases per 100 000 population), the rate of diarrhoeal disease during previously studied outbreaks in disaster settings in other countries has been much higher

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

22nd - 28th January 2005 (4th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	01 GL=1	00	00	00	00	00	01	07	05	08	-37.5%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	00	-
Measles	00	00	00	01 TR=1	00	01 AP=1	00	00	02	00	03	07	-57.1%
Tetanus	00	00	00	00	00	00	00	00	00	02	03	05	-40.0%
Whooping Cough	00	00	00	00	00	00	00	00	00	01	10	10	00.0%
Tuberculosis	25	14	35	15	32	00	00	24	145	243	803	408	+96.8%

Table 2: Diseases under Special Surveillance

22nd - 28th January 2005 (4th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	32	01	00	03	06	01	01	05	49	182	359	744	-51.7%
Encephalitis	00	00	00	01 BT=1	00	00	00	00	01	03	03	10	-70.0%
Human Rabies	00	00	00	00	00	00	00	00	00	00	06	03	+100.0%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Monaragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

(87 000–120 000 cases per 100 000 population). The increased number of wound infections suggests that many who survived the initial impact of the tsunami were injured by debris.

Substantial challenges remain for Thailand, including identification of approximately 5000 bodies and return of remains to the families of victims in Thailand and other countries. Forensic experts from Thailand and approximately 30 other countries are working together to complete the identification and processing of human remains. Other challenges include maintaining active surveillance to detect infectious disease outbreaks, treating wound infections, preventing post-traumatic injuries, maintaining safe drinking-water and sanitation, and meeting mental health needs. As of 19 January 2005, a total of 7423 survivors had sought psychiatric help. Further mental health interventions will likely be needed to mitigate the post-disaster effects on residents of coastal communities.

Source: World Health Organization. Rapid health response, assessment and surveillance after a tsunami, Thailand, 2004–2005. Weekly Epidemiological Record, 2005; 80: 55–60.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

22nd - 28th January 2005 (4th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	23	138	05	31	00	00	02	06	02	08	00	05	00	01	03	09	77
Gampaha	08	71	03	20	00	00	00	05	00	04	00	03	00	00	04	08	50
Kalutara	01	10	01	15	00	00	01	03	00	00	00	03	00	00	00	03	40
Kandy	01	15	06	32	00	00	03	07	00	00	01	01	02	04	00	02	82
Matale	00	03	01	36	00	00	00	02	00	00	03	18	00	00	00	00	58
Nuwara Eliya	00	00	07	12	00	00	05	14	00	00	01	01	01	02	00	02	100
Galle	00	01	02	06	00	00	00	00	00	00	01	02	00	00	00	00	69
Hambantota	00	00	01	12	00	00	00	03	00	00	03	07	01	03	00	00	90
Matara	00	02	02	09	00	00	01	01	00	02	00	02	00	02	00	01	14
Jaffna	00	01	02	11	00	00	14	51	00	02	00	00	08	23	01	11	63
Kilinochchi	00	00	00	00	00	00	00	00	00	02	00	00	00	00	00	00	25
Mannar	00	00	00	02	00	00	01	11	23	25	00	00	00	00	00	01	83
Vavuniya	03	11	03	15	00	01	25	72	00	00	00	00	00	00	00	00	75
Mullaitivu	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
Batticaloa	00	00	00	03	01	01	01	01	00	00	00	00	00	00	03	18	71
Ampara	00	00	01	11	00	00	00	01	00	00	01	01	00	00	00	01	43
Trincomalee	00	05	02	13	00	00	00	00	00	05	00	01	00	00	02	13	44
Kurunegala	03	23	13	47	00	00	03	08	00	00	02	04	02	02	03	07	94
Puttalam	03	32	01	07	00	00	00	05	00	00	00	00	00	00	00	00	44
Anuradhapura	01	13	01	25	00	00	01	06	00	00	00	22	00	00	01	13	47
Polonnaruwa	00	09	00	03	00	00	01	10	00	00	00	03	00	00	00	00	86
Badulla	01	01	10	63	00	00	03	08	00	04	03	08	00	04	04	15	67
Monaragala	00	01	06	22	00	00	01	01	00	00	03	17	02	06	00	09	60
Ratnapura	04	15	16	61	00	01	09	32	00	00	01	06	00	01	02	03	80
Kegalle	01	08	15	49	00	00	00	01	00	00	01	04	00	01	00	01	80
Kalmunai	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	02	40
SRI LANKA	49	359	98	505	01	03	71	248	25	52	20	108	16	49	23	119	64

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 05th February 2005 :Total number of reporting units = 270.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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Vol. 32 No. 06 **05th - 11th February 2005**

WER SRI LANKA - 2005

EPI coverage survey - 2004

Coverage assessment surveys of Expanded Programme of Immunization (EPI) are a routine activity that is being carried out by the Epidemiological Unit. For the last 18 years this has been done annually in various Deputy Provincial Director of Health Services (DPDHS) divisions with the sponsorship of World Health Organization. In 2004, the EPI coverage assessment survey was conducted in Anuradhapura DPDHS division.

The extent of Anuradhapura DPDHS division is 6664 km². with an estimated population of 755 000. The population density is 133 per km². Primary health care services in the district are provided by 18 Medical Officers of Health (MOH) divisions. Immunization services are conducted in 192 clinic centres distributed through out the district.

This survey was conducted in two consecutive dates in November 2004. During the survey, 3412 houses were visited to obtain the sample. The findings of this survey were consistent with the previous EPI vaccine coverage surveys and the survey coverage with EPI vaccines were higher than the reported figures. One reason is the errors of the denominator. Previous year's Crude Birth Rate is used in calculating the target population for the current year. Due to the constant decrease of the size of each year's birth cohort, calculations based on previous year's Crude Birth Rate usually overestimate the target population.

The main findings of this EPI vaccine coverage assessment survey are summarized in Tables 1- 4. The achievement of 100% coverage for all infant immunizations is highly commendable. In future this should be maintained with not allowing the enthusiasm among both parents and health workers to come down. More than 95% of examined children in this age group had developed the scar following BCG immunization. This is very satisfactory and indicates that the technique used in administration of BCG vaccine is of acceptable quality.

The high coverage observed for DPT/OPV 4th dose (99.3%) and for MR vaccine (98.3) that was introduced to the national immunization schedule in 2003 is a remarkable achievement. However, every effort should be made to reach all children completing infant immunization schedule with DPT/OPV 4th dose and MR vaccine. This will not be a difficult task.

Ten percent of children had not received due DT and OPV 5th booster dose and in another 15% of children who received those boosters were not recorded on their Child Health Development Record (CHDR). Proper planning of school immunization programme will improve the performance of the administration of this DT/OPV 5th booster and also the recording of those administered vaccines on the CHDR.. The coverage can also be brought to a higher level by implementing these immu-

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nization in field immunization clinics in addition to the school immunization programme.

Only 2.3% of the adolescents over 16 years of age had a record to prove that they had received TT/aTd booster between 10 - 15 years of age. Overall only 47% of them were able to recall that they received such a vaccine at school. This is another evidence that implementation of school immunization programme at MOH level is not satisfactory. It was also evident that awareness on the need and the importance of this booster was poor among both parents and the recipients.

There is a comparatively satisfactory coverage of rubella immunization among females of 8 - 15 years of age (77.5%) and 16 - 44 years of age (83.3%). This should be sustained and improved. Timing of this survey gave the opportunity to assess the coverage of the MR catch-up immunization programme conducted in September 2004. It was revealed that the coverage with cards was 61% and card and history was 81%. This is less than the targeted over 95% coverage and again proved that retention rate of special immunization cards issued during such campaigns is poor even for a few months after issuing. This problem may be solved to some extent with the introduction of new CHDR from 2005.

Table 1: Immunization coverage - BCG, DPT, OPV, Measles, MR, TT & aTd

Subjects	Antigen	No. surveyed	Card		Card + History	
			No.	%	No.	%
12 – 23 months old Children	BCG	300	297	99.0	300	100.0
	DPT 1	300	298	99.3	300	100.0
	DPT 2	300	298	99.3	300	100.0
	DPT 3	300	298	99.3	300	100.0
	OPV 1	300	298	99.3	300	100.0
	OPV 2	300	298	99.3	300	100.0
	OPV 3	300	298	99.3	300	100.0
	Measles	300	298	99.3	300	100.0
Mothers of 12 – 23 months old children	TT (New born protected)	297	185	62.3	295	99.3
24 – 36 months old children	DPT 4	300	282	94.0	298	99.3
	OPV 4	300	292	97.3	298	99.3
48 – 60 months old children	MR	300	280	93.3	295	98.3
72 – 84 months old children	DT/OPV 5	300	271	90.3	225	75.0
16 – 20 years old children	TT/ aTd	300	07	02.3	141	47.0
	Measles catch-up	300	185	61.7	224	74.6

For the first time, coverage of JE immunization was also assessed. It should be noted that the JE immunization was first introduced to Sri Lanka in 1988 in the Anuradhapura district for children one to ten years of age at that time . Children who were 9 years of age in 1988 were eligible for JE vaccine and they were 26 years old in 2004. Henceforth, all under 26 years and above two years of age, living in Anuradhapura district should have received a minimum of three doses of JE vaccine. During this survey JE immunization coverage was assessed among 6 cohorts of children and adolescents who were eligible to receive JE vaccine. Except for the adolescents age between 16 - 20 years and infants, all other cohorts showed a coverage over 90% for eligible primary doses. However, notable proportion (50.5%) of recipients who received primary series of JE

Table 2: Immunization coverage - JE

Subjects	Dose	No. surveyed	Card		Card + History	
			No.	%	No.	%
12 – 23 months old children	JE 1	300	162	54.0	166	55.3
	JE 2	300	156	52.0	161	53.7
24 – 36 months old children	JE 1	300	281	93.7	285	95.0
	JE 2	300	276	92.0	279	93.0
	JE 3	300	184	61.3	189	63.0
48 – 60 months old children	JE 1	600	586	97.7	593	98.8
	JE 2	600	578	96.3	585	97.5
72 – 84 months old children	JE 3	600	554	92.3	568	94.7
	JE 4	300	126	42.0	133	44.3
16 – 20 years old	JE 1	300	74	24.7	186	62.0
	JE 2	300	75	25.0	185	61.7
	JE 3	300	76	25.3	183	61.0
	JE 4	300	68	22.7	164	54.7

Table 3: Immunization coverage - Rubella

Subjects	No. surveyed	Card		Card + History	
		No.	%	No.	%
8 – 15 years old females	595	208	35.0	461	77.5
16 – 44 years old eligible females	600	245	40.8	500	83.3

Table 4: Coverage of Vitamin A mega dose administration

Subjects	No. surveyed	Card		Card + History	
		No.	%	No.	%
12 – 23 months old children (at 9th month dose)	300	148	49.3	162	54.0
24 – 36 months old children (at 18th month dose)	300	100	33.3	113	37.7

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP 29th January - 04th February 2005 (5th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	01 GL=1	00	00	00	00	00	01	05	05	13	-61.5%
Diphtheria	00	00	00	00	00	01 AP=1	00	00	01	00	01	00	-
Measles	00	00	00	00	00	00	00	00	00	00	03	09	-66.7%
Tetanus	00	00	00	01 BT=1	00	00	00	00	01	00	04	05	-20.0%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	10	10	00.0%
Tuberculosis	25	14	35	15	32	00	00	24	145	29	803	582	+38.0%

Table 2: Diseases under Special Surveillance 29th January - 04th February 2005 (5th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	35	04	02	05	15	00	01	02	64	09	438	813	-46.1%
Encephalitis	00	00	00	00	00	00	00	00	00	01	04	13	-69.2%
Human Rabies	01 KL=1	00	00	01 JF=1	00	00	00	00	02	00	08	04	+100.0%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Monaragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

immunization had not received a booster dose. The reason for low coverage among children age between 12 - 23 months is that proportion of those children were not eligible for JE immunization due to non-completion of one year at the time of the 2004 JE immunization campaign.

Coverage of Vitamin A mega dose that is given at 9 months and 18 months was also assessed during this survey on the request of UNICEF. Coverage of administration of Vitamin A mega dose at 9 months is 54% and at 18 months is 38% which is not satisfactory. Once the availability of Vitamin A mega dose is improved it will not be difficult to achieve the same high coverage as of measles at 9 months and DTP/OPV 4th dose immunizations at 18 months.

When the source of immunization is analysed, there is no participation of private sector in the delivery of immunization services in Anuradhapura and almost the sole responsibility in immunization is upon the government field health staff.

It is evident that in general, the overall performance of national immunization programme in the Anuradhapura DPDHS division is satisfactory. It is also worthy to note that still there is room for further improvement.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

29th January - 04th February 2005 (5th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	23	161	03	34	00	00	02	09	00	08	00	05	00	01	03	12	**85**
Gampaha	12	89	02	23	00	01	00	06	00	04	03	06	00	00	02	11	**79**
Kalutara	00	14	06	23	00	00	02	05	00	00	01	05	00	00	01	05	**70**
Kandy	04	19	08	42	00	00	01	08	00	00	01	02	05	09	01	03	**55**
Matale	00	03	05	53	00	00	02	04	00	00	00	19	00	00	00	00	**67**
Nuwara Eliya	00	00	07	19	00	00	00	14	00	00	00	01	00	02	01	03	**43**
Galle	00	01	04	10	00	00	01	01	00	00	01	03	00	00	01	01	**69**
Hambantota	01	01	08	20	00	00	02	05	00	00	01	08	02	05	00	00	**80**
Matara	01	04	00	12	00	00	01	02	00	02	03	07	02	06	00	01	**36**
Jaffna	00	01	04	16	00	00	09	61	00	02	00	00	02	28	02	13	**63**
Kilinochchi	00	00	00	00	00	00	00	00	00	02	00	00	00	00	00	00	**25**
Mannar	00	00	00	02	00	00	00	11	00	25	00	00	00	00	00	01	**17**
Vavuniya	00	12	00	15	00	01	01	73	00	00	00	00	00	00	00	00	**50**
Mullaitivu	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	**00**
Batticaloa	00	00	02	05	00	01	00	01	00	00	01	01	00	00	10	31	**71**
Ampara	00	00	00	13	00	00	00	01	00	00	00	01	00	00	00	01	**14**
Trincomalee	05	10	07	35	00	00	00	00	00	05	00	01	00	00	00	13	**44**
Kurunegala	04	30	07	56	00	00	00	08	00	00	00	05	00	02	01	09	**65**
Puttalam	11	43	02	09	00	00	05	12	00	00	01	01	00	00	01	02	**78**
Anuradhapura	00	13	00	26	00	00	00	06	00	00	00	24	00	01	00	14	**42**
Polonnaruwa	00	09	01	04	00	00	00	10	00	00	01	04	00	00	03	03	**57**
Badulla	01	02	15	83	00	00	05	13	00	04	00	09	00	04	02	21	**80**
Monaragala	00	01	03	25	00	00	02	03	00	00	06	25	04	10	00	10	**90**
Ratnapura	01	16	13	75	00	01	15	56	00	00	00	06	00	01	00	03	**87**
Kegalle	01	09	12	62	00	00	00	01	00	00	00	04	00	01	01	02	**70**
Kalmunai	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	02	**30**
SRI LANKA	**64**	**438**	**109**	**662**	**00**	**04**	**48**	**310**	**00**	**52**	**19**	**137**	**15**	**70**	**29**	**161**	**61**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 05th February 2005 :Total number of reporting units = 270.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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ON STATE SERVICE

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WEEKLY EPIDEMIOLOGICAL REPORT
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Vol. 32 No. 07 12th - 18th February 2005

WER SRI LANKA - 2005

COMBI in dengue control - Part I

During the last several years, primary health care workers in each high risk areas for dengue fever conducted awareness campaigns including health education talks, seminars, exhibitions etc. on dengue fever. From time to time, they had conducted cleaning programmes in these areas. In addition, the electronic and print media provided a large sum of information on dengue fever. The literacy of the community is high enough to understand the message provided. In schools too, there were many dengue fever related activities targeting school children. Dengue fever was one of the favourite topics for school projects among Advanced Level students.

However, despite growing knowledge and awareness, many people are still not taking action. Regrettably, an informed and educated individual is not necessarily a behaviourally responsive individual. The repercussion was evident during the last year with the worst dengue fever epidemic in the country.

Public health programmes, as a consequence, struggle along – with sub optimal behavioural impact and a continuing dilemma for health professionals has been finding effective ways to encourage the adoption of healthy behaviours at individual, household and community level. At the same time many promotion campaigns on commercial products could achieve desired behavioural changes among targeted groups of people to increase sales of those products.

Many public health awareness programmes focus only on changing people's knowledge and on raising awareness, believing that behaviour will change; when it doesn't (and it usually doesn't), the standard response is to bombard people with even more entomological and epidemiological facts. But more information, even presented in an attractive – eye catching manner rarely, in themselves, lead to behavioural responses if they are not behaviourally focused.

There are two main competitors to promoting healthy behaviour: when people *do nothing* against a particular problem or *do something else* that does not reduce the risk of contracting dengue fever or dying from dengue haemorrhagic fever. Numerous theories exist for explaining human behaviour. One basic understanding is that people perceive benefits and barriers to all behaviours. Different groups or segments of any population often perceive different barriers and benefits.

Programmes must be designed and delivered that remove the barriers and enhance the benefits for different segments of the populations served. The challenge here is twofold:

- to constantly ensure that the values of the new behaviour outweigh the values of the competing behaviour;
- to pay constant attention to the cost and convenience of the new behaviour compared with the competing behaviour.

By analysing the competition, you begin to understand why people may not do what you think they should do. At the same time, you move a little closer to knowing how to

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achieve and sustain behavioural results. Unfortunately, people do not change all of a sudden and remain "changed" from that moment onwards. Rather, people move through subtle stages: from becoming aware to becoming informed, becoming convinced, deciding to take action, taking action, repeating that action, and finally maintaining that action.

Most programmes usually manage to inform and convince, but often fail to provide an effective and feasible new behaviour, or to prompt people to take the necessary steps towards adopting and maintaining the new behaviour. One can with ease achieve the preliminary goals of increasing awareness, informing, educating, and convincing individuals about what needs to be done. It is quite another challenge to achieve and sustain behavioural results.

It may be that an individual cannot change his or her behaviour unless the setting in which he or she lives or works is also changed. The task is to discover how to make this setting an "enabling" environment, one that supports, for example, new behaviours, perhaps by providing more effective legislation, better housing construction techniques, improved services or superior policies.

However, an enabling environment may be insufficient without simultaneously addressing the gap between knowledge and action, the competition to healthy behaviour, and the gradual stages of behaviour change. For example, in areas where piped water supplies are available, traditional water storage practices could continue because of peoples' preference to well water over chlorinated water for drinking and cooking purposes. There may also be socioeconomic reasons for continued water storage, including the inability or reluctance to pay water rates, poor quality of water, low water pressure, and frequent breakdowns in water supply.

When we turn back on IEC activities on dengue fever it would reveal that they were usually based on a set of routine activities and is repeated every year. In many of the instances the same activity is conducted among different categories of community without any adaptation to suit to each category. Creativity and novelty were lacking. There was no prior evaluation of needs. Interventions were carried without pre-testing the methodology simply believing that they would bring the desired behavioural change. Even after the said interventions there were hardly any assessments to measure the outcome and to evaluate the strengths and weaknesses of the intervention.

Recently, World Health Organization has begun applying an approach known as COMBI (Communication-for-Behavioural-Impact) in the design and implementation of behaviourally focused social mobilization and communication programmes for control of communicable diseases. They were implemented in a number of countries aiming at control and prevention of leprosy, lymphatic filariasis, tuberculosis, dengue fever, and malaria. It is an approach well suited for achieving behavioural impact in the prevention, control and elimination of communicable diseases.

COMBI is a kind of social mobilization with a disease-oriented, behavioural focus. Adding behavioural focus to the mobilization model ensures that programmes – with usually very small budgets and human resources – get value for money in terms of actual behavioural results. In COMBI, there is an element of social marketing also. The combination of social mobilization to social marketing model ensures that the products, concepts of innovations will be widely diffused through various channels. The demand creation brought about by social mobilization ensures an accelerated process of diffusion. COMBI differs from traditional IEC approaches by moving programmes beyond awareness-raising to the achievement of precise behavioural objectives. COMBI makes a systematic link between these steps and those needed for prompting desired behavioural responses.

A COMBI mantra is: *Do nothing – produce no T-shirts, no posters, no leaflets, no banners etc. ….. do nothing until one has a precise fix on the behavioural outcome desired.* The community is intimately involved from the start through practical, participatory research relating desired behaviours to expressed or perceived needs/wants/desires. This research also involves listening to people and learning about their perceptions and grasp of the offered behaviour, the factors that would constrain or facilitate adoption of the behaviour, and their sense of the costs (time, effort, money) in relation to their perception of value of the behaviour to their lives. COMBI consists of three programmatic phases; planning, implementation and monitoring, and evaluation. The three essential ingredients of COMBI approach are:

- Establishment of precise behavioural (not just knowledge change) objectives on the basis of thorough research.
- Integration of a judicious blend of communication actions appropriate to the various groups targeted and to the behavioural outcomes desired, all carefully coordinated and timed.
- Constant monitoring of progress towards the achievement of these behavioural objectives.

COMBI has a greater behavioural impact and will yield more results out of the budget. Success stories of COMBI

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

05th - 11th February 2005 (6th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 GM=1	00	00	00	00	00	00	01 RP=1	02	02	12	15	-20.0%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	01 ML=1	00	01 MN=1	00	00	00	00	02	01	05	11	-54.5%
Tetanus	00	00	01 HB=1	00	00	00	00	00	01	00	05	08	-37.5%
Whooping Cough	00	00	00	00	00	00	00	01 KG=1	01	00	11	11	00.0%
Tuberculosis	25	75	00	18	27	18	21	26	210	26	1243	608	+104.4%

Table 2: Diseases under Special Surveillance

05th - 11th February 2005 (6th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	28	01	03	01	06	05	02	07	53	55	495	1053	-53.0%
Encephalitis	00	00	00	00	00	00	01 MO=1	02 RP=2	03	03	08	16	-50.0%
Human Rabies	00	00	00	00	00	00	00	00	00	02	08	09	-11.1%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :
Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.
DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

will attract more funding for the control activities. COMBI also measure the impact, motivates people and it is simply 'good management.'

This article will be continued to the next issue with a discussion on steps of COMBI planning.

Source: Parks W and Lloyd L. Planning social mobilization and communication for dengue fever prevention and control. . World Health Organization, Geneva. 2004.

Mobilizing for Action. Communication-for-Behavioural-Impact (COMBI). Mediterranean Centre for Vulnerability Reduction. World Health Organization 2003. http://www.comminit.com/pdf/Combi4-pager_Nov_14.pdf Accessed: 16.03.2005

All public health and curative health staff and any other interested person including the general public are welcome to contact the Epidemiological Unit in matters related to disease outbreak and immunization. This can be done either by mail, e-mail, fax or by telephone depending on the urgency and the importance of the matter.

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Table 3: Selected notifiable diseases reported by Medical Officers of Health

05th - 11th February 2005 (6th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	14	176	01	36	00	00	00	09	00	08	02	07	00	01	01	14	**92**
Gampaha	13	103	04	27	00	01	00	06	04	08	06	12	00	00	02	13	**57**
Kalutara	01	15	08	37	00	00	01	07	00	00	03	09	00	00	01	06	**70**
Kandy	00	19	13	55	00	00	01	09	00	00	00	02	03	12	03	06	**64**
Matale	01	04	20	80	00	00	00	04	00	00	00	19	00	00	00	00	**75**
Nuwara Eliya	00	00	05	24	00	00	03	17	00	00	00	01	03	05	00	03	**86**
Galle	02	03	02	14	00	00	01	02	00	00	00	04	00	00	00	01	**63**
Hambantota	00	01	00	20	00	00	00	05	00	00	03	11	01	06	00	00	**90**
Matara	01	06	01	14	00	00	00	02	00	04	04	11	00	07	00	01	**36**
Jaffna	00	01	04	20	00	00	08	69	00	02	00	00	14	43	02	15	**63**
Kilinochchi	00	00	00	00	00	00	00	00	00	02	00	00	00	00	00	00	**00**
Mannar	00	00	00	02	00	00	01	12	00	25	00	00	00	00	00	01	**83**
Vavuniya	00	12	00	16	00	01	07	82	00	00	00	00	00	00	01	01	**75**
Mullaitivu	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	**00**
Batticaloa	00	00	00	05	00	01	00	01	00	00	00	01	00	00	06	37	**71**
Ampara	00	01	00	13	00	00	00	01	00	00	00	01	00	00	00	01	**14**
Trincomalee	00	10	01	39	00	00	01	01	00	05	02	05	00	00	04	20	**33**
Kurunegala	01	31	05	61	00	00	01	09	00	00	00	05	02	05	01	10	**65**
Puttalam	05	48	00	09	00	00	00	12	00	00	00	01	00	00	00	02	**67**
Anuradhapura	02	15	01	27	00	01	00	06	00	00	00	26	01	02	01	15	**58**
Polonnaruwa	03	12	01	05	00	00	00	10	00	00	00	04	00	00	00	03	**57**
Badulla	02	04	18	102	00	00	06	19	00	04	03	12	04	08	02	23	**80**
Monaragala	00	01	01	26	01	01	01	04	00	00	09	34	01	11	03	13	**100**
Ratnapura	03	19	08	84	02	03	04	60	00	00	04	10	00	01	00	03	**60**
Kegalle	04	13	08	71	00	00	02	03	00	01	00	04	03	04	00	03	**80**
Kalmunai	01	01	00	00	00	00	00	00	00	00	00	00	00	00	00	03	**40**
SRI LANKA	**53**	**495**	**101**	**787**	**03**	**08**	**37**	**350**	**04**	**59**	**36**	**179**	**32**	**105**	**27**	**194**	**64**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 19th February 2005 :Total number of reporting units = 270.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WER SRI LANKA - 2005

Vol. 32 No. 08 **19th - 25th February 2005**

COMBI in dengue control - Part II

Communication for behavioural impact (COMBI) is a novel approach in the design and implementation of behaviourally focused social mobilization and communication programme for control of communicable diseases. In the last issue of Weekly Epidemiological Report (WER), an overview of COMBI in dengue control is given. COMBI consists of three programmatic phases namely planning; implementation and monitoring; and evaluation. With due recognition of its importance, in this issue of WER we discuss about how to plan COMBI in a dengue control programme.

COMBI planning can be divided into 15 steps:

1. **Assemble a multidisciplinary planning team**

The interest is in a multidisciplinary approach to planning social mobilization and communication. An example for a multidisciplinary team is the intersectoral planning group with other Ministries and Departments such as Water and Drainage, Education, Urban Development, Samurdhi, Local Government, as well as community groups and NGOs. These intersectoral groups are to oversee all components of a programme: surveillance, social mobilization, communication, clinical services, emergency response, and so on.

2. State preliminary behavioural objectives

This will be depending on the existing knowledge such as: whose behaviour needs to change? What do you want to help them to do? Why aren't they doing it now? How can you best influence and support those behaviours? What are the barriers?

It is important to list all relevant behavioural objectives not to miss anything important. These can be prioritized or discarded accordingly in the latter steps of planning.

3. Plan and conduct formative research

For effective social mobilization and communication, research on both behavioural and programme environments is essential . Questions that should explore during planning of formative research include: what information do need to make key programmatic decisions, what information already exists, what need to collect, what's the best method for obtaining them. In the behavioural environment research, one should look in to factors such as - among whom, and what behaviours are deficient to achieve a dengue free environment, how can this gap be narrowed. In the programme environment research, one should analyse the strengths, weaknesses, opportunities and threats (SWOT) of the programme.

4. **Invite feedback on formative research**

If programme planners and decision-makers are not involved in developing recommendations it is unlikely that research findings will turn in to practice. Therefore, it is important to present research findings to relevant authorities, to other experts in the field and also to the general public inviting them to comment. Seminars, personal communication or dissemination of information by print and electronic media will be useful.

5. Analyse, prioritize, and finalize behavioural objectives

Depending on the formative research results previously set behavioural objectives had to be prioritized. This should be done carefully and

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should spend adequate time before arriving at a final decision. Rather than too many behavioural objectives, targeting a few that are simple and cheap and preferably fun to put into practice will be more successful at the end. Choose no more than three behavioural objectives at a time. For example, if entomological findings show that one or two key containers are responsible for *Aedis* mosquito breeding, focussing on the correct management of these containers are more productive than trying to manage a whole list of possible breeding places.

It is also important to clearly identify the target audience for each behavioural objective. A detailed description of the behaviour should be stated with a measurable impact assessment. For example, "Within one year from the start of the programme, to increase the percentage of tyre traders in the … MOH area, who store discarded tyres under dry conditions, from 07% to 30%."

6. Segment target groups

Segment is a subset of the larger population that shares key characteristics. This helps to address the needs of these smaller segments efficiently rather targeting a larger population. It is also important when working under resource constraints. Segments can be identified by the age, sex, occupation, literacy level, level of knowledge, etc of the target population. Another way to consider target groups is to segment by primary and secondary audiences. For example, school children will be the primary audience if the behavioural change is expected among them. Secondary audiences are those who can support communication with the primary audience such as, teachers, principals, school clubs etc.

7. Develop your strategy

The next step is to work out strategies that will be used to achieve and sustain these results. A strategy is the broad approach that a programme takes to achieve its behavioural objectives. Strategies are made up of specific social mobilization and communication activities that on their own or in combination lead to achievement of the objectives. Strategy development should be creative to attract the target audience. A blend of communication actions should be used. Interventions should be implemented to coincide with local calendar - for example, shramadana campaigns would be more successful during weekends or holidays where people are at home.

8. Pre-test behaviours, messages, and materials

There is a cost behind every intervention and failures waste energy and time. This can be avoided by pre-testing. If new products are designed, for example, mosquito proof water storage containers, they have to be tested for efficacy, their acceptance by the community, and possible difficulties for implementation. Behavioural trials also have to be done to test new behaviours that will help to identify parts of a desired behaviour that are and are not readily adopted, to identify material or behavioural barriers to the adoption of the new behaviour, to identify what works best to reinforce learning of the new behaviour, and to refine communication to reinforce the desired behaviour. Materials and messages also should be pre-tested to identify clear, compelling messages and also to identify any unintended/ misinterpreted messages.

9. Establish a monitoring system

Monitoring is a continuous process in contrast to the evaluation, which is periodic. Both monitoring the behavioural impact and evaluating the process is necessary.

10. Strengthen staff skills

Empowering health care personnel in decision making is needed for the long-term sustainability of social mobilization and communication. Therefore opportunities should be provided for health staff, volunteers and other activists to train on techniques of social mobilization and communication.

11. Set up systems to manage and share information

Dengue programmes should be able to learn and change as and when it is needed. For this it should be armed with information management systems that enable rapid understanding of trends and developments affecting the behaviour of target groups. Such an information system would include carefully filed or electronically stored data on target groups and programme partners, drawing from formative research pretesting and monitoring. This information should also be shared with other stakeholders of dengue programmes.

12 Structure your programme

Existing organizational structure may not be adequate to implement behavioural interventions. Changes such as, forming multidisciplinary teams and intersectoral committees may be necessary. Organizational changes may also be necessary to train, mobilize and supervise field workforce, to establish information flow from bottom to top and to establish a feedback mechanism.

13 Write a strategic implementation plan

This is the most important tool for managing the implementation of the social mobilization and communication strategies. An ideal strategic implementation plan should include three basic sections. An **introduction** describing the context of the programme and the behavioural challenges it faces, a section providing an overview of the **strategic approach.** And a more detailed **implementation plan** of the specific activities, monitoring and evaluation methods, management structures, and budget. Within the third section, there should be a detailed work plan that acts as a template of activity schedules and schemes to coordinate different strategies. This can be used to monitor progress and should indicate the responsibilities of the various stakeholders. A strategic implementation plan serves as a record of the pro-

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

12th - 18th February 2005 (7th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	02 CB=1KL=1	00	00	00	02 KR=1PU=1	00	00	00	04	03	16	18	-11.1%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	00	01 MT=1	11 TR=11	00	00	00	01 KG=1	13	01	18	12	+50.0%
Tetanus	00	01 KD=1	00	00	00	00	00	00	01	01	06	09	-33.3%
Whooping Cough	01 CB=1	00	00	00	00	00	00	00	01	01	12	12	00.0%
Tuberculosis	20	08	60	00	15	00	18	00	121	296	1364	904	+50.9%

Table 2: Diseases under Special Surveillance

12th - 18th February 2005 (7th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	19	00	02	06	05	01	02	02	37	145	555	1219	-54.5%
Encephalitis	00	00	00	00	00	00	00	00	00	03	10	19	-47.4%
Human Rabies	00	00	00	00	00	01 AP=1	00	00	01	00	10	09	+11.1%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Monaragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

gramme's objectives and strategies, which can be referred and altered as necessary. The plan should be discussed and debated by multidisciplinary planning team and by other stakeholders.

14 Determine your budget

Preparing a budget would be very desirable and helpful in order to properly plan and implement activities.

15 Conduct a pilot test and revise your strategic implementation plan

Pilot testing ensures that the chosen strategies have no obvious major deficiencies. It also helps in fine tuning possible approaches so that they speak to target audiences in the most effective ways.

Many strategies can contribute to behavioural results. However, no strategy can be implemented in a coordinated and thus effective manner without careful organization. Someone has to communicate the right thing, in the right way, at the right time, to the right people, with the right effect. Planning may be tedious and worrying. However, as a responsible official to the community, one should take it seriously and the importance of achieving and sustaining behavioural impact. At the same time one should believe very strongly and be able to convince others of the need to systematically think through the major steps in planning social mobilization and communication for behavioural impact.

Source: Parks W and Lloyd L. Planning social mobilization and communication for dengue fever prevention and control. . World Health Organization, Geneva. 2004.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

12th - 18th February 2005 (7th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	10	186	02	38	00	00	00	09	22	30	01	08	00	01	03	17	**92**
Gampaha	05	120	04	35	00	01	00	06	00	08	01	16	00	00	00	13	**50**
Kalutara	04	21	12	49	00	00	00	07	00	00	02	11	00	00	00	07	**80**
Kandy	00	20	12	68	00	00	02	11	01	01	02	04	05	17	01	07	**73**
Matale	00	04	03	83	00	00	01	05	00	00	00	19	00	00	01	01	**50**
Nuwara Eliya	00	00	02	26	00	00	03	20	02	02	00	01	04	09	01	04	**86**
Galle	02	05	06	20	00	00	01	03	00	00	00	04	00	00	00	01	**81**
Hambantota	00	01	01	21	00	00	00	05	15	15	00	11	00	06	00	00	**100**
Matara	00	07	01	15	00	00	01	04	00	04	01	12	02	10	00	02	**29**
Jaffna	00	01	02	22	00	00	02	75	03	05	00	00	03	46	01	16	**50**
Kilinochchi	00	00	00	00	00	00	00	00	00	02	00	00	00	00	00	00	**25**
Mannar	00	00	00	02	00	00	00	12	00	25	00	00	00	00	01	02	**67**
Vavuniya	00	13	02	18	00	01	07	89	01	01	00	00	00	00	01	02	**100**
Mullaitivu	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	**00**
Batticaloa	00	00	01	06	00	01	00	01	00	00	00	01	00	00	03	40	**71**
Ampara	00	01	00	23	00	00	00	01	00	00	01	02	00	00	00	01	**43**
Trincomalee	06	20	16	57	00	00	04	06	00	05	00	05	00	00	07	28	**56**
Kurunegala	01	34	28	89	00	00	02	11	00	00	00	05	00	05	01	12	**82**
Puttalam	04	52	02	11	00	02	06	28	00	00	01	02	00	00	01	05	**78**
Anuradhapura	01	16	00	28	00	01	01	07	00	00	03	29	02	04	01	16	**74**
Polonnaruwa	00	12	03	08	00	00	02	12	00	00	02	06	00	00	02	05	**100**
Badulla	02	06	09	111	00	00	03	22	00	04	04	16	00	08	03	26	**73**
Monaragala	00	01	07	33	00	01	00	04	00	00	02	36	00	11	00	13	**50**
Ratnapura	01	20	02	91	00	03	00	69	00	00	00	10	00	01	00	03	**60**
Kegalle	01	14	03	74	00	00	00	03	00	01	01	06	01	05	00	03	**70**
Kalmunai	00	01	00	01	00	00	00	01	00	00	00	00	00	00	00	03	**20**
SRI LANKA	**37**	**555**	**118**	**929**	**00**	**10**	**35**	**411**	**44**	**103**	**21**	**204**	**17**	**123**	**27**	**227**	**67**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 26th February 2005 :Total number of reporting units = 270.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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Vol. 32 No. 09 **26th February - 04th March 2005**

WER SRI LANKA - 2005

Dengue control - Cuban experience

Cuba has its first dengue epidemic of modern times in 1977; transmission continued probably until 1981, and more than 500,000 mild cases were reported. A second dengue epidemic in 1981, was unusually severe and widespread. Of 344,203 cases, 10,312 were clinically classified as dengue haemorrhagic fever/dengue shock syndrome (DHF/DSS), and 158 persons died. In 2002, capital city Havana was struck with the third and the most recent dengue epidemic. The response of the Cuban health system to this epidemic and the maintenance of the rigor of surveillance thereafter are exemplary to other countries ravaged with dengue fever. It is especially an inspiration to developing countries since this exercise was a demonstration of optimal use of scarce resources.

To quash the epidemic the Cuban government initiated a 75 day intensive phase of integrated activities. The entire population of Havana was engaged in intensively co-ordinated work to remove all possible breeding sites for vector mosquitoes. Preventive actions among all sectors of the community, was undertaken every week.

The activities were dynamic, changing every week according to perceived risk factors and varying needs. In addition, there were major and comprehensive initiatives carried out by the health service. All doctors were involved in daily surveillance of their patients via house calls. They went house-to-house, looking for febrile cases. Any patient with fever was visited 3 times per day and was given bednets and supplementary high-protein food. If doctors observed one single 'alarm sign' the patient was sent directly to hospital. Throughout the outbreak, of the only three deaths occurred.

Some 11 000 people were called up and trained in control measures. Medical and university students and military trainees were all engaged in the campaign and instructed as necessary. A further, 18 000 people who work daily in Cuba's 'vectorial-brigades' were charged with working in the more difficult to reach places. These brigades were organised as small teams and consisted of both males and females.

The concept for control was based on eliminating breeding sites for the vector mosquitoes, using a 'periphery to centre' system. Every day, work was analysed and the campaign evaluated and modified according to the results. The basic plan was complmented by measures to spray each house with insecticide every 7 days, with 726 000 residential dwelling being treated in this way.

Commercial premises were also treated regularly including railway, bus stations, and hotels. The need for proper handling and recycling of household waste is identified. Consequently, the government purchased new vehicles and equipment to facilitate proper garbage and liquid waste disposal. New, easily covered water tanks were introduced and sold at highly-subsidised prices.

A significant consciousness raising and behaviour change was needed among the community at large for the campaign to be both successful and have long-term benefit in tackling dengue. Consequently, comprehensive health education measures were also introduced, backed by strong political will and commitment.

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A mission to Cuba

Recently, a team of delegates from Sri Lankan Government consisted of the Minister of Health, Nutrition and Uva Wellassa Development, the Deputy Director General of Health Services (Public Health) and the Chief Epidemiologist visited Republic of Cuba.

During this visit the delegation observed the Girón Polyclinic, one of 82 such clinics in the capital city of Havana serving its 2 million population. Polyclinics are responsible for a given group of families within their assigned district. These clinics are equipped with sophisticated medical facilities including endoscope, cardiac monitors, ultra sound scanners, x-ray and ECG. Polyclinics are also supported by a well equipped laboratory. Polyclinics also function as the centre for disease control and surveillance. The team also visited Pedro Kouri Tropical Medicine Institute and discussed about the epidemiology of selected diseases including dengue fever, leptospirosis, and rabies. It was learnt that in dengue control, Cuba use all possible methods, mainly relying on elimination of breeding places. Use of *Bacillus thuringiensis israelensis* (BTI) is mainly for water tanks; chemical control is applied during epidemics. There is a wide participation of the community in dengue control activities. Under the guidance and direction of health authorities, searching and elimination of potential mosquito breeding places in the community are done mainly by the community members themselves. Implementation of these activities are facilitated through community based organizations

Among the other places observed included the Labiofam – the company that produces BTI in Cuba. The team also visited a family doctor's house. It was more or less similar to a Central Dispensary in Sri Lanka but has a nurse in the doctor's team. In Cuba there are no Public Health Midwives similar to those doing field services in Sri Lanka. All primary care is provided by this team of a doctor and a nurse. There are more than 30 000 family doctors. Family doctor lives in the city block or village he/she serves. His house is called as 'consultorio.' Each family doctor covers an average of 700 – 800 population or 120 – 150 families. Family doctor maintains a register with a separate sheet for each family. In addition to his usual consultations at his 'consultorio,' the family doctor visits patients at their residences to provide follow up care. Among the services provided include, prenatal care, immunization, cancer screening, other risk factor screening, follow up for chronic conditions and care of psychosocial problems and stress.

Discussions with scientists and ministerial officials were mainly focussed on the possibilities of improving bilateral relationship especially in building up scientific link and developing scientific services in Sri Lanka and transferring technology to Sri Lanka, for example, mass production of locally developed BTI.

(Continued from page 1)

President Fidel Castro made three tours of the city and took part in three major national TV roundtables, during which the campaign was explained to the entire country. A series of "Hunting in the Home" public service announcements were also broadcast to help persuade every Havana resident to join in the activities.

The church was also involved to help everyone work for the good of the community. "The world is where we live" programme was introduced in schools, in which pupils (the leaders of the future) were encouraged to learn all about dengue and how to prevent it, in particular, being encouraged to visit houses in their communities to help check that all breeding sites were being eliminated.

Environmental management classes were introduced at the community level, where all those attending were instructed in methods of integrating and carrying out environmental control, vector control, diagnosis and surveillance.

It was at the family and household level that work was the most intensive. Families were instructed on how to check for breeding sites and signs of mosquitoes. In addition a male brigade worker visited every house once per week to carry out a thorough search for signs of mosquitoes and to continually educate householders. They recorded their visits, findings and actions, and also left a record permanently fixed to the rear of the dwelling's entrance door. Each house was then visited by a sprayman who fumigated the house with pyrethroid insecticide.

Finally, a female brigade worker revisited each house to check that the work had been done satisfactorily and to gather all the data which was then compiled at the district office level. This allowed detailed mapping of mosquitoes to be produced. The same intensive procedures were carried out for commercial premises, most especially tyre factories and depots.

Rivers, canals and water courses were also treated with biolarvicides and regularly monitored. In addition, scientists in Cuba have accelerated their efforts to combat the disease. The main focus of the scientific effort was the Institute Pedro Kouri (IPK) in Havana, a renowned centre of expertise which serves as a central training hub for infectious disease medics and scientific researchers from through out Latin America and beyond. The IPK also serves as the national reference centre for diagnosis of dengue and other communicable diseases. In the research laboratories, IPK scientists have already developed a rapid diagnostic ELISA kit. This easy-to-use kit, which allows early detection of people at risk, is now being used in Cuba and throughout the region where dengue is becoming a growing menace.

Early detection, development of an effective control strategy and intensive laboratory and field work orchestrated by the IPK played a crucial role in controlling the epidemic. Even after the dengue epidemic receded, the surveillance activities were not relaxed and continued in the same intense and frequency. During the epidemic, Cuban health system used every possible means of control from house to house search of mosquito breeding places, public education to chemical and biological control of mosquitoes and larvae. However, to keep the dengue threat under control Cuba is mainly relying on elimination of breeding places. The vectorial-brigade system is continuing in the activities of vector

(Continued on page 3)

Key health related indicators in Cuba

Total population (million)	11.2
Annual national health expenditure (% of the GDP)	6.4
Per capita total expenditure on health (US $)	121
Crude birth rate (per 1000 population)	12.2
Infant mortality rate (per 1000 live births)	6.3
Maternal mortality rate (per 100 000 live births)	39.5
Infections and parasitic disease mortality (% of all deaths)	1.0
Physicians (per 10 000 population)	54.6
Nurses (per 10 000 population)	69.1

Table 1: Vaccine-preventable diseases & AFP

19th - 25th February 2005 (8th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 GM=1	00	00	00	00	00	00	01 RP=1	02	05	18	23	-21.7%
Diphtheria	00	01 KD=1	00	00	00	00	00	00	01	00	02	01	+100.0%
Measles	00	00	00	00	00	00	00	01 KG=1	01	00	19	13	+46.2%
Tetanus	00	00	00	00	00	00	00	00	00	02	06	11	-45.5%
Whooping Cough	01 GM=1	00	00	00	00	00	00	00	01	01	13	13	00.0%
Tuberculosis	117	31	09	44	27	24	00	00	252	260	1616	1164	+38.8%

Table 2: Diseases under Special Surveillance

19th - 25th February 2005 (8th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	31	02	01	05	03	00	00	00	42	75	613	1339	-54.2%
Encephalitis	00	01 ML=1	00	00	00	00	00	01 RP=1	02	02	14	23	-39.1%
Human Rabies	00	00	00	00	00	00	00	00	00	01	10	12	-16.7%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

surveillance, elimination of breeding places, and public education for a behavioural change. Cuban family doctors do home visits to identify and treat fever patients. Their effort with minimum facilities and resources – responding promptly, walking house to house and delivering health care at the doorstep is very impressive.

Erratum:

In WER Sri Lanka, Vol. 32, No 06, the Table 1 in page 2 should be corrected as follows:

72-84 months old children - DT/OPV 5: Card: 225 (75.0%) and Card + History: 271 (90.3%).

Table 3: Selected notifiable diseases reported by Medical Officers of Health

19th - 25th February 2005 (8th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	16	204	06	44	00	00	00	10	00	30	01	09	00	01	02	19	100
Gampaha	12	140	03	40	00	01	00	06	00	11	03	23	00	00	00	14	86
Kalutara	03	25	07	56	00	00	01	08	00	00	05	18	00	00	02	09	90
Kandy	00	20	05	73	00	00	00	11	00	01	00	04	00	17	00	07	64
Matale	01	06	04	92	01	01	03	08	06	06	01	20	00	00	00	01	83
Nuwara Eliya	01	01	05	31	00	00	03	23	00	02	00	01	00	09	01	05	86
Galle	00	05	02	22	00	00	02	05	00	00	02	06	00	00	00	01	75
Hambantota	00	01	01	22	00	00	00	05	00	15	03	14	00	06	00	00	90
Matara	01	09	02	24	00	01	02	08	03	07	03	18	00	22	00	02	43
Jaffna	00	02	00	24	00	00	08	91	04	09	00	00	06	55	01	17	75
Kilinochchi	00	00	00	00	00	00	00	00	00	02	00	00	00	00	00	00	00
Mannar	00	00	00	02	00	00	01	13	00	25	00	00	00	00	00	02	83
Vavuniya	00	13	02	20	00	01	06	95	00	01	00	00	00	00	00	02	75
Mullaitivu	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
Batticaloa	00	00	01	07	00	01	00	01	00	00	00	01	00	00	05	46	86
Ampara	00	01	00	23	00	00	00	01	00	00	00	02	00	00	00	01	29
Trincomalee	05	25	06	63	00	00	00	06	03	08	00	05	00	00	05	33	56
Kurunegala	01	35	07	97	00	00	05	16	00	00	00	05	00	05	03	17	82
Puttalam	02	54	00	12	00	02	00	28	00	00	00	02	00	00	00	05	67
Anuradhapura	00	16	04	32	00	01	01	08	00	00	04	33	00	04	02	18	84
Polonnaruwa	00	12	00	08	00	00	00	12	00	00	00	06	00	00	01	06	71
Badulla	00	06	08	120	00	00	02	25	00	04	03	20	01	10	08	34	80
Monaragala	00	01	02	35	00	01	02	07	00	00	06	42	01	12	00	14	80
Ratnapura	00	21	09	103	01	05	25	95	00	01	01	11	00	01	01	04	80
Kegalle	00	14	02	79	00	00	00	03	00	02	03	10	00	05	01	05	100
Kalmunai	00	02	02	03	00	00	01	04	00	00	00	00	00	00	01	05	30
SRI LANKA	**42**	**613**	**78**	**1032**	**02**	**14**	**62**	**489**	**16**	**124**	**35**	**250**	**08**	**147**	**35**	**267**	**74**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 19th February 2005 :Total number of reporting units = 270.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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Vol. 32 No. 10 05th - 11th March 2005

WER SRI LANKA - 2005

Adverse events following JE immunization

Japanese encephalitis (JE) is a mosquito borne zoonotic disease with natural reservoirs and cannot be eliminated. The vast majority of infections are unapparent and only one in 25 - 1000 infections result in clinical illness. Although the Japanese Encephalitis (JE) virus was isolated in Sri Lanka in 1968, the first major out break was reported in 1985/86 in Anuradhapura and Polonnaruwa districts (385 cases; 64 deaths). The largest out break was in 1987/88 with 812 cases and 192 deaths. The case fatality rate was 23.6%.

Although a declining incidence of JE has been observed in Asia because of reduced transmission by agricultural approaches and vaccination, the most important control measure now, and in the future, is vaccination of humans against JE. A cheap live attenuated vaccine is used almost exclusively in China and parts of Korea. The vaccine seems to be highly efficient and only a few adverse events have been observed. Evidence is emerging from China that after a single dose of this vaccine before completion the age of one year produces immunity for a considerable period of time. The inactivated vaccine produced from infected mouse-brain-derived tissue, is the only commercially available vaccine. This is expensive and requires three doses to achieve protective efficacy and requires further booster doses to maintain immunity.

Inactivated JE vaccination is associated with a moderate frequency of local and mild systemic side effects. Tenderness, redness, swelling and other local effects have been reported in about 20% of vaccinees. Systemic side effects - fever, headache, malaise, rash and other reactions such as chills, dizziness, myalgia, nausea, vomiting, and abdominal pain have been reported in about 10% of vaccinees. The pattern of adverse reactions to JE vaccine has been changed over time.

An important feature of these reactions has been the interval between vaccination and onset of symptoms. Reactions after a first vaccine dose occurred after a median of 12 hours following vaccination; 88% of reactions occurred within 3 days. The interval between administration of a second dose and onset of symptoms generally was longer (median 3 days) and possibly as long as two weeks. Reactions have occurred after a second or third dose when preceding doses were received uneventfully.

The immunization program against JE in Sri Lanka was commenced in Anuradhapura, Polonnaruwa and Puttalam districts in 1988. Later, it was extended to include several other districts, based on epidemiological data. Anuradhapura, Polonnaruwa, Ampara, Kalmunai, Batticaloa, Trincomalee, Kurunegala, Puttalam, Gampaha, Colombo, Kalutara, Galle, Matara and Hambantota districts are included in the JE immunization programme. In addition, since 2003 Children of 1-3 years of age living in Ratnapura and Jaffna districts were also immunized with JE vaccine following the outbreak in the Ratnapura district in 2002.

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Table 2: Adverse event following JE immunization 1998 - 2004

	1998	1999	2000	2001	2002	2003	2004
No. of children with adverse events reported	40	79	87	36	131	880	414
Incidence rate (per 100 000 immunizations)	5.1	9.9	8.3	4.6	14.6	123.9	58.7

Table 3: Types of adverse events reported following JE immunization

Adverse event	2003			2004		
	No.	%	Incidence rate	No.	%	Incidence rate
Allergic reactions including urticaria, rash, vomiting and oedema	634	72.0	89.2	234	56.5	33.1
Fever	120	13.6	16.8	69	16.6	9.7
Local reactions	24	2.72	3.3	09	2.1	1.2
Abscess formation	00	0.0	0.0	10	2.4	1.4
Vomiting/diarrhoea	15	1.7	2.1	00	0.0	0.0
Seizures with/without fever including focal fits	30	3.4	4.2	30	7.2	4.2
Excessive crying	04	0.4	0.5	03	0.7	0.4
Red eye	03	0.3	0.4	00	0.0	0.0
Arthralgia	02	0.2	0.2	09	2.1	1.2
Meningitis	00	0.0	0.0	01	0.0	0.1
Encephalopathy	02	0.2	0.2	00	0.2	0.0
Encephalitis	01	0.1	0.1	00	0.0	0.0
Fainting attack	01	0.1	0.1	00	0.0	0.0
Haematemesis/haematuria	01	0.1	0.1	00	0.0	0.0
Anaphylactic shock	01	0.1	0.1	00	0.0	0.0
Death	01*	0.1	0.1	00	0.0	0.0

* Unconfirmed evidence

Grappling adverse events following JE immunization - what can Health Care Worker do in the clinic

If the child came for subsequent vaccines,

- Explore whether the child had any symptoms or signs suggestive of adverse events.
- If yes, decision on immunization should be taken by a Medical Officer. If it is decided to immunize the child it should be carried out in a setting where facilities for management of anaphylaxis is available.

When there were no adverse events for previous JE vaccines or came for the first dose:

- Inform mother regarding the possibility of adverse events.
- Remind that adverse events can occur weeks later.
- Reassure mother that most of these adverse events are temporary and self limiting.

In case of any adverse event

- Advice mother to consult a medical officer immediately and also advice them to inform the Midwife of the area.

Following immunization

- Observe the child for at least for half an hour before discharging from the clinic.

Following the introduction of the immunization programme, fewer JE cases were reported from areas where several out breaks occurred in the past. With this reduction of the disease burden adverse events following immunization causes concern. Therefore, a surveillance mechanism for adverse events following immunization (AEFI) has been established. This ensures regular reporting of AEFI to the regional and central levels and also case based proper investigation of all adverse events following JE immunization.

In 2003, the number of adverse events following JE immunization reported to the Epidemiological Unit was significantly higher (572%) than in the previous years (Table 2). Although there is a reduction of adverse events reported in 2004, it is still high when compared with 2002.

In 2003 and 2004, the majority of adverse events reported were systemic in nature and consist of mild to moderate allergic reactions and fever. More severe forms of adverse events namely, encephalopathy, encephalitis and anaphylaxis were very few and is below 0.2 per 100 000 immunizations (Table 3). One death temporally related to JE immunization was reported from Jaffna District in 2003. JE vaccine had been administered a few days prior to the death. The evidence is unconfirmed since an autopsy was not performed.

Comparatively high number of systemic allergic nature of adverse events suggest that the presence of excessive amounts of allergens at least in some batches of vaccines used in the JE immunization programme in 2003 and 2004. Similar observations on JE vaccine in other countries suggest that potentially allergenic components may be produced intermittently or remain in variable amounts in the finished vaccine.

Since 1988, different manufacturers had supplied JE vaccines to the Government of Sri Lanka. In 1988, 1991 and 1992, the Hyolim Limited and in 1995 and 1996 the Green Cross, Korea supplied JE vaccines. From 1997 to 2001 the JE vaccine supplier was Denka Seiken, Japan. Since 2002, the Thai-

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

26th February - 04th March 2005 (9th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 GM=1	01 KD=1	00	03 JF=1MU=1 KM=1	01 KR=1	00	00	00	06	02	24	25	-04.0%
Diphtheria	00	00	00	00	00	00	00	00	00	00	02	01	+100.0%
Measles	00	00	00	01 TR=1	00	00	00	00	01	00	20	14	+42.9%
Tetanus	00	00	00	00	00	00	00	00	00	01	06	12	-50.0%
Whooping Cough	00	00	00	00	00	00	00	01 KG=1	01	01	15	14	+07.1%
Tuberculosis	198	58	08	53	27	09	00	34	387	70	2003	1234	+62.3%

Table 2: Diseases under Special Surveillance

26th February - 04th March 2005 (9th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	24	03	04	00	02	02	00	01	36	147	656	1550	-57.7%
Encephalitis	00	00	00	00	00	00	00	01 RP=1	01	01	15	24	-37.5%
Human Rabies	00	00	00	00	00	00	00	00	00	03	12	16	-25.0%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

land Government owned Government Pharmaceutical Organization (GPO) is the JE vaccine supplier. The higher incidence of adverse events is reported following administration of JE vaccines supplied by GPO. Since 2002, GPO is the only inactivated JE vaccine supplier. Other two known companies that produce the inactivated JE vaccine – Green Cross and Denka Seiken had not participated in competitive bidding to supply JE vaccines to Sri Lanka.

Under the circumstances Sri Lanka has no alternative but continue to use this only available vaccine cautiously until an alternative better quality vaccine is found.

All public health and curative health staff and any other interested person including the general public are welcome to contact the Epidemiological Unit in matters related to disease outbreak and immunization. This can be done either by mail, e-mail, fax or by telephone depending on the urgency and the importance of the matter.

Telephone: 011 2695112, 011 2681548, 011 4740492

Epidemiologist: 011 2232827, 0773166299 (To contact during weekends, public holidays and out of office hours)

Fax: 011 2696583

E-mail: chepid@sltnet.lk

Epidemiological Unit

231, de Saram Place, Colombo 10

Table 3: Selected notifiable diseases reported by Medical Officers of Health

26th February - 04th March 2005 (9th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	14	218	00	44	00	00	01	11	17	47	00	09	00	01	02	21	**62**
Gampaha	06	151	02	44	00	01	00	06	00	11	02	25	00	00	01	15	**79**
Kalutara	04	29	04	60	00	00	01	09	00	00	03	21	00	00	02	11	**70**
Kandy	02	23	12	85	00	00	00	11	04	05	01	05	04	21	01	08	**82**
Matale	00	06	07	99	00	01	00	08	00	06	00	20	00	00	00	01	**58**
Nuwara Eliya	01	02	03	34	00	00	06	29	00	02	01	02	00	09	00	05	**86**
Galle	00	05	00	23	00	00	00	06	00	02	00	07	01	01	00	01	**81**
Hambantota	03	04	02	24	00	00	00	05	00	15	05	19	02	08	02	02	**90**
Matara	01	10	02	28	00	01	00	08	00	07	16	36	01	23	01	03	**50**
Jaffna	00	02	01	25	00	00	01	92	00	09	00	00	03	58	01	18	**38**
Kilinochchi	00	00	00	00	00	00	00	00	00	02	00	00	00	00	00	00	**00**
Mannar	00	00	00	02	00	00	00	13	00	25	00	00	00	00	00	02	**83**
Vavuniya	00	13	02	22	00	01	13	108	00	01	01	01	00	00	01	03	**50**
Mullaitivu	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	**00**
Batticaloa	00	00	00	07	00	01	00	01	00	00	00	01	01	01	02	50	**71**
Ampara	00	01	00	23	00	00	00	01	00	00	02	04	00	00	00	01	**29**
Trincomalee	00	25	01	73	00	00	00	06	00	08	00	05	00	00	00	33	**44**
Kurunegala	01	37	03	102	00	00	00	16	00	00	00	05	00	05	00	17	**65**
Puttalam	01	55	02	14	00	02	00	28	00	00	00	02	00	00	00	06	**67**
Anuradhapura	02	18	01	34	00	01	01	09	17	17	02	35	01	05	01	19	**74**
Polonnaruwa	00	12	00	08	00	00	01	14	00	00	00	07	00	00	01	07	**71**
Badulla	00	06	20	141	00	00	04	31	00	04	00	21	00	10	00	35	**60**
Monaragala	00	01	02	37	00	01	01	08	00	00	08	50	02	14	01	15	**60**
Ratnapura	00	21	04	109	01	06	01	96	00	01	01	12	00	01	00	04	**47**
Kegalle	01	15	06	85	00	00	01	04	00	02	02	12	01	06	02	07	**70**
Kalmunai	00	02	02	05	00	00	01	05	00	00	00	00	00	00	00	05	**30**
SRI LANKA	**36**	**656**	**76**	**1128**	**01**	**15**	**32**	**525**	**38**	**164**	**44**	**299**	**16**	**163**	**18**	**289**	**63**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 12th March 2005 :Total number of reporting units = 270.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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ON STATE SERVICE

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WER SRI LANKA - 2005

Vol. 32 No. 11 **12th - 18th March 2005**

Red eye - management at primary care level

One of the most common eye problems to present to health care settings is acute red eye(s). While the more serious causes of red eye need prompt recognition and management by an eye specialist, in many cases red eye can be managed at the first point of health care (primary level). Knowing about red eye by the primary health care worker is important in several aspects. This will be able to differentiate the various causes of red eye and providing first-aid will minimize or prevent permanent damages to eyes. The primary health care worker should be competent enough to help communities preventing and controlling conjunctivitis of epidemic nature.

The commonest cause of red eye is conjunctivitis. Other conditions include trachoma, corneal ulcer, acute iritis, acute glaucoma and injury (or trauma). Red eye may also be due to the use of harmful traditional medicines for other eye conditions.

Conjunctivitis

Conjunctiva is a thin, transparent mucous membrane, which lines the inner surface of the eyelids and covers the sclera. The conjunctiva contains glands which produce secretions that help to keep the eyes moist, and antibodies, which reduce infection.

Conjunctivitis affecting all ages

This is the most common cause of red eye. It is usually painless and characterized by purulent or watery discharge. There are different types of conjunctivitis: bacterial conjunctivitis (e.g. *Staphylococcus* or *Streptococcus*); viral conjunctivitis (e.g. herpes simplex); and allergic conjunctivitis (e.g. due to smoke, cosmetics, medicines, etc). The signs vary depending on the cause.

Conjunctivitis of the newborn

Any eye infection in the first 28 days of life is known as neonatal conjunctivitis or opthalmia neonatorum.

All babies should have their eyes cleaned immediately after birth. During the antenatal care all mothers with vaginal infections should be treated.

Viral conjunctivitis

Several different viruses can cause conjunctivitis. Some such as entero- and adenoviruses, can spread rapidly through communities leading to epidemics of conjunctivitis. Some viral infections primarily cause skin infections (molluscum contagiosum, herpes infection), and the eye can be infected if the eyelids are involved.

The epidemic form of conjunctivitis that caused by entero- or adenoviruses almost always affects both eyes. The patient may complain of a foreign body sensation, with watering, discharge, redness, and swelling of the lids. They may also complain of the eyes being sensitive to light, with blurred vision. The eyes appear red, with discharge, but the cornea and pupil are usually normal. In severe cases there may be small haemorrhages in the conjunctiva. The patient may also complain of upper respiratory tract symptoms and other generalized symptoms (sore throat, fever and headache). The eye infection lasts 7-14 days. The condition is very contagious: health workers should wash their hands after examining a patient and disinfect the instruments they have used.

There is no specific treatment for viral conjunctivitis, and the condition gets better on its own.

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Cleaning the eyes of discharge regularly will allow the eyes to settle in a few days. Antibiotic eye drops prevent secondary bacterial infections. Topical steroids may be harmful and should never use without expert advice. The patient should be told that the condition is very infectious, that they should not share face towels, and should wash their hands regularly. The patient should also be advised not to use traditional remedies.

Special treatment is required in some conditions. for example, the removal of skin lesions in Molluscum contagiosum conjunctivitis and antiviral drops or ointments for herpes simplex blepharo-conjunctivitis.

Bacterial conjunctivitis

Acute conjunctivitis

Conjunctivitis due to bacteria differs is more likely to affect only one eye and the amount of discharge and lid swelling is usually greater than in viral conjunctivitis. The patient complains of irritation, a foreign body sensation and the eyelids are stuck together in the mornings. Topical antibiotics are needed in treatment. Regular cleaning of the eye improves the condition remarkably.

Conjunctivitis due to *Gonococcus*

Newborn babies may acquire infection during pregnancy. Adults can acquire the infection during sexual activities. Infection with *Gonococcus* should be suspected in any age group if the eyelids are very swollen, if the discharge is thick and profuse, and if the cornea is ulcerated or perforated. Prompt treatment is needed since this is a sight threatening condition. If a newborn baby has conjunctivitis and *Gonococcus* is suspected the mother should take her baby to an eye clinic immediately for treatment. She also should be treated as well as her husband/partner.

Chronic bacterial conjunctivitis

Bacterial infection of the eyelid margins can lead to chronic conjunctivitis. The patient complains of sore eyelids and sore eyes with little discharge. On examination, the eyelid margins are thickened, slightly inflamed and crusty. The eyes themselves may like normal or slightly red. As the source of the conjunctivitis is infection of the eyelids, treatment is aimed at the eyelids and consists of an appropriate antibacterial eye ointment applied to the lid margins after cleaning the lid margins to remove the crusts.

Allergic conjunctivitis

There are two forms: an acute form and a chronic form.

Acute allergic conjunctivitis

The adult or child develops sudden and severe itching of the eyes and eyelids as a result of coming into contact with something the person is allergic to. The eyelids and conjunctiva become markedly swollen and there is profuse watering of the eyes, which usually do not become red. The condition gets better on its own very quickly. The person needs to try and find out what led to the reaction (e.g. eating certain food) and try to avoid this in the future. They should be told not to rub their eyes, as this makes the condition worse.

Chronic allergic conjunctivitis (vernal kerato-conjunctivitis; VKC)

VKC is a bilateral chronic inflammation of the conjunctiva. It is more common in young boys. The disease affects children between three to 16 years of age though it may appear earlier than that and continue into adulthood. In the majority of cases, symptoms resolve at puberty. Symptoms include intense itching, irritation, photophobia and burning. The itching is worse with exposure to wind, dust, bright light and hot weather. Some patients complain of a sticky, stringy mucous discharge. Corneal involvement leads to reduced vision.

These patients need long term treatment and the nature of treatment depends on the severity of the condition. Counselling of the patient stressing the chronic nature of the disease, the need for long term treatment with regular follow up even after symptoms become better, improve compliance of treatment. Primary health care worker can play a big role by ensuring patients are adhering to instructions received.

Chemical conjunctivitis

Many different substances put in the eyes can cause chemical reactions (e.g. traditional remedies, reaction to contents in eye drops). The findings are similar to that seen in viral conjunctivitis, and so the history is important.

The person should be told to stop instilling the substance that has caused the reaction. People should not instil anything in their eyes that has not been prescribed for them and they should throw away eye drops after the bottle has been open for one month or more.

Corneal ulcer

Corneal ulcers have many causes. They can be caused by infection – bacteria, fungus, virus or acanthamoeba or malnutrition as in measles/vitamin A deficiency, which occurs mainly in infants between the ages of six months and two years. Some causes are mainly unilateral whereas others like vitamin A deficiency are often bilateral.

The patient will complain of a red painful eye. The eyelids may be swollen, the conjunctiva is red around the cornea, the pupil is normal and the visual acuity is often reduced. There is often a grey spot or mark on the cornea. Corneal ulcer is a serious eye problem that should be referred immediately to an ophthalmologist.

Acute glaucoma

In acute glaucoma the pressure in the eye goes up very quickly. This causes a very painful red eye, with poor visual acuity. The cornea is hazy due to oedema and the pupil is large and does not become small when a bright light is shone into the eye. This is a very serious and painful disease. The

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

05th - 11th March 2005 (10th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	01 GL=1	00	00	00	00	00	01	01	25	26	-03.8%
Diphtheria	02 KL=1	00	00	00	00	00	00	00	02	00	02	01	+100.0%
Measles	00	00	00	00	00	00	00	00	00	00	20	11	+81.8%
Tetanus	00	00	00	00	00	00	00	00	00	00	07	12	-41.7%
Whooping Cough	00	00	00	00	00	00	00	01 KG=1	01	00	16	14	+14.3%
Tuberculosis	31	09	58	18	10	00	00	16	142	63	2145	1297	+65.4%

Table 2: Diseases under Special Surveillance

05th - 11th March 2005 (10th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	34	01	04	02	00	01	01	03	46	80	711	1666	-57.3%
Encephalitis	00	00	00	00	00	00	00	01 RP=1	01	00	16	24	-33.3%
Human Rabies	00	00	00	00	00	00	00	00	00	01	12	18	-33.3%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

patient must be referred immediately.

Traditional eye medicine

Some of the traditional eye medicine especially of those self medications could be very harmful. It is important to understand the reasons why people use traditional eye treatments, and not to judge them. There is widespread ignorance about the dangers of self-treatment for eye conditions. Many poor patients put off seeking help because of the negative attitudes of some health workers and also due to the direct and indirect cost behind treatment. Socio-cultural beliefs in evil spirits and witchcraft may lead some people to think that the best course of action is with spiritual rather than medical healers. If the distance to health facilities is long, patients may tend to seek help from the nearest source.

Injury (or trauma)

Traumatic injuries may cause irreversible damage to the eye leading to blindness. All eye injuries should be referred immediately for specialist care.

Source:

Community Eye Health Journal. Vol. 18: Issue 53. March 2005

Table 3: Selected notifiable diseases reported by Medical Officers of Health

05th - 11th March 2005 (10th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	20	240	01	45	00	00	01	12	00	47	03	14	00	01	03	24	**85**
Gampaha	12	164	01	45	00	01	03	09	00	11	02	27	00	00	01	16	**93**
Kalutara	02	32	06	70	00	00	04	14	00	00	04	26	00	00	00	11	**70**
Kandy	01	25	00	86	00	00	00	11	00	05	00	05	00	21	02	10	**64**
Matale	00	06	01	101	00	01	00	08	00	06	00	20	00	00	00	01	**50**
Nuwara Eliya	00	02	09	47	00	00	01	30	00	02	00	02	00	09	00	05	**86**
Galle	02	07	00	23	00	00	01	07	00	02	02	09	00	01	00	01	**63**
Hambantota	00	04	01	25	00	00	00	05	00	15	00	19	00	08	00	02	**100**
Matara	02	12	00	31	00	01	00	08	00	12	00	40	00	29	00	03	**36**
Jaffna	00	03	00	26	00	00	01	98	00	09	00	00	00	60	00	18	**13**
Kilinochchi	00	00	00	00	00	00	00	00	00	02	00	00	00	00	00	00	**25**
Mannar	00	00	02	04	00	00	01	14	00	25	00	00	00	00	00	02	**83**
Vavuniya	00	13	02	24	00	01	00	109	00	01	00	01	00	00	00	03	**75**
Mullaitivu	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	**00**
Batticaloa	00	00	00	07	00	01	00	01	00	00	00	01	00	01	01	52	**71**
Ampara	02	03	00	25	00	00	00	01	00	00	01	05	00	00	00	01	**57**
Trincomalee	00	25	01	78	00	00	00	06	00	08	00	05	01	01	00	36	**22**
Kurunegala	00	39	00	102	00	00	00	16	00	07	00	05	00	05	01	20	**65**
Puttalam	00	55	01	15	00	02	14	42	03	03	01	03	00	00	00	06	**67**
Anuradhapura	01	19	01	36	00	01	01	10	00	17	01	36	03	08	01	20	**58**
Polonnaruwa	00	12	03	11	00	00	00	16	01	01	00	07	00	00	00	07	**57**
Badulla	01	08	09	153	00	00	05	38	00	04	01	22	04	14	04	48	**67**
Monaragala	00	01	00	37	00	01	00	08	00	00	01	51	01	15	03	18	**70**
Ratnapura	03	24	10	120	01	07	04	106	08	09	00	12	01	03	03	07	**73**
Kegalle	00	15	08	101	00	00	03	07	00	02	01	14	00	06	00	08	**70**
Kalmunai	00	02	00	05	00	00	00	05	00	00	00	00	00	00	01	06	**50**
SRI LANKA	**46**	**711**	**56**	**1217**	**01**	**16**	**39**	**581**	**12**	**188**	**17**	**324**	**10**	**182**	**20**	**325**	**63**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 19th March 2005 :Total number of reporting units = 270.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WEEKLY EPIDEMIOLOGICAL REPORT
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Vol. 32 No. 12 19th - 25th March 2005

SRI LANKA - 2005

WER

Myocarditis outbreak in Badulla

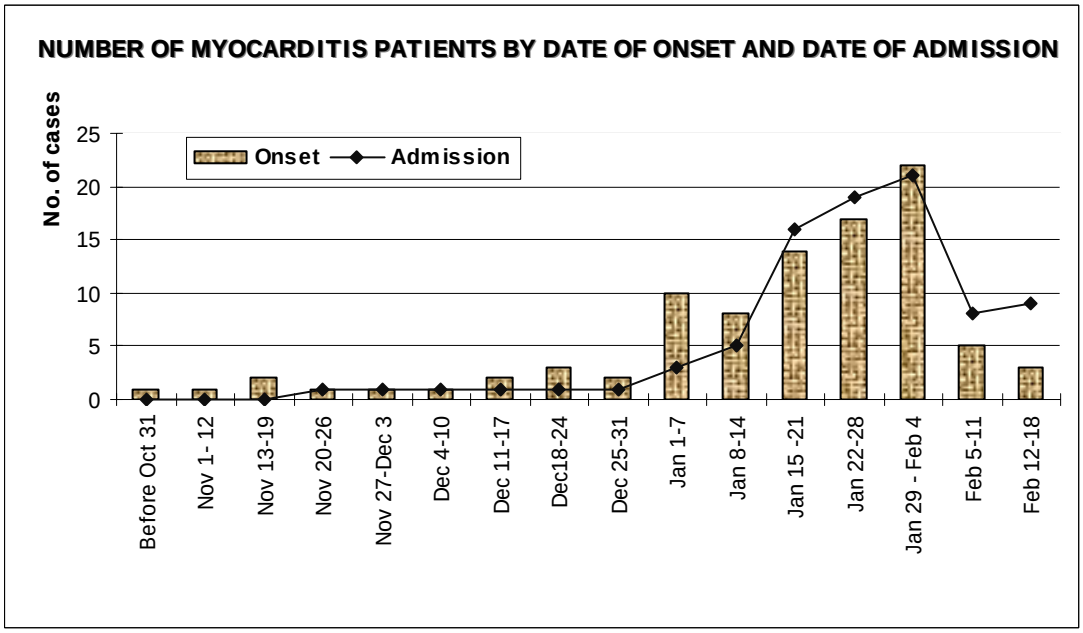
In the recent past in certain parts of the country there were several disease outbreaks presumably infective in origin. The suspected viral myocarditis outbreak that was reported in the Uva Province was one such outbreak with a wider attention gained from both health personnel and from the community.

On 31st January 2005, the Consultant Cardiologist, Badulla General Hospital (GH) informed the Epidemiological Unit that there is an unusual increase in the number of cases with suspected myocarditis since December 2004. By that time, according to the available information, there were a total of 58 cases of suspected cases of myocarditis. Over the next one month many similar cases were detected by the Consultant Cardiologist of the Badulla GH. There was unrest among the staff of the Badulla GH since some of them also suffered from similar illness.

Intense epidemiological investigations were carried out to identify the causative factor for this outbreak. This was backed by laboratory investigations carried out at departmental, university and private sector laboratories. A wider network of medical experts including Cardiologists, Physicians, Paediatricians, Epidemiologists, Bacteriologists, Virologists and also medical administrators were involved in many steps of the management of this outbreak. This was also supplemented by collaboration with international agencies such as World Health Organization and Centres for Disease Control, Atlanta.

At the time of the out break is reported, information available was not adequate to suggest any possible cause. A detailed field investigation was followed to collect data on cases and to col-

(Continued on page 2)



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lect blood, stool and nasal secretions samples from acute and convalescent cases for further investigation. Any epidemiological link was not observed among the cases investigated. A link with any primary infection was also not established. However, it was suggested that the present myocarditis is very unlikely to be caused by a highly infectious organism. Laboratory investigations carried out for influenza A and B, dengue, mycoplasma and adeno virus yielded no positive results except for two samples that was positive for dengue IgM. Gathered evidence suggested that this is a mild form of

Myocarditis .....

Myocarditis can be produced by a variety of different disorders, many of which are infectious. Viral infection is the most common cause with the most frequently implicated virus being Coxsackievirus B. Other viruses include adenovirus type 2, hepatitis C, cytomegalovirus and parvovirus B19. Dengue virus also rarely causes myocarditis. The clinical presentation of myocarditis varies considerably. In mild forms, there are few or no symptoms. In severe cases, patients may present with acute cardiac decompensation and progress to death. Heart failure, chest pain, arrhythmia, and dilated cardiomyopathy may or may not present in these patients. ECG and echocardiographic findings are not specific to myocarditis. At present the definitive diagnosis of myocarditis can be made only by endomyocardial biopsy. Evaluation studies showed that the sensitivity of this test can be very low and is mainly due to the focal and transient nature of the pathological changes. Considering the risk and benefits this is not recommended as a routine investigation.

GUIDELINES FOR THE PREVENTION AND CONTROL OF SUSPECTED MYOCARDITIS OUTBREAK IN HOSPITAL SETTING

Out Patients' Department (OPD)

- Overcrowding at OPD and clinics should be minimized. This can be achieved by minimizing the waiting time of patients.
- Designating a Medical Officer in the OPD to attend all patients with suspected myocarditis will ensure prompt attention to these patients. This also important since it facilitate effective execution of precautionary measures. These patients may be:
  - Those referred by General Practitioners or Physicians/ Cardiologists for admission with a suspected diagnosis of myocarditis.
  - Transferred patients from other hospitals with a suspected diagnosis.
  - Patients presenting to the OPD complaining of chest pain and/ or difficulty in breathing without an obvious alternative reason for symptoms.
- It is advisable that the Medical Officer (OPD) and his/her assisting health staff attending to these patients wear a mask.
- The best known methods of prevention - hand washing and other personal hygienic measures should be followed by all health care staff.
- All patients with suspected myocarditis should be admitted to a ward designated for the purpose.

Hospital wards

- Admission of all suspected myocarditis patients to a separate ward facilitate patient management. Hence, s separate ward should be designated for the purpose.
- If patients in other wards develop symptoms and signs of suspected myocarditis they also should be transferred to the designated ward.
- All hospital wards should be kept adequately ventilated and regularly cleaned.
- Wearing face masks as a routine is not beneficial and is not recommended. However, it is advisable that health care staff in the designated ward wear masks when attending to these patients, especially when carry out invasive procedures.
- All health care staff should adhere to hand washing and other personal hygienic measures.
- Visitors to the designated ward should be limited.

Operating theatre and other closed circulation areas.

- All health care staff should wear masks when working in closed circulation areas (particularly with air-conditioning) in addition to intensive care units and operating theatres.

Post-mortem procedures

- If death occurs in a patient with suspected myocarditis a pathological post-mortem should be performed.
- Standard precautions should be taken when conducting the post-mortem.
- For further examination, appropriate specimens should be collected during post-mortem .

Medical laboratory

- When handling specimens laboratory staff should practise standard precautions.

Surveillance

- Infection control nurse should maintain a register for suspected myocarditis patients with details of full name, complete address, age, sex, date of onset, date of admission and discharge, BHT number and final diagnosis.
- Acute blood samples collected from these patients for virological studies should be followed with convalescent samples 10-14 days later.
- Collection of nasal/ throat swabs and stools samples for virology are also recommended.

Other preventive activities

- All health care workers should wash their hands before and after attending to patients.
- All patients and relatives should be advised to:
  - avoid overcrowded areas.
  - perform hand washing whenever needed.
  - maintain other personal hygienic measures.

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

12th - 18th March 2005 (11th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 CB=1	01 NE=1	00	00	01 KR=1	00	01 MO=1	00	04	03	29	29	00.0%
Diphtheria	00	00	00	00	00	00	00	00	00	00	03	01	+200.0%
Measles	00	00	00	00	00	00	00	00	00	01	21	14	+50.0%
Tetanus	00	00	00	00	00	00	00	00	00	00	07	12	-41.7%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	17	14	+21.4%
Tuberculosis	104	11	09	10	08	10	00	00	152	00	2297	1297	+77.1%

Table 2: Diseases under Special Surveillance

12th - 18th March 2005 (11th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	39	05	02	00	03	02	00	01	52	77	777	1827	-57.5%
Encephalitis	01 GM=1	00	00	00	00	00	00	00	01	01	17	26	-34.6%
Human Rabies	00	00	00	00	00	01 AP=1	01 BD=1	00	02	00	15	18	-16.7%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

myocarditis which might lasts only for a few days. Cardiologists were in opinion that this type of clinical appearance is common with many viral infections including dengue fever. They are also in the opinion that there is only a remote possibility of complications – either short term or long term. However, long term close follow up of these patients is very important. In the light of the negative results of laboratory samples, some of the samples were sent to overseas laboratories for further evaluation. Results of these investigations are yet to receive.

In the event of the causative organism is not identified and the mode of transmission is not known, specific precautionary measures to contain an epidemic is difficult to recommend. The best is adhering to standard precautions with additional measures based on available evidence. Since the most common organisms responsible for recent myocarditis outbreaks in other countries are coxakie and other enteroviruses, hand washing and maintaining other personnel hygienic measures are the most justifiable preventive measures one can take in such a situation. In the present outbreak of myocarditis increased reporting of suspected cases among Badulla GH staff was a concern. This is taken in to account in the development of guidelines to prevent possible transmission of the disease from patients to other patients and from patients to hospital staff. The basic principles behind the guidelines are, improvement of personnel hygiene, prevention of possible droplet transmission wearing protective masks by health care personnel and by suspected patients when following high risk procedures, minimizing overcrowding in hospital settings, and improved patient management. In the event of similar outbreak, other health care institutions also can follow the same guidelines.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

12th - 18th March 2005 (11th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	26	268	06	51	00	00	00	12	42	89	07	23	00	01	04	28	**77**
Gampaha	08	175	04	50	01	02	00	09	00	11	05	32	00	00	02	20	**71**
Kalutara	05	37	08	78	00	00	00	14	06	06	02	28	00	00	00	11	**70**
Kandy	02	28	04	91	00	00	01	12	00	05	00	06	04	27	00	10	**73**
Matale	00	07	01	106	00	01	00	08	00	06	01	21	00	00	00	01	**83**
Nuwara Eliya	03	05	28	75	00	00	02	32	00	02	00	02	00	09	00	05	**100**
Galle	00	07	02	25	00	00	00	07	00	02	02	11	02	03	00	01	**75**
Hambantota	00	04	00	25	00	00	00	05	00	15	01	20	02	10	00	02	**90**
Matara	02	15	03	37	00	01	00	08	00	12	01	48	03	33	00	03	**43**
Jaffna	00	03	00	27	00	01	11	117	00	09	00	00	04	69	01	22	**63**
Kilinochchi	00	00	00	00	00	00	00	00	00	02	00	00	00	00	00	00	**25**
Mannar	00	00	00	04	00	00	00	14	00	25	00	00	00	00	00	02	**17**
Vavuniya	00	13	00	24	00	01	01	110	00	01	00	01	00	00	00	03	**50**
Mullaitivu	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	**00**
Batticaloa	00	00	00	08	00	01	00	01	00	00	00	01	00	01	03	56	**100**
Ampara	00	03	00	25	00	00	00	01	00	04	00	05	00	00	00	01	**29**
Trincomalee	00	27	03	89	00	00	01	07	00	08	00	05	00	01	00	40	**44**
Kurunegala	00	39	03	108	00	00	02	18	07	14	00	05	00	05	02	23	**71**
Puttalam	03	62	00	17	00	02	00	44	00	03	00	03	00	00	00	06	**67**
Anuradhapura	00	19	01	37	00	01	00	10	00	17	00	36	02	10	00	20	**74**
Polonnaruwa	02	14	02	14	00	00	03	24	00	01	00	07	00	00	01	08	**86**
Badulla	00	08	08	161	00	00	05	43	00	04	03	25	01	15	05	54	**80**
Monaragala	00	01	00	39	00	00	00	09	00	00	03	54	00	15	01	19	**50**
Ratnapura	00	24	07	128	00	07	05	111	00	09	01	14	00	03	02	09	**67**
Kegalle	01	16	04	106	00	00	00	07	00	02	01	15	00	06	09	18	**90**
Kalmunai	00	02	02	07	00	00	00	05	00	00	00	00	00	00	00	06	**40**
SRI LANKA	**52**	**777**	**86**	**1332**	**01**	**17**	**31**	**628**	**55**	**247**	**27**	**362**	**18**	**208**	**30**	**368**	**68**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 26th March 2005 :Total number of reporting units = 270.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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Vol. 32 No. 13 **26th March - 01st April 2005**

SRI LANKA - 2005

WER

GAVI

One of the most successful and cost-effective public health interventions in history is the immunization targeting children and women of childbearing age. This prevents needless suffering through sickness, disability and deaths. It benefits all people – not only through improvements in health and life expectancy but also through its social and economic impact at the global, national and community levels. Immunization has eradicated smallpox, substantially reduced morbidity and mortality from diphtheria, pertussis, tetanus and measles, and is on the verge of eradicating polio.

In today's increasingly interdependent world, acting together against vaccine-preventable diseases of public health importance and preparing for the possible emergence of diseases with pandemic potential will contribute significantly to improve global health and security. Immunization services must be sustainable since over 100 million children are born every year who need to be immunized. Moreover, in an increasingly globalized world, the global community has a clear interest in the widespread use of current vaccines as well as the rapid development of new vaccines against existing and emerging diseases. The establishment of strong national immunization services in many countries over recent years has ensured that today over 70% of the world's targeted population is reached with immunization. As a result, it is estimated that immunization carried out in an year alone will prevent more than 2 million deaths from vaccine-preventable diseases and an additional 600 000 hepatitis B related deaths (from liver cirrhosis and hepatoma) that would otherwise have occurred in adulthood among those children immunized .

Through the significant inputs by the UNICEF and WHO, since its inception in 1974, the Expanded Programme on Immunization (EPI) has provided guidance and recommendations to national authorities on how to design, develop, and manage immunization services to efficiently deliver needed immunizations. Meanwhile, during the late 1980s, the global push to achieve Universal Childhood Immunization (UCI) resulted in the establishments of national systems of immunization and rapidly rising immunization coverage.

However, there are three identified gaps in current immunization. Firstly, in certain countries, the immunization coverage is either stagnant at a suboptimal level or declining, leading to regional discrepancies. Secondly, in less developed countries, there is the lack of introduction of newly-developed techniques and vaccines against major childhood diseases. Thirdly, there is a wider gap in research priorities globally. The investments into vaccine research for diseases with high burden in developing countries are significantly limited.

The cost of these gaps is high and is reflected by the child mortality figures in the world. For example, in 2002, there were an estimated 10.5 million deaths among children under five. Of these, about 1.4 million children died from vaccine-preventable diseases for which vaccines are already available in most national immunization schedules. Although most children in high income countries have access to the vaccines they

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need, in 2003, over 27 million children missed out on immunization during their first year of life- the vast majority in low-income countries. In 2002, among all age groups, 2.1 million people died from currently vaccine-preventable diseases.

In many developing countries, immunization programmes are threatened by the economic and political instability of these countries. The commitment of political leaders towards immunization programme in the midst of strained resources and other priorities also matters. Most of these countries are in need of support of external resources if the immunization programme is to be sustainable and accessible to newly developed techniques and vaccines.

In the contemporary world vaccine development is neither simple nor straightforward. The main drive of the process is to design an effective production method for potential vaccine, which are subsequently tested for safety and efficacy, first in experimental animals and ultimately in human volunteers, using the most appropriate scientific approaches and procedures. There is a clear responsibility throughout this process to comply with a structured framework of registration requirements and normative guidelines assuring ethics, safety, and quality of research, manufacturing and development outcomes. The process for product research & development (R&D) is consequently very complex. It often takes more than 10 years to arrive at a final licensed vaccine, requiring not only excellence in R&D but also managerial and funding commitment throughout the endeavour. It results in an aggregate cost of US$ 200-500 million per successfully developed new vaccine.

Successful vaccines available for immunization programmes today are the fruits of cumulative R&D carried out during the past decades. Commercial vaccine R&D is financed through the delivery of profitable products whose returns offset development costs and provide funds for future technology and process development as well as increase the manufacturing company's share value. By definition, this commercial process will not address markets offering unacceptably low profit margins or those which are associated with high technological, marketing or political risks. If a good market is open for theses vaccines, this problem could be overcome. Again, this can be ensured by providing financial and technical support for immunization programmes in developing countries where the larger share of child population exists.

In 2000, the Global Alliance for Vaccines and Immunization (GAVI) was launched to radically improve access to vaccines in the 75 poorest countries of the world, and to strengthen their immunization services. Governments in industrialized and developing countries, UNICEF, WHO, the World Bank, non-governmental organizations, foundations, vaccine manufacturers, and public health and research institutions work together as partners in the Alliance to achieve common immunization goals, in the recognition that only through a strong and united effort can much higher levels of support for global immunization be generated.

Building on the resources already provided by individual partners in the Alliance, GAVI created The Vaccine Fund to help fill critical gaps in the overall global effort and to maintain a significant source of additional financial support from both public and private donors. In furtherance of GAVI's goals, resources from The Vaccine Fund is used to help strengthen health and immunization services, accelerate access to selected vaccines and new vaccine technologies – especially vaccines that are new or under-used Hepatitis B, Yellow Fever, and *Haemophilus Influenzae*-B, and improve injection safety.

Those counties with a per capita GNP of less than $1000 are selected for multi-year grants. To date, The Vaccine Fund has raised almost US$ 1.3 billion to support GAVI programmes and received an additional US$ 1.19 billion in pledges. This consists of different sources namely Canada, Denmark, France, Ireland, Luxembourg, the Netherlands, Norway, Sweden, the United Kingdom, and the United States, the Bill & Melinda Gates Foundation, the European Union and private donors.

During the first phase - Immunization Services Support (ISS), GAVI supported relevant countries to improve the access to immunization by strengthening their health and immunization systems. The next phase of the GAVI funding will aim at Health Systems Strengthening (HSS). The objective of the HSS is to help achieve and sustain increased immunization coverage through addressing key constraints at country level. This includes activities to strengthen performance within the immunization system and beyond that can contribute to achieving the desired effect of improved coverage rates. Applying countries has to provide costed plans, showing how they identified constraints, how the constraints will be tackled, and demonstrating the link between these actions and increased immunization coverage. Funding will be supplied

The GAVI and The Vaccine Fund.....

Has been used the raised money to improve access to vaccines and immunization in the poorest countries through efforts to:

- Strengthen routine immunization services
- Boost routine immunization coverage
- Introduce under-used vaccines
- Accelerate the development and introduction of priority new vaccines
- Improve immunization safety

By end-2003, support from GAVI and The Vaccine Fund has ensured that

- An additional 6 million children were reached with routine immunization
- Over 42 million children were immunized against hepatitis B
- Almost 5 million children were immunized against *Haemiphilus influenzae* type b (Hib)
- Over 3 million children were immunized against yellow fever.

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

19th - 25th March 2005 (12th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	02 GM=1KL=1	00	00	00	02 PU=2	01 AP=1	00	00	05	00	34	29	+17.2%
Diphtheria	02 KL=2	00	00	00	00	00	00	00	02	00	03	01	+200.0%
Measles	00	00	00	00	00	00	00	00	00	02	21	16	+31.3%
Tetanus	00	00	00	00	00	00	00	00	00	00	07	13	-46.2%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	17	14	+21.4%
Tuberculosis	20	72	27	25	37	00	35	00	216	379	2513	1676	+49.9%

Table 2: Diseases under Special Surveillance

19th - 25th March 2005 (12th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	23	01	00	03	02	00	00	03	32	58	830	1921	-56.8%
Encephalitis	00	00	00	00	00	00	00	00	00	02	17	29	-41.4%
Human Rabies	00	00	00	00	00	00	00	00	00	00	16	19	-15.8%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

to countries on the basis of performance against their submitted plans.

GAVI's contribution to EPI in Sri Lanka.

Since 2003, the Expanded Programme on Immunization in Sri Lanka has the opportunity of obtaining financial support from The Vaccine Fund. The GAVI support to Sri Lanka came as the introduction of the Hepatitis B vaccine into the EPI and improvement of vaccine safety by introduction of auto-disable syringes and a system of proper collection of sharps for disposal in 2003. Initially, GAVI supported for the total supply of the AD syringes used for infant immunization. From 2005 onwards, Sri Lanka uses only AD syringes for all immunization activities. GAVI will provide around 80% of this requirement for the year 2005 and 55% in 2006. The expenses for the balance amount in 2005-2006 and thereafter for the entire requirement will be borne by the government.

Introduction of the Hepatitis B vaccine into the EPI in 2003 was financially supported by the GAVI and will be continued up to 2008. The next possible contribution from GAVI would be funding for introduction of *Haemophilus influenzae* B (Hib) vaccine into the EPI.

Currently, the Epidemiological Unit along with the concurrence of other stakeholders, is in the process of the preparing the Financial Sustainability Plan for EPI in Sri Lanka. This document contains a cost analysis of the EPI in Sri Lanka, predictions on future activities of EPI and its cost and the strategies to ensure an uninterrupted financial flow into the EPI activities. This document will be submitted to the GAVI executive board and will be the guide for GAVI's future contributions to EPI in Sri Lanka.

Source:

The Global Alliance for Vaccines and Immunization. 2005. http://www.vaccinealliance.org/

World Health Organization 2004. Initiative for Vaccine Research. 2004-2005 Strategic Plan [WHO/IVB/04.13] WHO, Geneva.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

19th - 25th March 2005 (12th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	14	294	01	52	00	00	00	13	06	95	02	29	00	01	02	29	**69**
Gampaha	05	183	00	51	00	02	00	09	00	11	00	32	00	00	00	22	**57**
Kalutara	04	42	10	90	00	00	01	15	00	06	02	30	00	00	03	14	**60**
Kandy	01	30	05	102	00	00	07	19	00	05	00	06	00	28	02	12	**64**
Matale	00	07	06	112	00	01	01	09	00	06	03	24	00	00	00	01	**92**
Nuwara Eliya	00	05	20	95	00	00	04	36	00	02	01	03	00	09	00	05	**86**
Galle	00	07	02	28	00	00	00	07	00	02	03	15	00	03	00	01	**56**
Hambantota	00	04	01	26	00	00	00	05	14	29	00	20	02	12	01	03	**80**
Matara	00	17	03	41	00	01	00	08	00	13	02	51	00	36	00	03	**29**
Jaffna	01	04	00	29	00	01	01	119	00	09	00	00	00	69	00	22	**38**
Kilinochchi	00	00	00	00	00	00	00	00	00	02	00	00	00	00	00	00	**00**
Mannar	00	00	00	05	00	00	00	16	00	25	00	00	00	00	00	04	**83**
Vavuniya	01	14	00	27	00	01	00	118	01	02	00	01	00	00	00	03	**50**
Mullaitivu	00	00	00	01	00	00	00	01	00	00	00	00	00	03	00	01	**100**
Batticaloa	00	00	01	09	00	01	00	01	00	00	00	01	00	01	12	68	**43**
Ampara	00	03	00	25	00	00	00	01	00	04	00	05	00	00	00	01	**29**
Trincomalee	01	28	01	92	00	00	00	07	00	08	00	05	00	01	03	43	**33**
Kurunegala	01	40	07	118	00	00	01	19	00	14	01	06	00	05	01	24	**47**
Puttalam	01	63	02	19	00	02	07	51	00	03	00	03	00	00	00	06	**56**
Anuradhapura	00	21	00	39	00	01	01	11	06	24	01	38	01	11	01	22	**42**
Polonnaruwa	00	14	02	16	00	00	00	24	00	01	00	07	00	00	00	08	**43**
Badulla	00	08	03	164	00	00	02	45	00	04	01	27	00	15	00	54	**53**
Monaragala	00	01	02	41	00	00	00	10	00	00	01	55	00	16	01	20	**70**
Ratnapura	02	26	04	134	00	07	10	121	00	09	01	16	00	03	02	12	**60**
Kegalle	01	17	05	111	00	00	00	07	00	02	01	16	01	07	02	20	**60**
Kalmunai	00	02	02	09	00	00	00	05	00	00	00	00	00	00	00	06	**10**
SRI LANKA	**32**	**830**	**77**	**1436**	**00**	**17**	**35**	**677**	**27**	**276**	**19**	**390**	**04**	**220**	**30**	**404**	**54**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 02nd April 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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ON STATE SERVICE

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WEEKLY EPIDEMIOLOGICAL REPORT
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Vol. 32 No. 14 02nd - 08th April 2005

WER SRI LANKA - 2005

Strengthening Measles and Rubella Surveillance

Measles has a high mortality and morbidity among children. Although rubella is a mild disease among children and adults, it has marked teratogenic effects if a pregnant woman is infected especially during the first trimester. Both illnesses are vaccine preventable. Vaccination against measles was initiated in Sri Lanka in 1984. Vaccination against rubella was commenced in 1996 on a phased manner and was implemented island wide in 1997. The main objective of measles and rubella immunization programme is to prevent the morbidity and mortality associated with measles, rubella and Congenital Rubella Syndrome (CRS). Considering the high percentage of life long complications and the considerable mortality rate associated with CRS, it has been decided to intensify the surveillance programme for rubella and CRS along with measles (General Circular No.02-48/2005). This combined surveillance programme is expected to strengthen the control activities of these diseases(1).

According to this circular, several activities have been identified to be carried out during the period of 2005 to 2010 to strengthen the epidemiological and laboratory surveillance of rubella, CRS and measles,. They are:

1. Close monitoring of cases of rubella and measles
2. Introduction of weekly reporting of rubella and CRS including zero case reporting
3. Laboratory investigation of all cases of rubella and measles for antibodies (IgG and IgM)
4. Prediction of outbreaks – the accumulation of susceptibles will be monitored to permit prediction of future outbreaks.

A national CRS/measles register will be maintained at the Epidemiological Unit. All present AFP surveillance sites will be considered as CRS/measles surveillance sites. These sentinel sites are the institutions where a Paediatrician is available. All infection control nurses (ICN) at sentinel sites will maintain a CRS/measles register as the one maintained at the Epidemiological Unit. The ICN are also expected to visit all medical, paediatric, obstetric, cardiology, ophthalmology and otolaryngology (ENT) wards for detection of cases (both rubella and measles) and to notify promptly to the Epidemiological Unit by phone/fax/E-mail.

Each suspected case of rubella/CRS/measles would be included in the weekly reporting form for AFP/measles/rubella from hospital (sentinel sites) and would be sent every Friday to the Epidemiologist, Epidemiological Unit, Colombo with a copy to the Regional Epidemiologist. This form is to be sent as a zero report even if no cases have been detected for the week . A total of 52 reports should be received from each site per year and the performance rate will be measured accordingly.

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Rubella is a common cause of childhood rash and fever; its public health importance relates to the teratogenic effects of primary rubella infection in pregnant women. After infection in the first trimester, there is an approximately 50% increase in risk of spontaneous abortion. CRS manifestations in surviving infants may be transient (e.g. purpura); permanent structural manifestations (e.g. deafness, congenital heart disease, cataract); or late-emerging conditions (e.g. diabetes mellitus). Sensorineural deafness may occur following maternal infection up to the 19th week of pregnancy, while cataract and heart disease only occur after infection prior to the ninth gestational week.

CRS may be diagnosed by its classic triad of clinical signs: cataract, heart disease, and deafness. However, many infants only have one of these manifestations, or may present earlier with neonatal signs; laboratory confirmation of the diagnosis is therefore recommended.

Measles is a highly infectious disease and an important childhood disease in Sri Lanka. It is again a febrile illness with a rash and presents with a prodrome after 10-12 days of exposure. The rash follows the prodrome in2-4 days. Measles is a systemic infection although the primary site of infection is the respiratory tract. Approximately 30% of reported measles cases will develop one or more complications (2). These range from diarrhoea, otitis media, pneumonia, seizures and encephalitis to death. These complications are more common among children less than 5 years old and among adults over 20 years of age. Incidence of measles has gradually decreased in the country following inclusion of the measles vaccine in the Expanded Programme on Immunization (EPI). However it still rates high as an important public health issue.

Surveillance

Case Detection

For intensified epidemiological surveillance purposes, case definitions have been developed for rubella, CRS and measles.

Rubella is defined as an illness that has following characteristics: acute onset of generalized maculopapular rash; temperature greater than 99.0^{0}F (> 37.2^{0}C); arthralgia, arthritis, lymphadenopathy (suboccipital/postauricular/cervical) or conjunctivitis.

CRS is defined as an illness usually manifesting in infancy resulting from rubella infection in utero and characterized by one or more signs/symptoms below or by laboratory evidence consistent with CRS.

1. Cataract/congenital glaucoma, pigmentary retinopathy
2. Congenital Heart Disease (commonly Patent Ductus Arteriosus or Pulmonary artery Stenosis)
3. Loss of hearing
4. Purpura, splenomegaly, jaundice
5. Meningoencephalitis, microcephaly, mental retardation
6. Radiolucent bone disease

For epidemiological surveillance Measles is defined as an illness with fever and maculopapular rash (non vesicular) with at least one of the following signs/symptoms.

1. Cough
2. Coryza
3. Conjunctivitis

Rubella virus may be isolated for 6-12 months following birth, and occasionally longer, from nasopharyngeal swabs, urine specimens, or cerebrospinal fluid, or less commonly from tissues obtained by biopsy, autopsy, or surgical procedures. Rubella-specific IgM is readily detected in the first 6 months of life, and among a decreasing proportion of cases up to 1 year of age. Its detection usually indicates prenatal rather than postnatal infection.

The persistence of rubella-specific IgG beyond 6 months (the age when maternally derived IgG would usually have waned) can be detected in 95% of infants with CRS. However, the presence of IgG in a child over 6 months of age may indicate either prenatal or postnatal infection.

Isolation of measles virus is not recommended as a routine method to diagnose measles. However it is extremely important for molecular epidemiological surveillance activities to determine circulating viral strains in the country(2).

Laboratory Confirmation

For surveillance purposes, isolation of rubella virus or significant rise between acute and convalescent phase titres in serum rubella IgG antibody levels or positive serological test for rubella IgM antibodies, would fulfil the criteria for laboratory diagnosis of rubella infection. Criteria for diagnosis of CRS include isolation of rubella virus, presence of rubella IgM antibodies or persistent infant rubella antibody levels at a higher level and for a longer period than that is expected from passive transfer of maternal antibodies.

Detection of measles specific IgM antibodies in blood collected within 3-28 days after onset of the rash and isolation of measles virus from urine, naso-pharyngeal aspirates or peripheral blood lymphocytes during the prodromal or rash stages of the disease are considered as lab criteria to diagnose measles.

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

26th March - 01st April 2005 (13th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	00	00	00	00	00	00	34	34	0%
Diphtheria	00	00	00	00	00	00	00	00	00	00	04	01	+200.0%
Measles	00	02 ML=1NE=1	00	00	00	00	00	00	02	02	23	20	+31.3%
Tetanus	00	00	00	00	00	00	00	00	00	00	07	13	-46.2%
Whooping Cough	00	00	00	00	00	00	00	00	00	01	18	15	+21.4%
Tuberculosis	127	00	08	17	29	00	14	28	223	118	2736	1794	+52.5%

Table 2: Diseases under Special Surveillance

26th March - 01st April 2005 (13th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	18	00	01	02	01	03	00	00	25	69	876	2022	-56.8%
Encephalitis	00	00	00	00	00	00	00	03 RP=3	03	06	20	35	-41.4%
Human Rabies	00	00	00	00	00	00	00	00	00	01	16	20	-15.8%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

Immunization for Rubella and Measles in EPI

- **Measles vaccine is given at 9 months of age.**
- **Measles-Rubella vaccine (MR) is given to 3 year olds.**
- **All 11-44 year old females are required to have the Rubella vaccine provided that they are not pregnant at the time of immunization.**
- **Male and female 8 year olds are immunized with Rubella vaccine.**

  However in place of rubella vaccine, it has been decided to immunize the 8 year olds with MR vaccine till the large balance stocks remaining from the Measles Catch-Up Programme is used up. (These stocks are to expire in August 2005). This will also provide them with a second opportunity for measles immunization.

Collection of Specimens

A blood sample of 2-5ml in a sterile, dry, screw capped container without anti coagulants would suffice for confirmation of rubella/CRS. These samples should be left at room temperature for 30 minutes before refrigerating till dispatch to MRI. For measles, a single sample of blood for virus isolation should be collected within 3 days of onset of the rash or at the first contact with a health facility. For serologic testing for measles blood should be collected within 3-28 days.

Source:

(1) Department of Health General Circular No 02-48/2005

(2) Department of Health and Human Services. Centres for Disease Control and Prevention. *Epidemiology and Prevention of Vaccine Preventable Diseases.* January 2004

Table 3: Selected notifiable diseases reported by Medical Officers of Health

26th March - 01st April 2005 (13th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	12	313	04	58	00	00	00	13	01	96	01	34	00	01	06	35	**92**
Gampaha	03	193	02	54	00	02	00	10	00	11	02	38	00	00	01	24	**71**
Kalutara	03	48	05	96	00	00	00	16	01	63	02	32	00	00	01	15	**80**
Kandy	00	30	02	107	00	00	00	19	00	05	00	06	02	31	00	12	**64**
Matale	00	07	03	116	00	01	00	10	00	06	00	24	00	00	00	01	**67**
Nuwara Eliya	00	02	17	113	00	00	04	45	00	02	00	03	00	09	01	06	**86**
Galle	00	07	02	30	00	00	00	07	00	02	04	20	00	03	01	02	**88**
Hambantota	00	04	01	27	00	00	00	05	00	29	01	21	03	15	00	05	**100**
Matara	01	18	00	44	00	01	00	11	00	13	01	52	01	38	00	03	**36**
Jaffna	00	04	01	31	00	01	01	120	00	09	00	00	01	70	04	26	**63**
Kilinochchi	00	00	00	00	00	00	00	00	00	02	00	00	00	00	00	00	**50**
Mannar	00	00	00	05	00	00	00	16	00	25	00	00	01	01	00	04	**17**
Vavuniya	00	14	01	28	00	01	00	118	00	02	00	01	00	00	00	03	**50**
Mullaitivu	00	00	00	01	00	00	00	01	00	00	00	00	00	03	00	01	**100**
Batticaloa	00	00	00	09	00	01	00	01	00	00	00	01	00	01	08	77	**86**
Ampara	01	04	00	26	00	00	00	01	00	04	00	05	00	00	00	01	**57**
Trincomalee	01	29	04	121	00	00	00	07	00	14	00	05	00	01	04	50	**56**
Kurunegala	01	44	04	122	00	00	01	20	00	14	00	06	00	05	00	25	**71**
Puttalam	00	64	00	19	00	02	00	51	00	03	00	03	00	00	00	06	**67**
Anuradhapura	03	24	01	40	00	01	00	11	00	24	00	39	00	12	01	23	**84**
Polonnaruwa	00	14	01	18	00	00	00	27	00	01	01	08	00	01	00	08	**71**
Badulla	00	08	13	182	00	00	12	58	00	04	03	30	00	16	03	59	**93**
Monaragala	00	01	01	42	00	00	00	10	00	00	01	56	02	18	00	21	**60**
Ratnapura	00	29	10	159	03	10	03	127	01	10	00	17	00	03	00	12	**73**
Kegalle	00	17	03	120	00	00	00	07	00	02	02	18	02	09	01	22	**70**
Kalmunai	00	02	02	11	00	00	00	05	00	00	00	00	00	00	00	07	**40**
SRI LANKA	**25**	**876**	**77**	**1579**	**03**	**20**	**21**	**716**	**03**	**341**	**18**	**419**	**12**	**237**	**31**	**448**	**70**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 09th April 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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Vol. 32 No. 15 **09th - 15th April 2005**

WER SRI LANKA - 2005

Another Milestone in EPI – Sri Lanka

Sri Lanka has been identified as a Centre of Excellence in Vaccine Procurement by the World Health Organization (WHO). The national Expanded Programme on Immunization (EPI) of Sri Lanka had already been recognized by the WHO as a Centre of Excellence for surveillance on Adverse Effects Following Immunization (AEFI).

These are two of many achievements by the national Expanded Programme of Immunization (EPI) which is considered as one of the finest in the world by global health authorities (1). The EPI has already met many of the international community's immunization goals for 2005 and 2015 and has introduced new vaccines in response to the country's disease burden and population demand. Over the years it has set disease elimination and eradication objectives in accordance with the maturity of the programme and has continued to finance all basic operational costs of the routine programme. Local and international studies have also shown that immunization coverage and disease incidence in the country's historically inaccessible strata have remarkably improved and it is noted in international forums that only a few countries have realized this balance of effectiveness with equity(1).

Since 1990, EPI of Sri Lanka has been procuring its own vaccine supplies from the global vaccine market. Sri Lanka was one of the few countries who had ventured into this field globally and the second in the South East Asian region. For many years both UNICEF and WHO have offered vaccine procurement services to EPI of Sri Lanka and immunization programmes of other countries which were in need. As some pioneering countries like Sri Lanka undertook procuring their own vaccines, WHO and UNICEF have volunteered to guide and assist them to develop more sophisticated and efficient procurement systems.

Vaccine procurement involves a product of a very special nature – vaccines, which need to be purchased in the optimum quality at an affordable cost, in adequate quantities to meet the country's immunization demands based on sustainable financial strategies.

Vaccines are biological substances and are subjected to lot-to-lot variation. Childhood immunization invariably has a national impact on the public health sector and the immunization programme of a country is responsible for immunization credibility which is highly dependent on assurance of vaccine quality. Mistakes in the procurement process could have a catastrophic effect on the country both economically and morally. It is therefore essential that vaccine production and quality control demand full compliance

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.with Good Manufacturing Practices (GMP) for optimum quality assurance. GMP is a set of standard operational procedures on vaccine manufacturing laid down collectively by a team of experts in the Global Committee on Biological Standardization. This ensures that vaccine manufacturers comply with these stringent guidelines and vaccines that enter the competitive global vaccine market are of optimum quality. However at the same time, vaccines are market products and are therefore subjected to standard business requirements and also require supplementary considerations.

In this context, UNICEF and WHO initiated the GTN programmes on vaccine procurement to provide the necessary expertise and specialized knowledge to immunization managers and staff involved. WHO conducted its first ever Global Training Network (GTN) programme on Vaccine Procurement in Colombo in December 2004. Sri Lanka's selection as the venue for this inaugural training programme was based on it being a Centre of Excellence on the subject.

The following are the objectives for these training programmes.

1. To define vaccine procurement requirements within the new global and national regulations and policies;
2. To define the basic concepts and practical approaches for optimum performance in vaccine procurement;
3. To improve the knowledge on the tools and techniques used specifically to improve the process;
4. To share experiences regarding good practice procurement among the participants;
5. To gain hands-on experience in critical aspects of the process;

In the concluded training programme in December, all gov -ernment agencies involved in the field of vaccines, i.e. Ep- -idemiological Unit, State Pharmaceutical Corporation and the National Drug Regulatory Authority were collectively involved as resource persons. The programme imparted further impetus to programme managers and other staff to further improve performances in relevant disciplines and to strengthen institutional capacities through inputs from the WHO. The second global training programme under GTN is scheduled to be held in Sri Lanka in December 2005.

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EPI Sri Lanka Plays Host to AEFI GTN Training For the Third Time

Third international training workshop on AEFI Surveillance under the GTN programme was concluded last week in Colombo. This workshop was held from 20th-25th June at the Hotel Galadari, Colombo. Sri Lanka which has been recognized as a Centre of Excellence on AEFI Surveillance on the performance of the national EPI programme, was selected to host this training for the third consecutive time by the WHO. Sri Lanka is recognised as having one of the strongest AEFI surveillance systems in an immunization programme globally. The AEFI surveillance programme of the national EPI programme was initiated in 1995 even before the launching of the 'Strengthening of Immunization Safety Project' by WHO. The first WHO GTN training workshop on AEFI with the participation of 8 countries was held in Colombo in 2003 and the second workshop which had representatives from another 8 countries was conducted in the country in 2004. Australia, Iran, Bhutan, Nepal, Bangladesh, Cambodia and Maldives were the invited participants of this year's programme.

Immunization Services Quality Audit

An audit on quality of national immunization services will be conducted island wide by the Epidemiological Unit as a component of a World Bank sponsored Health Sector Development Project. This audit is scheduled to be held in August- September 2005. All aspects of the immunization programme at the level of the immunization clinic, will be assessed for quality during this audit. The clinics will be rated on their performance to identify the better performing immunization centres. Within the next 5 years various aspects of immunization service provision are expected to be upgraded based on the findings of the audit. The areas expected to be improved will include infrastructure requirements, training needs and staff incentives and development.

Table 1: Vaccine-preventable diseases & AFP

02nd - 08th April 2005 (14th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 KL=1	01 NE=1	00	00	00	00	00	00	02	00	36	34	+5.8%
Diphtheria	00	00	00	00	00	00	00	00	00	00	04	01	+300.0%
Measles	00	00	00	00	00	00	00	00	00	00	24	20	+20%
Tetanus	01 CB=1	00	00	00	00	00	00	00	01	01	08	14	-42.8%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	18	15	+20%
Tuberculosis	NA	NA	NA	NA	NA	NA	NA	NA	NA	228	-	2022	-

Table 2: Diseases under Special Surveillance

02nd - 08th April 2005 (14th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	14	04	01	00	00	00	00	00	19	12	900	2052	-56.1%
Encephalitis	00	00	00	00	00	00	00	00	00	00	21	36	-41.6%
Human Rabies	00	00	00	00	00	00	00	00	00	00	16	20	-20%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala,

A Note on the Open Vial policy……

Feedback from field health staff on the recently introduced Open Vial Policy has been promising. However it has been noted that specific instructions provided in the circular (General Circular No: 01-06/2005 - 'Implementation of Open Vial Policy in National Immunization Programme') have not been entirely implemented in some institutions.

This activity has been initiated following careful consideration of many factors by the National Advisory Committee on Communicable Diseases, to achieve specific objectives which are vital to sustain the superiority of the national EPI programme. Therefore it is crucial that the guidelines given in the circular are carefully implemented by all health staff concerned.

The WER team wishes to acknowledge Dr T.S.R.Peiris, Assistant Epidemiologist, Epidemiological Unit, for the information provided for this article.

Source: (1) *Health Sector Development Project (HSDP) Project Document, World Bank, 2004*

Table 3: Selected notifiable diseases reported by Medical Officers of Health

02nd - 08th April 2005 (14th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	08	321	04	62	00	00	02	15	00	96	04	39	00	01	04	39	**62**
Gampaha	06	202	05	59	00	02	00	11	00	11	01	39	00	00	00	25	**71**
Kalutara	00	48	00	96	00	00	00	16	00	63	00	32	00	00	00	15	**20**
Kandy	04	34	06	113	00	00	01	20	00	05	00	06	02	33	01	13	**32**
Matale	00	07	00	116	00	02	00	10	00	06	00	24	00	00	00	01	**08**
Nuwara Eliya	00	02	09	122	00	00	02	47	00	02	00	03	00	09	00	06	**71**
Galle	00	07	00	30	00	00	00	07	00	02	00	20	00	03	00	02	**13**
Hambantota	01	05	00	27	00	00	00	05	00	29	01	22	01	16	00	05	**70**
Matara	00	18	01	46	00	01	01	12	00	13	00	53	02	42	00	03	**29**
Jaffna	00	04	00	31	00	01	00	120	00	09	00	00	00	70	00	26	**00**
Kilinochchi	00	00	00	00	00	00	00	00	00	02	00	00	00	00	000	00	**25**
Mannar	00	00	00	05	00	00	00	16	00	25	00	00	00	01	00	04	**17**
Vavuniya	00	16	02	31	00	01	00	121	00	02	00	01	00	00	00	03	**50**
Mullaitivu	00	00	00	01	00	00	03	04	00	00	00	00	00	03	00	01	**100**
Batticaloa	00	00	00	09	00	01	00	01	00	00	00	01	00	01	00	77	**14**
Ampara	00	04	00	26	00	00	00	01	00	04	00	05	00	00	00	01	**14**
Trincomalee	00	29	00	122	00	00	00	07	00	14	00	05	00	01	00	52	**22**
Kurunegala	00	44	00	123	00	00	00	21	05	19	00	06	00	05	00	25	**29**
Puttalam	00	64	00	19	00	02	00	53	00	03	00	03	00	00	01	08	**22**
Anuradhapura	00	24	00	40	00	01	00	11	00	24	00	39	00	12	00	23	**32**
Polonnaruwa	00	14	03	21	00	00	02	30	00	01	00	08	00	01	00	08	**57**
Badulla	00	08	03	185	00	00	02	60	00	04	00	30	00	16	01	60	**27**
Monaragala	00	01	00	47	00	00	01	11	00	00	00	56	00	18	00	21	**10**
Ratnapura	00	29	02	162	00	10	02	132	00	10	00	17	00	03	00	12	**20**
Kegalle	00	17	05	125	00	00	00	07	00	02	00	18	00	09	00	22	**30**
Kalmunai	00	02	02	13	00	00	00	05	00	00	00	00	00	00	00	07	**30**
SRI LANKA	**118**	**900**	**42**	**1631**	**00**	**21**	**16**	**743**	**05**	**346**	**06**	**427**	**05**	**244**	**07**	**459**	**31**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 16th April 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WEEKLY EPIDEMIOLOGICAL REPORT
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Vol. 32 No. 16 **16th - 22nd April 2005**

WER SRI LANKA - 2005

Health Care Waste Management

Waste management is a burning environmental issue as well as an intense social issue. Health care waste is a major component of the problem in the international arena although it has not yet gained notoriety in the country. This issue of WER explores the subject.

Health Care Waste

Health care waste is defined as waste that are generated by health care establishments, research facilities and laboratories. These are usually generated during diagnostic procedures, treatment of diseases, immunization, biomedical research and during production and testing of biological materials. Therefore hospitals, nursing homes, clinics, pathology or microbiology laboratories, blood banks and veterinary institutes are identified as main sources of health care waste.

Health care waste is broadly classified as hazardous and non-hazardous waste. Usually 75%-90% of all health care waste is non-hazardous and could be considered as harmless as any other domestic waste. Although produced by health care institutions, these are not contaminated with potential infectious agents, toxic products or radiation.

Hazardous health care waste is further classified by the WHO as hazardous and highly hazardous according to the extent of harm they could cause.

Hazardous health care waste in general is harmful to health of humans and animals and also to the environment. These include patho--logical, anatomical, pharmaceutical, chemical waste and waste with high contents of heavy metal and pressurized containers. Highly hazardous health care waste includes sharps, infectious waste, radioactive waste and geno toxic waste.

Health Hazards of Improper Health Care Waste Disposal

If not treated properly, infectious waste is capable of transmitting infectious diseases. A pathogen with an inoculum containing an infectious dose has to be present in the infectious waste for an infection to spread from such waste. However, contact with the appropriate portal of entry and the susceptibility of the host are also required to complete the infection process. Respiratory tract infections and gastro intestinal infections that are acquired from waste are extremely rare, while infections acquired from sharps contaminated with blood and blood products are more likely to occur from handling clinical waste. Acquiring an infection from health care waste is rare as the survival of the pathogenic organism vary, depending on the humidity, temperature and the presence of organic matter in the waste. However all pathogens are susceptible to treatment methods used in management of health care waste.

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(Continued from page 1)

Current Waste Disposal System in Health Care Institutions

Disposal of waste generated in health facilities is a major problem faced by health administrators. There are 973 government hospitals in the country and a massive amount of waste is generated by these institutions. Estimated average hospital waste production is 0.36kg per bed per day. In the Colombo Municipal Council area alone, around 18 metric tons of waste is produced daily by the health care institutions. One sixth of this amount is categorized as hazardous waste.

Treatment cost per metric ton of health care waste is estimated at approximately US$ 200-250. Proper management of health care waste should ensure smooth functioning of the hospitals with the least threat to human, animal or environment health. Presently various mechanisms are in place within the health system to ensure that this goal is achieved.

- A National Steering Committee on Health Care Waste Management has been set up at the national level. This is a body with multi-sectoral representation and it is involved in formulating national policies, developing action plans and setting up implementation mechanisms.
- Health Care Waste Management Committees have been set up in Teaching, General, Base and Special hospitals and under the guidance of these, relevant health personnel in 51 hospitals have been trained on separation, collection and appropriate disposal methods of health care waste.
- A low-cost incinerator has been constructed as a pilot project in General Hospital Kalutara in year 2002. This incinerator was used to burn non-PVC plastic materials as well.
- A national colour code for separation of health care waste has been introduced successfully based on WHO guidelines.
- Moves are under way for establishment of a central hazardous waste management facility by the Ministry of Environment and concurrence has been given by the Ministry of Health to include clinical waste under this project.
- Ministry of Environment and Central Environment Authority who will formulate national regulations on management of hazardous waste, are to include clinical waste under its scheduled programme.
- Provisions from national Budget for waste management in hospitals were made available for the first time in year 2000 and will now be a regular allocation.
- A survey on liquid waste disposal in a number of selected hospitals is to be carried out by the Indus -trial Technology Institute under the patronage of the Ministry of Health.

Current practices of disposal of health care waste in health care institutions do not meet the specific and meticulous requirements needed for clinical waste management. Using rudimentary incinerators, burning in open fires on the ground or in pits, burial and dumping are the common methods used.

Laws pertaining to Health Care Waste Management

Law affects the handling of clinical waste in five main respects:

1. The method of its disposal
2. Exposure to waste
3. Pollution of the environment from residues
4. Exposure to residual by-products
5. Duty of care

The main legislation pertaining to the process of waste disposal is the National Environment Act of 1990. The Central Environment Authority (CEA) is the responsible national agency for waste disposal under this Act. Waste discharge, deposition of effluents/waste, emission of vibrations/noise and air emissions which may arise as a result of the operation of a process or industry should be disposed of in accordance with the standards and criteria prescribed by the National Environment regulations No 1 of 1990 (Protection and Quality). Therefore health care waste disposal is under the direct control of the CEA and is subjected to local council/authority legislations.

Safe Disposal of Health Care Waste

Health care waste management ideally incorporates principles such as waste avoidance, minimization, recycling and addresses issues such as segregation, packing, labelling, collection, storage, transportation, receipt, treatment, discharge and final disposal. Application of basic principles of waste management, good operating practices, safe techniques and environment friendly technologies at each step are prerequisites for an effective health care waste management system.

Different treatment technologies are applied to mitigate environmental and health impacts from health care waste. The selection of these should be considered based on factors such as type of waste, quantity of waste, reliability and efficiency of the technique, safety and social acceptability, available land area, type of location of the site, government regulations, affordability and sustainability of the

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

09th - 15th April 2005 (15th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	01 Jf=1	00	00	00	00	01	00	37	34	+8.8%
Diphtheria	00	00	00	00	00	00	00	00	00	00	02	01	+100.0%
Measles	00	00	01 HB=1	00	00	00	00	00	01	02	25	23	+8.7%
Tetanus	00	00	00	00	00	00	00	00	00	02	08	17	-52.9%
Whooping Cough	00	00	00	00	00	00	00	00	00	01	18	19	-5.2%
Tuberculosis	131 CB=131	00	00	00	00	18 AP=18	00	00	149	112	2885	2134	+35.2%

Table 2: Diseases under Special Surveillance

09th - 15th April 2005 (15th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	05	00	00	00	00	00	00	00	05	72	927	2263	59.0%
Encephalitis	00	00	00	00	00	00	00	00	00	02	21	37	-43.2%
Human Rabies	00	00	00	00	00	00	00	00	00	02	18	25	-28.0%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

adopted technique and the need for trained personnel for operation and maintenance.

Thermal incineration in double-chambered plants is considered as the technique that ensures the most reliable treatment for infectious health care waste. But hazardous waste incinerators require chamber temperatures over 1300 ^{0}C for total destruction of waste and for meeting air emission requirements. However such high temperatures necessitate the addition of an external fuel source. Therefore this is considered the most expensive technique available although the end product is completely innocuous.

Microbiological destruction of health care waste can be achieved by sterilization using autoclaves or hydroclaves. In autoclaves pathogens are destroyed by direct steam injection at moderate pressures. Hydroclaves use indirect steam and therefore ensures complete sterilization as long as loading constraints are met. For both these methods shredding and external steam supply may be required depending on the capacity of the machine.

Chemical disinfection and deep burial are low-cost measures identified for biomedical waste disposal.

***Source**: This article is based on the seminar 'Health Care Waste Management' conducted by the Sri Lanka Medical Association Committee on Communicable Diseases. Experts of related fields who addressed this seminar included Dr S D Athukorala, Consultant Microbiologist, Dr S T G R de Silva DDG Med Services, Ministry of Health, Dr C K Shanmugarajah, Director Environment & Occupational Health Ministry of Health, Prof Lal Chandrasena Managing Director Nawaloka Hospital, Dr Ajantha Perera Environmentalist and Dr Suren Wijekoon Department of Chemical & Process Engineering University of Moratuwa. The Seminar was held on 9th October 2004.*

Table 3: Selected notifiable diseases reported by Medical Officers of Health

09th - 15th April 2005 (15th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	02	328	01	63	00	00	00	15	00	97	00	39	00	01	00	39	**38**
Gampaha	03	208	03	63	00	02	01	12	00	11	02	42	00	00	01	26	**79**
Kalutara	00	53	03	118	00	00	00	17	00	63	00	35	00	00	00	16	**70**
Kandy	00	35	00	117	00	00	00	22	00	05	00	06	00	33	00	13	**50**
Matale	00	07	00	116	00	02	01	12	00	06	02	26	00	00	00	01	**33**
Nuwara Eliya	00	02	00	123	00	00	02	53	00	02	01	04	01	10	02	08	**29**
Galle	00	07	00	30	00	00	00	07	00	02	00	21	00	03	00	02	**38**
Hambantota	00	05	00	27	00	00	00	05	00	29	00	22	00	16	00	05	**60**
Matara	00	19	00	49	00	01	00	12	00	13	00	55	00	42	00	03	**36**
Jaffna	00	04	00	31	00	00	00	120	00	10	00	00	00	70	00	26	**25**
Kilinochchi	00	00	00	00	00	00	00	00	00	02	00	00	00	00	00	00	**25**
Mannar	00	00	00	08	00	00	02	21	00	25	00	00	00	01	00	04	**83**
Vavuniya	00	16	01	33	00	01	00	130	00	02	00	01	00	00	00	03	**50**
Mullaitivu	00	00	00	01	00	00	00	04	00	00	00	00	00	03	00	01	**00**
Batticaloa	00	00	00	09	00	01	00	01	00	00	00	01	00	01	00	79	**71**
Ampara	00	04	00	26	00	00	00	01	00	04	00	05	00	00	00	01	**00**
Trincomalee	00	30	03	130	00	00	00	09	00	15	00	05	00	01	07	61	**78**
Kurunegala	00	44	01	129	00	00	01	22	00	20	00	06	00	05	00	26	**71**
Puttalam	00	66	02	21	00	02	00	57	00	03	00	03	00	00	00	08	**56**
Anuradhapura	00	24	00	45	00	01	00	12	00	24	00	40	00	12	00	23	**42**
Polonnaruwa	00	14	00	21	00	00	00	30	00	01	01	10	00	01	00	08	**71**
Badulla	00	08	00	186	00	00	00	65	00	04	00	30	00	17	00	63	**47**
Monaragala	00	01	00	47	00	00	00	12	00	00	00	60	00	18	00	21	**60**
Ratnapura	00	32	02	178	00	11	01	141	00	13	01	18	00	03	00	15	**40**
Kegalle	00	18	00	127	00	00	00	07	07	09	00	18	00	10	00	23	**40**
Kalmunai	00	02	00	13	00	00	00	05	00	00	00	00	00	00	00	07	**50**
SRI LANKA	**05**	**927**	**16**	**1711**	**00**	**21**	**08**	**792**	**07**	**360**	**07**	**447**	**01**	**247**	**10**	**482**	**50**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 23rd April 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WEEKLY EPIDEMIOLOGICAL REPORT

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Vol. 32 No. 17 **23rd - 29th April 2005**

SRI LANKA - 2005

WER

Differential Diagnosis of Acute Flaccid Paralysis

Sri Lanka has not reported a single case of poliomyelitis since 1993. Case based surveillance of Acute Flaccid Paralysis (AFP) cases have been initiated in 1991 and as indicators required by the WHO show, the performance of the national surveillance programme is commendable and well recognised by the Global Commission for Certification of Poliomyelitis Eradication (GCC) and its South East Asian regional commission, Regional International Committee on Certification of Poliomyelitis Eradication (RICCPE).

World Health Assembly has set the goal for eradication of poliomyelitis by year 2010. Already, three (03) of the six WHO regions, namely Pan American, Western Pacific and European have achieved Regional Certification. In our South East Asian region, only India has been reporting poliomyelitis cases out of its 11 member countries till this year. In March 2005, Indonesia which has not had poliomyelitis cases since 1995, reported a single case. They have reported 122 poliomyelitis cases up to mid year 2005.

This indicates the necessity of a tight and sensitive AFP surveillance system in the country. Every child under 15 years of age with acute flaccid paralysis should be detected and investigated to certify that the case is non-polio AFP. Detection of AFP solely depends on the clinicians i.e. paediatricians and physicians. Although more than three fourths of our AFP case load consists of Guillain-Barre' Syndrome, several other diseases can present as Acute Flaccid Paralysis. This article deals with differential diagnosis of Acute Flaccid Paralysis.

Differential diagnosis of acute flaccid paralysis is logically approached with reference to possible anatomical sites of the lesion. Causes are initially divided into lower motor neurone disorders and and upper motor neurone disorders.

Upper Motor Neurone Disorders

These could produce flaccid paralysis in the acute phase.

1. Transverse/Ascending myelitis
2. Encephlitis/encephalomyelitis
3. Stroke
4. Cerebral tumours

Lower Motor Neurone Disorders

Anterior Horn Cell – Acute Poliomyelitis, Non polio virus induced paralysis (esp. enterovirus), Vaccine Associ ated Paralytic Poliomyelitis (VAPP)

Root – Acute radiculopathies

Plexus – Brachial neuritis

Nerve – Guillain-Barre' Syndrome (GBS), Toxin induced neuropathies, Acute Intermittent Porphyria, Tick paraly sis, Diphtheritic neuropathy

Neuro-muscular Junction – Myesthenia gra vis, Snake bite, Poisoning, Botulism

Muscle – Post viral myositis, Polymyositis/ dermatomyositis, Periodic paralysis

However apparent paralysis occurs with pseudo paralysis which is often due to painful conditions such as arthritis and myalgia. Hysterical paralysis also presents as apparent paralysis. Both these conditions can mimic acute flaccid paralysis although muscle weak-

(Continued on page 2)

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-ness is not present clinically.

Final diagnoses reported in cases of AFP

Guillain-Barre' Syndrome (GBS)
Transverse myelitis
Encephlitis/encephalomyelitis
Viral myositis/Myalgia
Periodic paralysis
Brachial neuritis
Bells Palsy
Cerebral tumour
Stroke
Hysterical paralysis
Pseudoparalysis
Hypocalaemia
Radiculopathy
Acute intermittent porphyria

Role of Clinical Neurophysiology in AFP Surveillance

Clinical neurological assessment helps to narrow down the possibilities. Clinical neurophysiology will aid in differentiating a lower motor neurone disorder from an upper motor neurone disorder. In the case 0f a lower motor neurone disorder it further helps to identify the exact site of the lesion. When combined with the clinical picture this often helps to arrive at the final diagnosis.

Nerve Conduction Studies (NCS) and Electromyography (EMG) are the tests mostly used in neurophysiology. NCS includes assessment of sensory and motor nerve functions and EMG assesses motor unit activation pattern in muscles. This helps to differentiate between a neurogenic lesion and a myopathic lesion. It further helps to detect the distribution of nerve involvement in the case of root, plexus or nerve lesion. Repetitive Stimulation Test is used for assessment of neuromuscular junction disorders.

Neurophysiological tests are very sensitive. If there is significant paresis due to a LMN lesion, relevant neurophysiological tests will almost always show abnormalities. If these tests are normal in the presence of significant weakness, the lesion is at the UMN level or the weakness is due to a psychogenic reason. Hence these tests are very useful in the evaluation of a patient with AFP. Early assessment is essential to get the best out of neurophysiological tests. For instance, poliomyelitis and axonal type GBS give rise to the same neurophysiological picture. However, if tested early enough (within the first week ideally), neurophysiological assessment could help to differentiate between the two conditions. It also helps early administration of specific therapeutic measures if the diagnosis is GBS eg. Plasma exchange, IV immunoglobulins.

Summary of neurophysiological findings in AFP is given in the Table in page 3.

Source:

This article was based on a report by Dr Sudath Gunasekara Consultant Neurophysiologist, NHSL and Member, National Polio Expert Committee. WER team also acknowledges contributions made by Dr Paba Palihawadana Deputy Epidemiologist, Epidemiological Unit, Ministry of Health.

(Continued on page 3)

Acute Flaccid Paralysis to be gazetted as a Notifiable disease

Arrangements are under way to gazette Acute Flaccid Paralysis (AFP) as a notifiable disease by the Epidemiological Unit, Ministry of Health in accordance with the Legal Draftsman's Department of Ministry of Justice. Acute poliomyelitis was made a notifiable disease in 1944 and after initiation of the AFP surveillance programme in 1990, notification of AFP cases was made mandatory only through a government circular.

Once gazetted, medical officers are obligated by law to notify AFP cases on clinical suspicion.

New Additions to the Notification List

Along with AFP, chicken pox, mumps and meningitis have been added to the notification list and will be gazetted shortly in the same gazette notification.

Geographical location of Sri Lanka with India as its mighty neighbour may prove devastative to poliomyelitis eradication unless strict precautions are taken. With the movement of migrants and refugees from India which reported 134 cases of poliomyelitis lat year and 18 cases up to May 2005, importation of the disease is an eminent threat to the programme. Therefore a special component of the AFP surveillance programme has been initiated to monitor all migrants from South India for possible poliomyelitis cases and a mechanism is in place to give two doses of OPV immunization to all such children under 15 years of age. This activity is carried out by the MOH of the area.

Table 1: Vaccine-preventable diseases & AFP

16th - 22nd April 2005 (16th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	00	00	00	00	00	05	37	39	-5.1%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	0.0%
Measles	00	00	00	00	00	00	00	00	00	00	27	23	+17.3%
Tetanus	00	01 KD=1	00	00	00	00	00	00	01	01	10	18	-44.4%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	18	19	-5.2%
Tuberculosis	244 CB=04 KI=20 GM=220	44 KD=32 NE=12	24 HB=01 MT=10 GL=13	43 JF=04 AM=01 KM=34 MU=04	09 KR=09	14 AP=14	00	48 RP=48	426	118	3498	2134	+63.9%

Table 2: Diseases under Special Surveillance

16th - 22nd April 2005 (16th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	20	12	02	02	01	01	01	05	44	59	979	1009	-2.9%
Encephalitis	00	00	00	00	00	00	00	00	00	01	21	38	-44.7%
Human Rabies	00	00	00	00	00	00	00	00	00	00	18	25	-28.0%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HBG=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

Summary of Neurophysiological Findings in AFP

	NCS		*EMG*	*Other*
	Sensory	*Motor*		
GBS AIDP	*N/AbN*	*Latency-High MCV-N/Slow Amplitudes-N*	*Denervation*	-
GBS AMAN	*N*	*Latency-N MCV-N Amplitudes-Low*	*Denervation*	-
GBS AMSAN	*AbN*	*Latency-N MCV-N Amplitudes-Low*	*Denervation*	-
Poliomyelitis/Non polio paralysis	*N*	*Latency-N MCV-N Amplitudes-Low*	*Denervation*	-
Radiculopathy /Plexopathy	*N*	*Latency-N MCV-N Amplitudes-N/Low*	*Denervation*	-
Periodic Paralysis	*N*	*Latency-N MCV-N Amplitudes-Low*	*N/Myopathic /Silent*	-
Myositis	*N*	*Latency-N MCV-N Amplitudes-Low/N*	*Myopathic*	-
Brachial Neuritis	*N*	*Latency-N MCV-N Amplitudes-N*	*Neurogenic Regional*	-
Myasthenia gravis	*N*	*Latency-N MCV-N Amplitudes-N*	*N*	*Repititive Stim -ulation Test*
Myelitis	*N*	*Latency-N MCV-N Amplitudes-N*	*N*	-

Table 3: Selected notifiable diseases reported by Medical Officers of Health

16th - 22nd April 2005 (16th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	13	344	03	66	00	00	01	16	00	97	00	39	00	01	01	41	**54**
Gampaha	05	213	02	65	00	02	00	12	00	11	01	43	00	00	04	30	**79**
Kalutara	02	55	06	127	00	00	00	17	02	65	00	38	00	00	00	16	**70**
Kandy	11	47	02	119	00	00	01	24	00	05	00	06	01	35	02	15	**55**
Matale	01	08	00	116	00	02	01	13	00	06	00	27	00	00	01	02	**33**
Nuwara Eliya	00	02	04	132	00	00	02	59	00	02	00	04	00	10	00	08	**86**
Galle	01	08	02	32	00	00	00	07	00	02	01	22	00	03	00	02	**69**
Hambantota	00	05	03	32	00	00	00	05	00	29	03	25	00	17	00	05	**80**
Matara	01	20	04	54	00	01	01	13	00	13	02	62	00	44	00	03	**50**
Jaffna	00	04	01	32	00	00	00	120	00	10	00	00	00	70	04	30	**50**
Kilinochchi	00	00	00	00	00	00	00	00	00	02	00	00	00	00	00	00	**25**
Mannar	00	00	00	08	00	00	00	21	00	25	00	00	00	01	00	04	**67**
Vavuniya	00	17	01	35	00	01	01	133	00	02	00	01	00	00	00	03	**75**
Mullaitivu	00	00	00	03	00	00	00	04	00	01	00	00	00	03	00	01	**100**
Batticaloa	00	00	00	09	00	01	00	01	00	00	00	01	00	01	02	82	**43**
Ampara	00	04	00	28	00	00	00	01	00	04	00	05	00	00	00	01	**00**
Trincomalee	02	32	00	130	00	00	00	09	00	15	00	05	00	01	02	63	**11**
Kurunegala	00	44	04	133	00	00	00	22	00	20	00	06	00	05	03	29	**65**
Puttalam	01	67	00	21	00	02	02	59	00	03	00	03	00	00	00	08	**89**
Anuradhapura	00	24	01	47	00	01	01	13	00	24	00	40	00	12	00	23	**63**
Polonnaruwa	01	15	00	21	00	00	01	31	00	01	00	10	00	01	00	08	**86**
Badulla	01	09	04	193	00	00	03	70	00	04	02	32	00	18	04	68	**67**
Monaragala	00	01	00	47	00	00	00	12	00	00	00	60	00	19	00	21	**50**
Ratnapura	03	38	06	188	00	11	05	147	00	13	01	22	00	03	00	15	**53**
Kegalle	02	20	02	139	00	00	01	08	00	09	01	19	01	11	02	26	**50**
Kalmunai	00	02	00	13	00	00	00	05	00	00	00	00	00	00	01	08	**20**
SRI LANKA	**44**	**979**	**45**	**1790**	**00**	**21**	**20**	**822**	**02**	**363**	**11**	**470**	**02**	**255**	**26**	**512**	**57**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 30rd April 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WER SRI LANKA - 2005

Vol. 32 No. 18 **30th April - 06th May2005**

Burden of Diarrhoeal Diseases in Conflict Affected Areas

A survey on the burden of diarrhoeal diseases in conflict affected and border areas was carried out by the Epidemiological Unit of the Ministry of Health in November – December 2004. This report is based on its findings.

Diarrhoeal Diseases continue to be a major cause of disease burden, especially among the preschool children and infants in Sri Lanka. Acute complications of diarrhoeal diseases include dehydration and death. Though deaths are rare they are still being reported sporadically. Repeated episodes of diarrhoea lead to a reduction in immunity leading to repeated infections and malnutrition.

The main reasons for occurrence of diarrhoeal diseases include lack of sanitary facilities due to poor economic conditions and the failure to change unfavourable behaviours. Lack of awareness about long-term benefits of good sanitary practices, contributes to the inability to change behaviours.

In conflict-affected areas the situation is far from satisfactory. Constraints on the delivery of health services such as staff and other resources and difficulty in access has stretched the available limited preventive and control activities of diarrhoeal diseases available in these districts. Therefore the impact of diarrhoeal diseases would be more pronounced in these areas.

This survey on the burden of diarrhoeal diseases in conflict affected areas and border areas was designed to assess the diarrhoea prevalence, the level of personal hygiene of the people and to assess the sanitary facilities available for people in these areas..

Two MOH areas, namely the MOH Kahatagasdigiliya of Anuradhapura district and MOH Kinniya of Trincomalee district were selected for the survey based on notifications of Dysentery, Enteric Fever and Viral Hepatitis cases to Epidemiological Unit.

Koonwewa PHI area in Kahatagasdigiliya MOH area and Ehuthar naga GN division, Idimen GN division and Maharoof Naga GN division in Kinniya MOH area were the specific sites selected for the survey.

Cluster sampling method was used to conduct the survey. In Kinniya where 3 GN divisions were selected the largest GN division was divided into 2 cluster areas.

In Kahatagasdigiliya, the survey was conducted in four randomly selected GN divisions of the Koonawewa PHI area.

A total of 132 households were included each from Kahatagasdigiliya and Kinniya MOH areas. The chief occupant or a responsible adult in the house answered an interviewer administered questionnaire regarding details of all members of the family. He was questioned on presence of diarrhoea and dysentery among his household members over the

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past 2 weeks and presence of enteric fever and viral hepatitis in the previous year.

Prevalence of Diarrhoea, Dysentery, Enteric Fever and Viral Hepatitis

In Kahatagasdigiliya 51 household members out of the 610 had diarrhoea and 6 had dysentery. None of the household members had enteric fever or viral hepatitis during the preceding one year.

In Kinniya out of the 686 participants 23 had diarrhoea and 16 had dysentery during the previous two weeks. Three and eight persons had enteric fever and viral hepatitis respectively during the past year.

In the Demographic and Health Survey (DHS) conducted in year 2000, the prevalence of diarrhoea in the preceding two weeks among the under 5 age group was 6.7% for the entire country and 7.1% among the rural population. In this survey conducted in Kahatagasdigiliya and Kinniya two-week prevalence for diarrhoea was 8.4% and 3.4% for these two areas respectively. However the figures from DHS and these figures cannot be compared as the prevalence calculated in the DHS survey was for the under five age group alone.

Demographic characteristics

Literacy rate among householders is 85.6% in Kahatagasdigiliya and 56% in Kinniya.

Source of drinking water

An important factor contributing to the high morbidity of diarrhoeal diseases is the lack of access to safe drinking water. The survey data indicated that the majority (58.3%) of household members in Kahatagasdigiliya have common/shared wells as their water source whereas in Kinniya, 51.5% of household members got their water from private wells.

Sanitary Facilities

Just over one third (34.8%) of household members in Kahatagasdigiliya did not have access to any kind of toilet facilities. In Kinniya 41% did not have access to toilet facilities. Water seal type of toilet was the most common type used among the houses with toilet facilities. The DHS survey conducted in year 2000 revealed that in the rural sector, 95% of the households had access to some kind of toilet facility. It also revealed that out of the households which had access to toilet facilities, 86.5% had their own private toilets. Access to toilet facilities was much lower in Kahatagasdigiliya and Kinniya in contrast to the national results of the DHS 2000.

Knowledge and practices about diarrhoeal diseases

Over 80% of household members in Kahatagasdigiliya and 75% in Kinniya were aware that diarrhoea was transmitted through unhygienic food and water.

In each area, over 85% of household members had heard of "Jeevanee"(ORS) and out of them about 53% in Kahatasgasdigiliya and 60.3% in Kinniya had prepared "Jeevanee" at some point in their lives. Majority of them (66.7% in Kahatasgasdigiliya and 79.8% in Kinniya) knew that it had to be prepared with boiled cooled water.

One fourth (25%) of the people interviewed believed that fluid had to be restricted during a diarrhoeal episode. In the DHS, only 16.4% of the total participants believed in restriction of fluids and the figure was even lower among the rural sector (12.4%). About 45% of the total household members in Kahatagasdigiliya and Kinniya who participated in this survey believed that food had to be restricted during a diarrhoeal episode. This finding is somewhat similar with the DHS where 52.5% of participants were misinformed about food intake during diarrhoeal episodes.

Sanitary practices

Over four fifths of household members (83.4%) in Kahatagasdigiliya and over two third (68.6%) in Kinniya disposed excreta of infants in a sanitary way. Only 13.6% in Kahatagasdigiliya and 1.5% in Kinniya disposed excreta of infants outside unhygenically. This question was not applicable to 8.3% of people in Kahatagasdigiliya and 19.4% in Kinniya.

The presence of soap in or near the toilet and the site where hand washing was done before eating, were considered as basic sanitary measures. Only 52.3% and 36.6% of households in Kahatagasdigiliya and Kinniya respectively had soap at the site of hand washing. Only 77.5% and 44.3% at Kahatagasdigiliya and Kinniya had soap in/near the toilet respectively.

Key observations

The survey showed deficiencies in both sanitary facilities and in knowledge on sanitary practices among people in the study areas. Nearly 35% in Kahatagasdigiliya and 41% in Kinniya not having toilet facilities is a clear example of lack of sanitary facilities.

A high percentage of participants in both areas had misinformed practices regarding nutrition during diarrhoeal episodes. Approximately 45% believed in restriction of food and approximately 25% were misinformed regarding

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

23rd - 29th April 2005 (17th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	02 GM=2	00	01 MT=1	00	00	00	00	00	03	00	40	39	+2.5%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	0.0%
Measles	00	01 KD=1	00	00	00	00	00	00	01	00	28	23	+21.7%
Tetanus	00	02 KD=2	00	00	00	00	00	00	02	02	12	20	-40.0%
Whooping Cough	00	00	00	01 JF=1	00	00	00	01 RP=1	02	01	20	20	0.0%
Tuberculosis	41 CB=41	01 KD=01	00	30 JF=09 VA=06 KM=02 BT=13	00	20 PO=20	10 BD=10	43 RP=43	145	142	3643	2276	+60.0%

Table 2: Diseases under Special Surveillance

23rd - 29th April 2005 (17th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	40	18	00	03	00	00	00	08	69	153	1077	2469	-56.3%
Encephalitis	00	00	00	00	00	00	00	00	00	00	21	38	-44.7%
Human Rabies	00	00	00	00	01 KR=1	00	00	00	01	01	21	26	-19.2%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :
Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.
DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

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intake of fluids.

The combination of both factors i.e. lack of sanitary facilities and poor practices, may have contributed to the prevalence of diarrhoeal diseases obtained in this survey.

Recommendations

Improving sanitary facilities such as construction of toilets, repairing unprotected and semi-protected wells and improving knowledge of the community through conduction of focus group discussions were recommended for these areas at the end of this survey. Increasing active participation of the community in the decision making process in a sustainable manner through formation of village committees to look into diarrhoeal diseases was also suggested. Further, activities to improve knowledge among public health staff, food handlers and teachers (including preschool teachers) were considered.

It was recommended that a post intervention survey be held in the same areas to assess the benefits yielded by these interventions.

This article was based on the report presented by Dr Jagath Amarasekara of Epidemiological Unit who was the coordinator and the principal investigator of the survey. This survey was sponsored by UNICEF.

Reference: ***Demographic and Health Survey 2000.***

Table 3: Selected notifiable diseases reported by Medical Officers of Health

23rd - 29th April 2005 (17th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	24	370	02	68	00	00	02	18	00	97	01	40	00	01	00	41	**62**
Gampaha	12	227	03	68	00	02	01	13	00	11	02	45	00	00	03	35	**71**
Kalutara	04	59	07	140	00	00	02	19	00	65	02	41	00	00	01	17	**100**
Kandy	18	85	11	132	00	00	02	26	00	06	00	06	01	36	01	17	**59**
Matale	00	08	08	127	00	02	00	13	00	06	00	27	00	00	00	02	**67**
Nuwara Eliya	00	02	10	142	00	00	04	63	00	02	00	04	01	11	00	08	**71**
Galle	00	08	05	37	00	00	00	07	00	02	00	22	01	04	00	02	**56**
Hambantota	00	05	07	44	00	00	00	05	00	29	01	26	00	17	00	05	**80**
Matara	00	22	01	56	00	01	00	14	00	13	05	68	03	48	00	03	**50**
Jaffna	00	04	00	32	00	00	00	124	00	10	00	00	00	70	04	34	**50**
Kilinochchi	00	00	00	00	00	00	00	00	00	02	00	00	00	00	00	00	**25**
Mannar	00	00	00	08	00	00	00	21	00	25	00	00	00	01	00	04	**00**
Vavuniya	01	18	03	38	00	01	08	143	00	02	00	01	00	00	00	03	**75**
Mullaitivu	00	00	00	03	00	00	00	04	00	01	00	00	00	03	00	01	**00**
Batticaloa	01	01	01	10	00	01	00	01	00	00	00	01	00	01	15	97	**57**
Ampara	00	04	00	29	00	00	00	01	00	04	00	05	00	00	00	01	**29**
Trincomalee	01	33	04	141	00	00	02	11	04	19	00	05	02	03	03	72	**56**
Kurunegala	00	44	03	139	00	00	00	23	00	20	02	08	00	05	01	33	**76**
Puttalam	00	67	00	22	00	02	00	61	00	03	01	04	00	00	01	10	**67**
Anuradhapura	00	26	02	49	00	01	00	13	00	24	00	40	00	12	01	24	**74**
Polonnaruwa	00	15	00	21	00	00	02	33	00	01	00	10	00	01	00	08	**100**
Badulla	00	09	04	197	00	00	01	71	00	04	01	33	00	18	00	68	**53**
Monaragala	00	01	01	48	00	00	00	12	00	00	01	61	00	19	03	24	**30**
Ratnapura	04	42	10	200	00	11	04	154	00	13	06	30	00	03	00	15	**67**
Kegalle	04	24	04	146	00	00	01	09	00	09	03	23	00	11	02	30	**80**
Kalmunai	00	03	00	13	00	00	01	06	00	00	00	00	00	00	00	08	**30**
SRI LANKA	**69**	**1077**	**86**	**1910**	**00**	**21**	**30**	**865**	**04**	**368**	**25**	**500**	**08**	**264**	**35**	**562**	**61**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 7th May 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WER SRI LANKA - 2005

Vol. 32 No. 19 **07th May - 13th May 2005**

Stress: Girls vs. Boys

This article discusses the gender differences in emotional responses to interpersonal stress during that crucial age group - Adolescence.

The transition from childhood to adolescence is marked with the onset of new biological, psychological and social challenges. These present as a variety of novel experiences that tax the coping resources of young girls and boys and this in turn may affect their well being. These challenges usually present as stressful events and circumstances in their eyes. Children's ability to negotiate these challenges usually impact on their long term health and development.

Theory and research support a complex model of the interpersonal mechanisms underlying gender differences in emotional distress during adolescence. Many have considered the role played by stress exposure in emergence of gender differences in emotional distress. It has been known that females show increased vulnerability to anxiety and depression compared to males. This vulnerability is known to become particularly significant during adolescence and continues through adulthood.

The question of whether girls and boys encounter different experiences within their interpersonal relationships has been addressed from many different perspectives. Research on close relationships and on life stress suggests that girls may be more susceptible than boys to disruptions in their interpersonal worlds, particularly during adolescence. These differences are reflected in both the types of challenges in life that girls and boys experience, as well as in how they react to these challenges.

Form and function of an individual's relationships with peer and family members vary across gender and across development. Whereas female peer relationships tend to be characterized by high levels of self-disclosure, intimacy and emotional support, male peer relationships and friendships are often based on companionship and shared activity.

These gender differences intensify during adolescence as the peer group becomes a vital element in socialization and emotional experience and also as gender roles become more significant. Since girls rely on peers for emotional support and intimacy, the disruptions in social networks and shifts in interpersonal roles that often accompany the transition into adolescence are likely to create higher levels of stress within female relationships than within male relationships. For example, if girls attribute greater importance

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to closeness and loyalty within friendships than boys, normative changes in peer relationships would more likely lead to jealousy in female peer groups than in male peer groups.

Adolescent girls also become increasingly aware of the threat that is imposed on friendships by interpersonal conflict. Therefore more stress can arise from misunderstandings or minor disagreements within female than in male peer groups.

Within families, adolescence usually causes heightened stress in parent-child relationships, especially in daughter-parent situations. This is due to a mismatch between girls' perceptions of increased autonomy from parents and parents' reluctance to grant this degree of autonomy.

Research has revealed that adolescent girls are at increased risk for stress in their relationships peer as well as family. They are known to experience more interpersonal stress and strain which include negative events and problems involving family, peer and intimate relationships than do boys. Adolescent boys in contrast, suffer from more stressful self-relevant events than girls. Girls perceive negative interpersonal events as more stressful compared to boys. Further, adolescent girls are more likely than boys, to be preoccupied with negative thoughts about their friends and to experience negative reactions within peer and family networks.

In general, levels of stress tend to increase from pre-adolescence to adolescence. Gender differences in levels of interpersonal stress typically do not occur prior to adolescence. This indicates that the transition to adolescence represents a period of vulnerability for girls. These gender differences seem to last through adulthood, as women have been found to suffer from higher levels of stress associated with their social networks, whereas men have been known to report higher levels of stress from events such as job loss, work difficulties and legal problems.

Stress Reactivity

Interpersonal stress not only may be more prevalent in girls than boys but it also may have different consequences which are gender based. It will be interesting to know if these gender differences in the experience of stress and in emotional reactions to stress, particularly within an interpersonal context, contribute to the development of gender differences in anxiety and depression during adolescence.

Evidence is many that confirm an association between life stress and maladaptive developmental outcomes including anxiety, depression, behaviour problems and substance abuse. Although some researchers have found that girls experience higher levels of emotional distress in response to stress more than boys, other studies do not indicate similar gender differences in stress reactivity.

Stress within relationships may be an especially strong risk factor for emotional distress. Relationships with both family and friends serve a variety of functions including provision of emotional support, instrumental guidance, companionship, intimacy and opportunities for self disclosure and self validation. These may also act as buffers against stressful life experiences. Relationships are therefore likely to play a critical role in emotional well being.

Consequently, disruption in relationships may result in emotional difficulties such as anxiety and depression. Problematic relationships may interfere with the development of a healthy sense of self, leading to diminished self-worth. Both these are characteristic of anxiety and depression. Stress within relationships may also precipitate sense of helplessness and hopelessness which are again strong precursors of anxiety and depression.

Such detrimental impact of interpersonal stress may be particularly salient in girls. Since relationships are more critical to self-definition and identity in females than in males, girls have a greater tendency than boys to value close relationships and to rely on relationships as a source of emotional support. They also tend to be concerned than boys about maintaining harmonious relationships and about being evaluated positively by others. Therefore stress or conflict within relationships would be more likely to affect emotional well being in girls rather than in boys. On these arguments some authors suggest that girls may be particularly vulnerable to emotional distress as a result of interpersonal stress. They have observed a stronger association between interpersonal loss/separation events and anxiety and depressive disorders in girls than in boys. Some have documented that social stress was associated more strongly with depression in girls than in boys. Another group of researchers have established that adaptive aspects of peer relationships, such as perceived peer support, popularity and positive friendship qualities (e.g. intimacy, self-disclosure) protect girls more than boys against emotional difficulties such as depression, loneliness, and

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

30th April - 6th May 2005 (18th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	01 ML=1	00	01 MU=1	01 KR=1	00	00	01 RP=1	04	01	44	40	+9.1%
Diphtheria	00	01 KD=1	00	00	00 KR=1	00	00	00	01	00	02	01	100.0%
Measles	00	00	00	00	00	01 PO=1	00	00	01	04	30	27	+11.1%
Tetanus	00	00	00	00	00	00	00	00	00	00	12	20	-40.0%
Whooping Cough	01 CB=1	01 KD=1	00	00	01 KR=1	00	00	03 KG=3	06	00	26	20	+30.0%
Tuberculosis	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3643	2276	+60.1%

Table 2: Diseases under Special Surveillance

30th April - 6th May 2005 (18th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	34	05	04	00	02	02	01	05	53	252	1145	2721	-57.9%
Encephalitis	00	00	00	00	00	00	00	00	00	01	21	39	-46.1%
Human Rabies	01 KL=1	00	00	00	00	00	00	00	01	01	22	27	-18.5%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle. NA=Data Not Available

(Continued from page 2)

poor self-esteem.

However findings from several other studies on stress reactivity are not consistent with these theories and some researchers have not found similar gender differences between female and male adolescents linking interpersonal stress and emotional distress.

To date, researchers have assembled many pieces of the puzzle concerning the contribution of gender-linked stress related processes to gender differences in emotional distress during adolescence, have been by . Yet, the puzzle is far from solved and will require further refined research efforts.

Source:
This summary article was based on an article "Gender Differences in Emotional Responses to Interpersonal Stress during Adolescence" by Karen D. Rudolph PhD of University of Illinois, USA.
Karen D. Rudolph. Gender Differences in Emotional Responses to Interpersonal Stress during Adolescence. *Journal of Adolescent Health* 30 (2002) pp. 3-13.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

30th April - 6th May 2005 (18th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	17	391	03	74	00	00	02	20	00	97	01	41	01	03	04	46	**69**
Gampaha	15	247	07	77	00	02	01	15	00	11	03	48	00	00	04	39	**100**
Kalutara	02	61	15	155	00	00	00	19	00	65	01	42	00	00	00	17	**100**
Kandy	05	90	05	140	00	00	01	28	00	06	03	09	00	36	02	19	**68**
Matale	00	09	02	131	00	02	00	14	00	06	00	27	00	00	00	02	**83**
Nuwara Eliya	00	02	03	153	00	00	03	66	02	04	00	04	00	11	02	10	**100**
Galle	00	08	01	39	00	00	00	07	00	02	01	23	00	04	01	03	**69**
Hambantota	00	05	01	47	00	00	00	05	00	29	01	27	00	17	01	06	**90**
Matara	04	26	05	61	00	01	00	14	03	16	04	72	00	48	01	04	**57**
Jaffna	00	04	00	32	00	00	10	136	00	10	00	00	02	72	01	36	**38**
Kilinochchi	00	00	01	01	00	00	00	00	00	02	00	00	00	00	00	00	**50**
Mannar	00	00	00	13	00	00	00	21	00	25	00	00	00	01	00	05	**17**
Vavuniya	00	18	00	38	00	01	01	144	00	02	00	01	00	00	00	03	**25**
Mullaitivu	00	00	00	03	00	00	00	05	00	01	00	00	00	03	00	02	**0**
Batticaloa	00	01	00	10	00	01	00	01	00	00	00	01	00	01	05	103	**57**
Ampara	00	04	00	31	00	00	00	01	00	04	00	05	00	00	00	01	**29**
Trincomalee	00	33	05	147	00	00	00	13	05	24	00	05	00	03	03	77	**56**
Kurunegala	01	45	10	151	00	00	00	23	00	20	00	08	00	05	01	34	**71**
Puttalam	01	68	03	26	00	02	00	62	00	03	00	04	00	00	01	11	**78**
Anuradhapura	02	28	00	49	00	01	00	14	00	24	04	44	00	12	02	27	**84**
Polonnaruwa	00	15	00	21	00	00	00	33	00	01	00	10	00	01	01	09	**86**
Badulla	00	10	10	212	00	00	06	85	00	04	01	34	03	22	03	72	**100**
Monaragala	01	02	09	63	00	00	00	12	00	03	00	63	01	21	02	29	**80**
Ratnapura	04	50	19	227	00	11	01	161	00	13	02	33	00	03	00	16	**73**
Kegalle	01	25	17	172	00	00	01	10	00	09	01	24	01	12	02	32	**90**
Kalmunai	00	03	02	15	00	00	00	06	00	00	00	00	00	00	06	14	**40**
SRI LANKA	**124**	**1145**	**118**	**2088**	**00**	**21**	**26**	**915**	**10**	**381**	**22**	**525**	**08**	**275**	**42**	**617**	**72**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 14th May 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WEEKLY EPIDEMIOLOGICAL REPORT
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WER SRI LANKA - 2005

Hand Foot and Mouth Disease

Dermatologists from Lady Ridgeway Children's Hospital (LRH) reported an increase in the number of Hand Foot and Mouth Disease cases seen at the hospital in March 2005. This prompted an investigation and initiation of a special reporting system to obtain details of the cases reported since Hand Foot and Mouth Disease is not a notifiable disease in Sri Lanka. This article describes the epidemiology of the disease.

Hand foot and mouth disease (HFMD) is mainly an illness of infants and children. It is caused by one of a group of enteroviruses. It is different to hoof and mouth disease in cattle, sheep and swine mainly due to the causative agent.

Infectious Agent

Several different viruses act as causative agent for Hand Foot and Mouth disease . The main aetiological agent is Coxsackie Group A type 16. Coxsackievirus is a subgroup of the enteroviruses and is a member of the family Picornaviridae. Coxsackievirus A types 4,5,9 and 10 are also known to cause Hand foot and mouth disease occasionally. Enterovirus 71 and Coxsackie virus types 2 and 5 have also been implicated in cases as well as outbreaks of Hand foot and mouth disease .

Reservoir

Humans are the only known reservoir for Coxsackie virus.

Occurrence

The disease occurs worldwide both sporadically and in epidemics. It is seen mainly among children under 10 years of age. However, adult cases are not unusual and young adults also are affected. Outbreaks have been reported from Singapore, Malaysia and Taiwan recently.

Mode of Transmission

Hand Foot and Mouth disease is moderately contagious. The disease spreads through direct contact with aerosol droplets, nasal discharge, throat secretions, faeces and vesicular fluids of infected persons. It can also spread through indirect contact with articles contaminated by secretions of infected patients. Reliable evidence of spread via pets, insects, water and food are not available.

Incubation Period

Incubation period of Hand foot and mouth disease usually ranges from 3-5 days.

Period of Communicability

An infected person is most contagious during the first week or the acute phase of the illness. However this period of communicability may be longer, since the virus persists in stools for several weeks.

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Immunity

Infection results in immunity for the specific virus that caused the infection, but a second infection is possible from a different strain of virus of the same enterovirus family.

Clinical Features

Hand Foot and Mouth Disease is an acute self-limiting disease characterised by fever, diffuse oral lesions and a vesicular skin rash. The disease begins with a mild fever, loss of appetite, malaise and frequently a sore throat. One or two days after the onset of fever, small red spots occur in the mouth, which develop into blisters and then they often become ulcers. These lesions are usually found on the buccal surface of the cheeks, gums and sides of the tongue.

Simultaneously, a non-pruritic vesicular rash develops over a day or two. This rash occurs mainly on the palms, fingers and soles of the feet. Occasionally, lesions may appear on the back of the elbows, front of the knees and on the buttocks. This may be the reason for the nomenclature, "Hand-foot-mouth-butt disease". The papulovesicular lesions may persist from 7 to 10 days. A person with Hand Foot and Mouth Disease may have only the rash or only the mouth ulcers. The illness is typically mild and it usually resolves in 7-10 days.

Complications

Complications are rare. They include aseptic meningitis, encephalitis, paralytic disease and viral myocarditis. The danger symptoms and signs are neck pain, drowsiness, vomiting, persistently high fever and difficulty in breathing and signs of dehydration.

Deaths from Hand Foot and Mouth Disease have been reported. Fifty deaths were reported from Malaysia in 1997 and 78 from Taiwan in 1998. The victims were mainly young children.

Diagnosis

The diagnosis is mainly clinical based on the appearance of the vesicular rash on the hands, feet and mouth in a child with a mild febrile illness. However oral lesions should be differentiated from stomatitis caused by herpes simplex virus, which are deeper, larger and more painful ulcerative lesions and commonly located in the anterior part of the mouth.

Laboratory Diagnosis

Specific laboratory tests are available to confirm the diagnosis. Stools are the most important specimen for virus isolation, as the virus content in stools is high and the period of viral excretion is long. Other specimens such as CSF and swabs from oral ulcers or vesicular skin lesions sent in appropriate transport medium (Hank's virus transport medium), can also be used for virus isolation.

Treatment

There is no specific treatment for Hand Foot and Mouth disease. Symptomatic treatment is given to provide relief from fever and pain from mouth ulcers. Salt water mouth rinses (half-teaspoon of salt to one glass of warm water) may be soothing if the child is able to rinse without swallowing. Although swallowing may be painful, the child should be encouraged to take adequate quantities of fluids to avoid dehydration.

Methods of Control

(1) General Preventive Measures

Person to person contact should be restricted if possible and ventilation should be improved. Hand washing and other general personal hygienic measures should be promoted.

(2) Control of Infected Persons and Contacts

Infected children should be kept away from child-care centres, schools and other crowded public places during the first few days of the illness. Nose and throat discharges of infected persons should be disinfected. Careful attention should be paid to prompt hand washing especially after diaper changes and when handling discharges, faeces and soiled articles. Quarantine is not recommended. Specific immunization against the disease is not available.

Hand Foot and Mouth Disease

- Is caused by one of several types of viruses.
- Anyone can get Hand Foot and Mouth Disease, but mainly children under 10 years are affected.
- Usually spreads through person-to-person contact.
- The symptoms are similar to a common cold with oral ulcers and a rash.
- There is no specific treatment other than symptomatic relief measures.

Table 1: Vaccine-preventable diseases & AFP

07th - 13th May 2005 (19th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	01 GL=1	00	00	00	00	00	01	01	45	41	+9.7%
Diphtheria	00	00	00	00	00	00	00	00	00	00	02	01	+100.0%
Measles	00 CB=1	00	00	00	00	00	00 BD=1	00 RP=1	03	03	33	30	+10.0%
Tetanus	01 CB=1	00	01 MT=1	00	00	00	00	00	02	01	15	21	-28.5%
Whooping Cough	00	00	00	00	01 PU=1	00	00	01 KG=1	02	02	30	22	+36.3%
Tuberculosis	NA	NA	NA	NA	NA	NA	NA	NA	NA	272	3643	3371	+8.1%

Table 2: Diseases under Special Surveillance

07th - 13th May 2005 (19th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	26	04	02	02	03	02	00	02	41	172	1192	2893	-58.7%
Encephalitis	00	00	01 GL=1	00	00	00	00	00	01	00	22	39	-43.6%
Human Rabies	00	00	00	00	00	00	00	00	00	01	22	28	-21.4%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :
Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.
DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle. NA= Data Not Available

(Continued from page 2)

Last outbreak in Sri Lanka was reported in year 2000. During the last two weeks of October 2000, 1468 suspected Hand Foot and Mouth Disease cases were reported from Out Patients' Departments of 24 hospitals in 7 districts of the country. Over 70% of these cases were reported from the Colombo district mainly from the Lady Ridgeway Children's Hospital and two large private hospitals in the city.

During the month of November 2000, 447 cases of HFMD were reported from 12 districts. Eighty three of these cases were from Kegalle district which did not report a single case in the previous month. From Colombo district, 140 cases were reported. There were no deaths or complications reported during this outbreak.

Source:

This article was adapted from a report written by Dr J P A Puvimanasinghe, Dr D S Rajasingham, Dr T A Kulatilaka. The former two officers were assistant epidemiologists at the Epiodemiological Unit at the time of writing the report. Dr Kulatilaka was formerly the epidemiologist of the Unit.

Table 3: Selected notifiable diseases reported by Medical Officers of Health
07th - 13th May 2005

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	17	412	11	88	00	00	01	23	00	97	00	41	00	03	07	53	**85**
Gampaha	06	253	12	89	00	02	00	15	00	11	01	49	00	00	03	42	**79**
Kalutara	03	64	16	171	00	00	01	20	03	68	00	42	00	00	00	17	**90**
Kandy	04	94	02	143	00	00	00	28	00	06	02	11	01	38	01	20	**68**
Matale	00	09	11	143	00	02	00	14	00	06	00	27	00	00	00	02	**67**
Nuwara Eliya	00	02	06	159	00	00	04	70	00	04	00	04	00	11	00	10	**86**
Galle	00	08	04	44	01	01	00	07	00	02	00	23	00	04	01	04	**88**
Hambantota	01	06	02	52	00	00	00	05	00	29	00	29	00	19	00	06	**100**
Matara	01	27	05	66	00	01	01	15	05	21	02	74	03	51	00	04	**71**
Jaffna	00	04	00	34	00	00	03	159	00	10	00	01	00	75	06	42	**63**
Kilinochchi	00	00	00	01	00	00	00	00	00	02	00	00	00	00	01	01	**25**
Mannar	00	00	00	15	00	00	00	22	00	25	00	00	00	01	00	05	**17**
Vavuniya	00	18	01	39	00	01	02	149	00	02	00	01	00	00	00	03	**75**
Mullaitivu	00	00	00	06	00	00	00	05	00	01	00	00	00	03	00	02	**100**
Batticaloa	00	01	00	10	00	01	00	01	00	00	00	01	00	01	04	118	**71**
Ampara	00	05	01	32	00	00	00	01	00	04	01	06	00	00	00	01	**29**
Trincomalee	02	35	08	158	00	00	01	14	00	24	01	06	00	03	03	81	**44**
Kurunegala	03	49	03	155	00	00	00	23	12	32	01	09	00	05	06	40	**82**
Puttalam	00	68	00	28	00	02	01	66	00	03	00	04	00	00	00	11	**56**
Anuradhapura	01	29	02	52	00	01	00	14	00	24	00	45	01	13	00	27	**53**
Polonnaruwa	01	16	00	21	00	00	06	39	00	01	00	10	00	01	00	09	**86**
Badulla	00	10	05	217	00	00	02	87	00	04	02	36	03	25	02	74	**73**
Monaragala	00	02	00	63	00	00	00	12	00	03	00	63	00	21	02	31	**70**
Ratnapura	00	50	17	246	00	11	04	167	00	13	03	36	02	05	00	17	**80**
Kegalle	02	27	06	181	00	00	00	10	00	09	05	30	01	13	06	38	**90**
Kalmunai	00	03	00	15	00	00	00	06	00	00	00	00	00	00	01	15	**40**
SRI LANKA	**41**	**1192**	**112**	**2228**	**01**	**22**	**26**	**972**	**20**	**401**	**18**	**548**	**11**	**292**	**43**	**673**	**70**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 21 th May 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WER SRI LANKA - 2005

Vol. 32 No. 21 **21st - 27th May 2005**

Surveillance of pneumococcal infections

SAPNA, the Sanskrit word meaning "dream" is the acronym for the "South Asian Pneumococcal Alliance". Out of the eight countries in South Asia, Nepal, and Sri Lanka are the current members of the alliance along with India, the founder member.

The goal of the alliance is to learn details and the burden of the pneumococcal disease to improve the care of children and to allow effective treatment and prevention in one of the most populated region in the world – South Asia.

Pneumococcal diseases are common and caused by the bacteria *Streptococcus pneumoniae.* Some infections go on to become severe diseases such as pneumonia, meningitis and sepsis, but most infections present as less severe, more common illnesses such as mild respiratory infections or ear infections . Worldwide, this is a significant cause of illness, hospitalization, and death. Despite appropriate antimicrobial therapy, pneumococcal infections remain associated with significant mortality. When compared the pre-antibiotic and post-antibiotic eras, similar mortality rates can be observed during the first few days of the disease in patients with bacteremic pneumonia.

Young children and elderly adults are particularly prone to infections with *S pneumoniae.* With the exception of sinusitis, pneumococci rarely infect healthy adults and teenagers. The mortality of pneumococcal infections varies widely among age groups and diseases.

Globally, acute respiratory diseases cause 1.8 million childhood deaths annually. The contribution that invasive pneumococcal diseases represent among all ARI deaths is unclear in many countries but limited studies suggest their burden is high particularly in developing countries or developing areas where healthcare access is limited. In children living in the developing world, the incidence of invasive pneumococcal disease is several times higher than the incidence in industrialized countries.

Pneumococcal meningitis is the most severe form of pneumococcal disease and one of the most fatal childhood illnesses. In developing countries, it kills or disables 40% to 75% of the children who become infected.

In Canada, population based surveillance studies for invasive pneumococcal disease revealed an overall incidence between 11.8 – 16.1 cases per 100,000 persons between 1995-1997. In the United Kingdom, pneumococcus is responsible for 30-50% of community and 8% of nosocomial pneumonia, and it may be the cause of most cases of pneumonia with no identified causative organism.

Pneumococci was estimated to cause 60-90% of lower respiratory tract infections in Gambian children younger than 5 years and as many as 100 cases per 1000 population in adult South Africans living in crowded mining communities.

In addition to the "direct" effect of pneumococcal infections in causing hospitalizations, deaths and disability, efforts by parents and providers to empirically treat pneumococcal infections in many countries has contributed to escalating

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Clinical presentation of *S. pneumoniae*.

- Upper respiratory tract infections
  - Sinusitis
  - Acute otitis media
  - Tracheobronchitis
- Lower respiratory infections
  - Broncho-pneumonia
  - Pneumonia, with or without bacteremia or empyema
- Other infections
  - Primary bacteremia in children
  - Meningitis
  - Spontaneous bacterial peritonitis
  - Sepsis with tissue seeding (septic arthritis, myositis, pericarditis, osteomyelitis, endocarditis)

levels of single and multiple drug resistance in pneumococcal isolates. Infections with drug-resistant strains of pneumococcus may be compounded by limited access to healthcare services in many areas and concomitant community-acquired viral respiratory disease (e.g. influenza) or immune suppressive conditions such as tuberculosis.

In Asian countries, acute lower respiratory tract infections, acute central nervous system diseases and sepsis are important causes of severe disease that have been documented in both national health surveys and studies among hospitalized children. In addition, recent Asian studies have confirmed that *S. pneumoniae* and *H. influenzae, N. meningitidis* and other s are leading causes of invasive bacterial meningitis. In recent years in several Asian countries, the landscape of clinical and microbiologic practice has changed as both national and international scientific agencies accumulate new evidence of the contribution that invasive pneumococcal disease tends to total hospitalizations, clinical sequelae leading to disability or increasing levels of antimicrobial resistance among clinical isolates.

Antibiotic resistance has clinical as well as economic consequences. Indiscriminate use of antibiotics leads to increased resistance and threatens the effectiveness of existing therapy, which in turn increases the cost of treatment by requiring the use of more expensive antibiotics.

Although *S. pneumoniae* is the probable cause for a significant proportion of all severe pneumonia and of childhood meningitis mortality in developing countries, limited data are available on the epidemiology of disease in such countries. In Sri Lanka, no studies have been conducted on invasive pneumococcal disease. As a result, prevention of pneumococcal disease is not a widely established public health priority in many of the developing countries. Understanding of the burden of pneumococcal disease will enable decision makers to weigh various options for making the best use of limited resources.

In the Lady Ridgeway Hospital for Children, in the year 2002, there have been 177 confirmed cases of bacterial meningitis with 12 deaths giving a case fatality rate of 7%. Similarly, 921 cases of pneumonia with 55 deaths also have been reported in the same year. Pneumococcal infection can be the underlying reason for a sizable proportion of these cases.

With this background joining the SAPNA is timely for Sri Lanka. Since year 2003 Sri Lanka was involved in developing standard protocols and procedures in studying pneumococcal burden in South Asian region. January 2005 marked a special milestone for Sri Lanka, starting the pneumococca surveillance activities at the Lady Ridgeway Hospital for Children in Colombo with the coordination of the Epidemiological Unit.

Data on pneumonia disease burden and characterization of pneumococcal isolates will provide policy makers and program managers in Sri Lanka with critical information to define adequate preventive measures for pneumococcal disease, including the potential use of the new pneumococcal conjugate vaccines.

Children who are between 02 months and 05 years of age admitted to the Lady Ridgeway Hospital for Children from 1st January 2005 will form the study population. In suspected cases of septicaemia and in suspected meningitis patients lumber puncture will be performed and CSF samples are sent for

Pneumococcal Vaccine

Two types of pneumococcal vaccines are currently in use. The older is a 23-valent pneumococcal polysaccharide vaccine. Many of the polysaccharides contained in the vaccine are not immunogenic in children less than 2 years of age and may not be immunogenic for all serotypes until children are 5 years old. Therefore, this vaccine is not recommended for infants. It is recommended only for adults and children above 2 years who are at increased risk of invasive pneumococcal disease. In addition there is only a limited protection to persons with certain underline diseases including HIV and other immune-deficiencies. Polysaccharide vaccines also have not been demonstrated to reduce mucosal carriage of *S. pneumoniae,* protect against mucosal infections and otitis media, or limit the spread of resistant strains.

The vaccine is given as a single dose of 0.5 ml. intramuscularly or subcutaneously. A booster is indicated after 3 years for children less than 10 years of age and after 5 years for those who are older than 10 years.

The recently developed pneumococcal conjugate vaccine is composed of the purified polysaccharides of the capsular antigens of *S. pneumoniae.* These vaccines contain one to 11 serotypes and various protein carriers that are immunogenic in healthy infants. Infants vaccinated with a three-dose primary series beginning at 2 months of age with doses separated by 4 to 8 weeks develop a 3 to 20 fold increase in serum antibodies for vaccine serotypes. Serum antibody response to some conjugate vaccine serotypes are substantial after one to two doses while with others consistent responses require the completion of three doses. There is evidence that conjugate pneumococcal vaccines are safe, immunogenic and elicit a higher antibody titre than polysaccharide vaccines in infants and children with HIV. It is also shown that otitis prone children and those with recurrent respiratory infections develop a higher IgG response with one dose of conjugate pneumococcal vaccine than with polysaccharide vaccine.

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

14th - 20th May 2005 (20th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	00	00	01 BD=1	00	01	01	46	41	+12.2%
Diphtheria	00	00	00	00	00	00	00	00	00	00	02	01	+100.0%
Measles	00	00	00	00	00	00	00	00	00	01	33	30	+10.0%
Tetanus	00	00	00	00	00	00	00	00	00	02	15	24	-37.5%
Whooping Cough	01 GM=1	00	00	00	00	00	00	01 KG=1	02	01	32	23	+39.1%
Tuberculosis	244	44	24	43	09	14	00	48	426	248	3498	3034	+15.3%

Table 2: Diseases under Special Surveillance

14th - 20th May 2005 (20th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	29	10	00	00	02	01	00	02	44	221	1241	2965	-58.1%
Encephalitis	00	00	00	00	00	00	00	00	00	03	22	43	-48.8%
Human Rabies	00	00	00	00	00	00	01 BD=1	00	01	01	23	29	+20.7%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

microbiology, biochemical and microscopy and in addition to Latex Agglutination for bacterial antigens.

Blood cultures in suspected septicaemic patients will be carried out. The necessary facilities and technology with supplies are provided to the LRH microbiology laboratory. The clinicians are encouraged to take blood for culture more frequently than to the past.

The financial support for SAPNA is from GAVI—ADIP, coordinated through John Hopkins University and Christian Medical College, Vellore, India.

The WER team wishes to acknowledge Dr B.K.R. Batuwantudawe, the Principal Investigator of the SAPNA Project in Sri Lanka for the information provided for this article.

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WHO. Pneumococcal Vaccines. http://www.who.int/vaccines/en/pneumococcus.sthml. Accessed on 11.05.2005

Results of the first four months of the study period in Sri Lanka

	January	February	March	April
Total number of recruits	87	121	107	98
Number of isolates of *S. pneumonia**	01	01	03	01

*All isolates were from blood cultures except for in March where there were isolates from one pus culture and one CSF culture

Table 3: Selected notifiable diseases reported by Medical Officers of Health

14th - 20th May 2005 (20th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	18	430	06	94	00	00	02	25	00	97	00	41	00	03	02	55	**46**
Gampaha	07	260	07	96	00	02	00	15	22	33	02	52	00	00	00	43	**64**
Kalutara	04	69	07	182	00	00	00	20	00	68	00	42	00	00	00	17	**60**
Kandy	10	104	10	201	00	00	01	29	01	07	01	12	00	38	00	20	**50**
Matale	00	09	02	148	00	02	01	15	00	07	00	27	00	00	00	02	**42**
Nuwara Eliya	00	02	04	163	00	00	03	76	00	04	00	04	00	11	00	10	**57**
Galle	00	08	02	46	00	01	00	07	00	02	00	23	00	04	00	04	**44**
Hambantota	00	06	03	55	00	00	00	05	00	29	03	32	02	21	00	06	**60**
Matara	00	27	05	84	00	01	00	16	00	21	03	79	03	55	00	04	**29**
Jaffna	00	04	00	34	00	00	00	159	00	10	00	01	00	75	00	42	**13**
Kilinochchi	00	00	00	01	00	00	00	00	00	02	00	00	00	00	00	01	**00**
Mannar	00	00	01	16	00	00	03	25	00	25	00	00	00	01	00	05	**83**
Vavuniya	00	19	02	41	00	01	00	149	00	02	00	01	00	00	00	03	**50**
Mullaitivu	00	00	00	06	00	00	00	05	00	01	00	00	00	03	00	02	**00**
Batticaloa	00	01	00	12	00	01	00	01	00	00	00	01	00	01	01	119	**29**
Ampara	00	05	00	32	00	00	00	01	00	04	00	06	00	00	00	01	**00**
Trincomalee	00	36	00	158	00	00	00	14	00	24	00	06	00	03	00	81	**00**
Kurunegala	00	49	05	161	00	00	00	23	00	32	01	10	00	05	00	40	**35**
Puttalam	02	70	00	28	00	02	04	74	00	03	00	04	00	00	00	11	**56**
Anuradhapura	01	31	00	52	00	01	00	14	00	24	00	45	00	13	00	27	**32**
Polonnaruwa	00	16	00	21	00	00	01	41	00	01	00	10	00	01	00	09	**57**
Badulla	00	10	04	222	00	00	02	89	00	04	03	39	05	30	05	79	**27**
Monaragala	00	02	01	64	00	00	01	13	00	03	00	63	02	23	02	34	**70**
Ratnapura	01	51	05	254	00	11	02	169	00	13	00	37	00	05	02	19	**33**
Kegalle	01	29	05	188	00	00	00	10	00	09	03	34	00	13	01	39	**30**
Kalmunai	00	03	02	17	00	00	01	07	00	00	00	00	00	00	00	15	**30**
SRI LANKA	**44**	**1241**	**71**	**2376**	**00**	**22**	**21**	**1002**	**23**	**425**	**16**	**568**	**12**	**305**	**13**	**688**	**40**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 28th May 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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ON STATE SERVICE

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SRI LANKA - 2005 WER

Disaster victim identification

Natural as well as man made disasters may cause large numbers of deaths in a short period of time, placing overwhelming stress on individuals and society and presenting health officials with an uncommon challenge of handling large numbers of cadavers. A similar situation may arise in epidemics of infectious diseases with high mortality. Isolated deaths due to infectious diseases may also cause uncertainties about handling of the corpse and disposal. This especially happens in situations where a person died of a highly infectious disease or the death is due to a stigmatised or feared disease.

The Indian Ocean Tsunami of 26 December 2004 created unprecedented challenges for forensic identification of dead bodies. An equally unprecedented collaboration of forensic scientists from more than 29 countries working together helped speed up the process. In Thailand, identification of victims has been carried out methodologically in a well organized manner where approximately 50% of victims were foreigners. In Sri Lanka, identification of dead was not a high priority in the acute phase. It was established subsequently and carried out with the support of foreign experts. This article describes these practices carried out in these two countries aftermath the tsunami.

As in other affected countries, in Thailand too this devastation was beyond the scope of existing mass disaster management plan. Although the initial response in first few days was not well organized, especially in dealing with dead bodies, later on the Department of Disaster Prevention and Mitigation (DPM) took responsibility and provided guidelines. This was supported by many institutes and organizations, for instance, universities, military, local government, police, public health personnel, non-government organizations and other volunteers. Forensic and other relevant professionals from other regions of the country self reported to the disaster sites. These disaster victim identification (DVI) teams consisted at least 600 persons, from Thailand and approximately 30 other countries. Without a central command for the whole disaster victim identification at the start of the disaster, each forensic team set up their temporary morgues, mostly located in Buddhist temples. Each team also prepared its relevant staff, necessary equipments and supplies as well as guidelines to follow. Initially, the forensic teams had to examine the bodies quickly as refrigerated container or method to preserve the bodies were not available. Later dry ice was used to cool bodies and refrigerated containers were procured. Bodies were stored in these containers until identified and released.

The forensic teams guided by their protocols, recorded external appearances, personal belongings and specific marks on the deceased. Photographs were taken in almost every case, mostly using digital cameras. Volunteer dentists also were deployed to the ground by the Thai Dentist Council to conduct dental examinations. DNA specimens were collected from all of the bodies.

Approximately 30 DVI teams at four morgue sites initially used different forensic protocols, including various numbering systems and methods for obtaining DNA specimens. These fac-

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tors and the long travel times between the morgue sites delayed data sharing between morgues and, consequently, victim identification. As a result, the multinational Thailand Tsunami Victim Identification committee (TTVI) was formed on January 12, 2005 to create specific, standardized protocols and procedures for DVI, based on the Interpol Disaster Victim Identification Guide and subsidiary procedures for pathology, odontology, photography, fingerprinting, reexamination, moving of bodies, chain of custody, and DNA testing of antemortem and postmortem samples (targeting 16 genetic loci). Infection control and welfare of attending workers were also duly concerned and attended in to during the process. Postmortem data were recorded on Interpol forms and matched with antemortem data (e.g., primary data such as dental, fingerprint, or DNA data and secondary data such as age, race, sex, hair color, and jewelry) compiled regarding missing persons at an information center (IMC) in Phuket. The Plass System (Plass Data Software, Holbaek, Denmark) and DNA-matching software were used to generate preliminary matches. If these matches were confirmed by a review board of Thai medical and police authorities, identification was confirmed, a death certificate issued, and the body released.

An estimated 700 bodies were identified and released by using varying protocols in place at the temporary morgues before establishment of the TTVI process. Since January 12, a total of 4,082 postmortem, and 2,164 antemortem data files had been created for matching as of March 31, 2005. From these data files, 1,112 bodies were identified. Approximately 95% of identifications were of persons aged 18 years or above. This is because little antemortem dental or fingerprint data are available for children. Therefore, their identification rely more heavily on DNA matching.

Sri Lanka adopted the Coroner system from Britain in the 18th century, along with other South Asian countries, and still uses it, with some modifications. The legal provisions for death investigation are elaborated in Sections 369–373 in the Code of Criminal Procedure, Act 15, of 1979 of Sri Lanka (available at http://www.lawnet.lk). Under the present system, death investigation is principally carried out by an Investigator into Sudden Deaths appointed by the Minister of Justice for a particular jurisdiction. On certain occasions, such as homicides and custodial deaths, the magistrates may act as investigators of death. In emergency situations, death investigation procedures may deviate from accepted norms and authority for disposal of bodies - even without post-mortem examinations – would be given to prescribed police authorities.

In Sri Lanka, the total deaths were six fold higher than that of Thailand and amounted to be above 30000. In addition, around 4250 were missing and 23000 were injured. A total of 575000 people were displaced. Most of their houses were completely or partially destroyed. Therefore, in the acute phase the major concern was on the survivors - treating injured, making them comfortable and ensuring their food, water, clothes, medicine and safety. The devastated environment had to be made a place of habitable. To this, the immediate removal of dead bodies from the disaster sites was a priority.

During the initial stages the deceased were sent to the nearest hospital morgues and within hours all available space was occupied. It was not practicable to keep such a large number of dead bodies until a formal identification is made. On the other hand the rapid deterioration of the condition of corpses also prevented them keeping for long periods. After the second day of the disaster, this caused the deceased to send to mass burial sites, bypassing the hospitals. As a result, thousands of deceased had to be buried before identification or keeping adequate records of them.

An international commission was formed in mid-February to identify missing foreigners in Sri Lanka, with the participation of both local and foreign forensic experts. This commission undertook the task of continuing all the previous investigations started in the

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On the request of the Thai Ministry of Public Health (MOPH), an assessment of the worker safety, health and environment protection in temporary morgue was conducted by occupational and environmental health teams from MOPH and Centers for Disease Control (CDC). They were joined by staff from the Armed Forces Research Institute for Medical Science, Bangkok.

Their recommendations were:

- Develop a site safety plan that has a clear chain of command.
- Develop an emergency-care plan for splash, sharps and other injuries.
- Configure and construct space for optimal worker and environmental safety (e.g., control access between public and DVI areas, separate food and beverage areas from DVI, and ensure an adequate number of hand-washing stations and the ability to flush eyes or other mucosal surfaces).
- Ensure appropriate use and disposal of personal protective equipment (PPE).
- Avoid inappropriate use of PPE and ensure adequate supply of refreshments to prevent dehydration.
- Limit use of sharps, avoid generation of infectious aerosols, and minimize use of oscillating bone saws. Use face shields and surgical masks as needed.
- Reduce trip hazards (e.g., electrical wires and open drains).
- Prevent musculoskeletal injuries (e.g., avoid overhead lifting, use wheeled carts to transport bodies, and reduce pinch hazards).
- Vaccinate workers appropriately.
- Ensure appropriate handling and decontamination of autopsy-related waste (e.g., use appropriate containers for sharps and biohazardous waste, then autoclave or incinerate; dispose of liquid waste in municipal waste treatment plants or other approved disposal location).
- Develop a worker registry for site security and follow-up.
- Provide social and psychological counseling.
- Educate and train staff members regarding personal safety and site safety (e.g., correct use of PPE and procedures to follow in case of injury). Designate training staff and monitors and maintain training records.
- Develop and distribute fact sheets to staff members and the public regarding the low risk for infection from bodies, air, or properly handled waste in temporary morgues.

Table 1: Vaccine-preventable diseases & AFP

21st - 27th May 2005 (21st Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	00	00	00	00	00	01	46	42	+09.5%
Diphtheria	00	00	00	00	00	00	00	00	00	00	02	01	+100.0%
Measles	00	00	00	00	00	00	00	00	00	02	33	34	-02.9%
Tetanus	00	00	00	00	00	00	00	00	00	00	16	24	-33.3%
Whooping Cough	00	00	00	00	00	00	00	02 KG=2	02	01	34	24	+41.7%
Tuberculosis	41	01	00	30	00	20	10	43	145	108	3783	3142	+20.4%

Table 2: Diseases under Special Surveillance

21st - 27th May 2005 (21st Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	32	03	01	04	00	02	02	09	53	227	1335	3362	-60.3%
Encephalitis	00	00	00	03 KM=3	00	00	00	01 RP=1	04	02	26	44	-40.9%
Human Rabies	00	00	00	00	00	00	00	00	00	03	22	32	-31.3%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

search for missing foreigners, including exhumations in many parts of the country. The distinguishing feature of the commission's involvement was performing complete autopsy examinations and identification procedures on all suspected bodies of missing foreigners. This commission functioned until April, and many foreigners were positively identified following secondary (specific) investigations such as DNA profiling.

These experiences demonstrate the need of an established national system for disaster victim identification. This includes rapid mobilization of personnel, corpse storage and examination, ante mortem data collection, data management, and family assistance. Since Sri Lanka has one of the best medico-legal systems in the region, this would not be difficult to materialize.

Source:

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Table 3: Selected notifiable diseases reported by Medical Officers of Health

21st - 27th May 2005 (21st Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	21	457	02	100	00	00	01	26	00	97	00	41	00	03	03	58	**62**
Gampaha	08	272	01	98	00	02	01	19	00	34	03	55	00	00	02	45	**71**
Kalutara	03	77	15	207	00	00	00	20	00	69	01	44	00	00	01	18	**100**
Kandy	02	117	05	208	00	00	02	37	00	07	00	13	00	40	03	26	**68**
Matale	01	10	02	158	00	02	00	15	00	07	00	27	00	00	00	02	**50**
Nuwara Eliya	00	02	07	171	00	00	03	79	285	289	00	04	00	11	00	10	**86**
Galle	01	11	07	54	00	01	00	07	00	02	00	24	00	04	00	04	**56**
Hambantota	00	06	06	63	00	00	00	05	00	29	00	33	00	21	01	08	**100**
Matara	00	28	02	89	00	01	00	16	00	22	02	83	01	56	00	04	**36**
Jaffna	01	05	03	41	00	00	03	169	01	11	00	01	00	76	00	43	**88**
Kilinochchi	00	00	00	02	00	00	00	01	00	02	00	00	00	00	02	03	**50**
Mannar	00	00	00	16	00	00	03	28	00	25	00	00	00	01	00	05	**83**
Vavuniya	00	20	04	47	00	01	00	153	00	02	00	01	00	00	00	03	**50**
Mullaitivu	00	00	00	06	00	00	01	06	00	01	00	00	00	03	01	03	**00**
Batticaloa	00	01	01	14	00	01	00	01	00	00	00	01	01	02	01	130	**71**
Ampara	00	06	00	32	00	00	00	01	00	04	01	07	00	00	00	01	**29**
Trincomalee	03	39	05	169	00	00	01	16	00	24	00	06	00	03	01	83	**56**
Kurunegala	00	50	04	178	00	00	00	24	00	32	00	10	00	05	02	43	**88**
Puttalam	00	70	00	28	00	02	04	81	00	03	00	05	00	00	00	13	**67**
Anuradhapura	02	34	03	56	00	01	02	16	01	25	03	48	00	14	00	29	**58**
Polonnaruwa	00	16	01	22	00	00	04	46	00	01	01	12	00	01	02	13	**71**
Badulla	02	11	14	243	00	00	03	94	00	04	02	42	00	34	01	82	**47**
Monaragala	00	02	02	67	00	00	00	13	00	03	01	66	00	23	01	35	**80**
Ratnapura	06	64	07	276	01	12	08	185	00	14	00	39	03	08	01	20	**67**
Kegalle	03	34	10	208	00	00	00	12	00	09	04	40	00	13	03	42	**80**
Kalmunai	00	03	00	20	03	03	00	07	00	00	00	00	00	00	01	18	**60**
SRI LANKA	**53**	**1335**	**101**	**2573**	**04**	**26**	**36**	**1077**	**287**	**716**	**18**	**602**	**05**	**318**	**26**	**741**	**66**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 04th June 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WEEKLY EPIDEMIOLOGICAL REPORT
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Vol. 32 No. 23 **04th - 10th June 2005**

WER SRI LANKA - 2005

Infection hazards of human cadavers

In the last issue of the Weekly Epidemiological Report we discussed about the practices and deficiencies of dead body identification in two countries aftermath of the tsunami. This issue explores the infection hazards of human cadaver.

The belief that following a disaster, dead bodies can cause disease epidemics is a myth existing universally. Leaking of faecal matters from cadavers is common. If water sources are contaminated with these faecal matters, there is the risk of spreading gastrointestinal infections. This can be avoided by expedite removal of dead bodies from water sources and use of treated water (most practical measure in an emergency is chlorination) for human consumption. It is unlikely people to consume water contaminated with dead bodies. Other than that there are hardly any possibility cadavers to cause epidemics aftermath of disasters. However, those who handle cadavers - by means of removing from the disaster site, conducting post-mortem or burying them - are at risk of contracting infections if the dead is infected with certain types of infectious diseases at the time of the death. Relatives and others who touch and spend time with the body prior to disposal are also at risk of infections. However, this risk is not limited to disaster scenarios; infection hazards of human cadavers exist wherever or whenever a person carrying infectious agent dies.

The human body is host to many organisms, only some of those are pathogenic. There is no evidence that most of those pathogenic organisms can survive in dead tissues for longer periods. The only exception is HIV where the virus survives for many days after the death of the host. Therefore, during a short period immediately after the death, transmission of infectious agents from a cadaver to a living person may occur. Persons occupationally expose to human cadavers such as pathologists, nurses, mortuary attendants, embalmers, funeral directors are particularly at a higher risk. Unless it is due to excess handling and exposing to body fluids, there isn't an additional risk of contracting infections from a deceased than when he or she is alive.

The conditions and pathogens that cause possible risks include tuberculosis, group A streptococcal infection, gastrointestinal organisms, hepatitis B and C virus, HIV, rabies, and possibly meningitis and septicaemia (especially meningococcal). Viral haemorrhagic fevers like Ebola and yellow fever, spongiform encephalopathies such as Creutzfeldt-Jakob disease are unheard in Sri Lanka also at risk of spreading from cadavers. Microorganisms involved in the putrefaction are not pathogenic.

The occupational risk

Tuberculosis

In tuberculosis, aerosols, particles, and splashes containing tuberculous material can be generated during autopsies, particularly when power saws are used. Workers in post-mortem rooms, pathologists, and mortuary technicians are particularly at risk. However embalming of people who have died of tuberculosis is unlikely to be

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hazardous because there is little aerosol formation but, because air may be expelled from the lungs of a body when it is lifted, it is recommended that the face of the corpse is covered temporarily.

Gastrointestinal organisms

Rotavirus diarrhoea, Shigellosis, salmonellosis, enteric fever, *Escherichia coli* and cholera are among gastrointestinal diseases that can be transmitted. Because a corpse commonly leaks faeces, persons handling dead bodies are more likely to be exposed to gastrointestinal organisms than to blood borne viruses. Workers may be exposed through direct contact with the victim's body and soiled clothes, and transmission can occur via the faecal-oral route. Contamination of other equipment, such as stretchers and vehicles used for transportation or storage is also possible.

Hepatitis

Hepatitis A is transmitted by the faecal oral route and the same precautions should be taken as for other gastrointestinal pathogens. Hepatitis B is extremely infectious and is 100 times more infectious than HIV. As little as 0.00001 ml pooled serum containing indicators of intact virus particles has been shown to transmit infection. Hepatitis C is transmitted by the same routes as hepatitis B, but probably less infectious.

HIV

Hepatitis B and HIV are transmitted by similar routes. The virus survives for many days after death in tissues. Care should therefore be taken when handling material form HIV-infected cadavers or when undertaking necropsies on cadavers infected with HIV. Cadavers infected with HIV are often infected with other organisms, such as *Mycobacteria*, which may be more infectious than the HIV infection itself.

Meningitis and septicaemia

Meningitis can be caused by many organisms but the only ones that might present a hazard to those handling the dead are *Mycobacterium tuberculosis* and *Neisseria meningitidis*. Septicaemia is a terminal condition and can be caused by many different organisms (often the patient's own flora) most of which present no hazard to those who open the body or prepare it for burial or cremation. Only cases of meningococcal septicaemia or infection with group A streptococci pose a risk. Although the development of antibiotics has reduced the incidence of fatal infections with haemolytic streptococci, cases may occur among those handling the dead and may result from apparently from trivial injuries.

Reduction of risk

In general, observing standard precautions will greatly reduce the risk of acquiring infection. It is more convenient in the instances where the disease status of the deceased is available. However, in many instances this information is not be available to those who are at risk or the available information is incomplete. A number of simple measures can be taken to reduce the risk of infection associated with handling dead bodies.

Routine vaccination against hepatitis B by workers in hospital mortuaries and embalmers is advisable. Vaccination against hepatitis A is not essential but may be desirable for people who routinely handle cadavers. Since there are no vaccinations against hepatitis C and HIV and are transmitted via the same routes as of hepatitis B similar precautions should be taken.

When handling dead bodies, workers should wear gloves, especially if the bodies are badly damaged. Other personal protective equipment, such as eyewear, gowns, and masks are required where large quantities or splashes of blood are anticipated. After the procedures protective clothing should be removed and discarded into linen bin for laundering. Used gloves should be removed and kept in a suitable bag and disposed of appropriately. Where non-disposable gloves are used, they should be cleaned and disinfected. Hands should be washed routinely after each procedure and before eating. A shower should be taken before leaving the room.

Bodies received at mortuary especially directly from emergency rooms or after resuscitation procedures may contain needles or other sharps. Care should be taken to avoid needle stick and sharps injuries.

Embalming of bodies, especially when infected with hepatitis B, hepatitis C, HIV or rabies is not recommended. However, if it is essential, the undertaker should be advised to wear protective clothing - masks, gloves and boots during preparation of the body to prevent contamination. Sealing the coffin is not required. The environment and any other place or item that is contaminated with body secretions should be disinfected with 1% hypochlorite solution.

The family environment

In many instances, where the cause of death is a communicable disease, health workers are consulted on the appropriate method of handling the dead body. Primary health care worker has the responsibility of helping and directing the relatives of the deceased to avoid any possibility of contracting the illness. Death ceremonies and religious observances are essentially facilitate the grieving process of relatives and other associates, therefore should be allowed.

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

28th May - 03rd June 2005 (22nd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 KL=1	00	00	00	00	00	00	00	01	04	47	46	+02.2%
Diphtheria	00	00	00	00	00	00	00	00	00	00	02	01	+100.0%
Measles	00	00	00	01 VA=1	00	00	00	00	01	02	36	34	+05.9%
Tetanus	01 GM=1	00	01 HB=1	00	00	00	00	00	02	00	18	24	-25.0%
Whooping Cough	00	00	00	00	00	00	00	01 KG=1	01	00	34	24	+41.7%
Tuberculosis	48	54	07	36	18	08	00	12	183	249	3966	3391	+17.0%

Table 2: Diseases under Special Surveillance

28th May - 03rd June 2005 (22nd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	51	10	02	01	05	01	00	09	79	289	1404	3909	-64.1%
Encephalitis	00	00	00	00	01 KR=1	00	00	00	01	02	24	46	-47.8%
Human Rabies	00	00	00	00	00	00	00	00	00	02	23	34	-32.4%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

The body should be handed over to the relatives without any delay. They should be informed to dispose, bury or cremate as early as possible. Embracing or hugging the body is strongly discouraged. The patient clothing, bed linen, and other personal items should be washed with soap and water and boiled before reuse.

In certain instances, post exposure immunization or antibiotic prophylaxis is recommended for those who had close contacts with the deceased prior to the death; for example, those who nursed the patient. Hepatitis B and A, rabies, and cholera are among these conditions. In hepatitis B and rabies, sexual contacts were also recommended for post exposure immunization. In other instances, expert opinion should be sort assessing each case individually.

Source:

Healing T D, Hoffman P N and Young S E J. The infection hazards of human cadavers. Commun Dis Rep CDR Rev. 1995;5(5):R61-8.

Ministry of Health. Guidelines for the procedure to be followed in a case of death due to human rabies and disposal of the body. General Circular No. 01-22/2004.

Morgan O. Infectious disease risks from dead bodies following natural disasters. Rev Panam Salud Publica. 2004; 15(5): 307-12.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

28th May - 03rd June 2005 (22nd Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	27	476	03	100	00	00	00	26	00	97	01	42	00	03	01	59	**54**
Gampaha	17	289	12	110	00	02	02	21	00	34	04	59	00	00	04	49	**93**
Kalutara	07	84	19	226	00	00	03	23	00	69	09	53	00	00	01	19	**100**
Kandy	09	126	10	218	00	00	01	38	00	07	00	13	00	40	00	26	**82**
Matale	00	10	12	170	00	02	01	16	00	07	00	27	00	00	00	02	**58**
Nuwara Eliya	01	03	04	175	00	00	01	80	00	289	00	04	01	12	02	12	**86**
Galle	01	11	01	55	00	01	00	07	00	02	02	26	00	04	00	04	**63**
Hambantota	00	06	05	68	00	00	00	05	01	30	02	35	04	25	00	08	**100**
Matara	01	29	02	91	00	01	00	16	01	23	05	88	02	58	00	04	**43**
Jaffna	00	05	03	44	00	00	09	178	00	11	00	01	00	76	00	43	**63**
Kilinochchi	00	00	00	02	00	00	00	01	00	02	00	00	00	00	00	03	**25**
Mannar	00	00	00	16	00	00	01	29	00	25	00	00	00	01	00	05	**83**
Vavuniya	00	20	03	50	00	01	02	155	02	04	00	01	00	00	00	03	**100**
Mullaitivu	00	00	00	06	00	00	00	06	00	01	00	00	00	03	00	03	**100**
Batticaloa	00	01	00	14	00	01	01	02	00	00	00	01	00	02	12	142	**71**
Ampara	00	05	00	32	00	00	00	01	00	04	00	06	00	00	00	01	**14**
Trincomalee	01	40	01	168	00	00	03	19	00	24	00	06	00	03	04	87	**44**
Kurunegala	01	51	17	195	01	01	00	24	00	32	00	10	01	06	01	44	**82**
Puttalam	04	74	01	29	00	02	02	80	00	03	03	08	00	00	00	13	**67**
Anuradhapura	01	35	05	61	00	01	00	16	01	26	06	54	00	14	01	30	**63**
Polonnaruwa	00	16	01	23	00	00	00	46	00	01	04	16	00	01	03	16	**57**
Badulla	00	12	12	249	00	00	00	90	02	06	02	42	03	33	08	89	**60**
Monaragala	00	02	05	72	00	00	00	13	04	07	05	71	03	26	01	36	**80**
Ratnapura	09	73	15	291	00	12	06	191	00	14	01	40	00	08	00	20	**73**
Kegalle	00	33	00	208	00	00	00	11	00	09	01	41	00	13	00	42	**30**
Kalmunai	00	03	03	23	00	00	01	08	00	00	00	00	00	00	15	33	**70**
SRI LANKA	**79**	**1404**	**134**	**2696**	**01**	**24**	**33**	**1102**	**11**	**727**	**45**	**644**	**14**	**328**	**53**	**793**	**68**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 11th June 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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Vol. 32 No. 24 **11th - 17th June 2005**

SRI LANKA - 2005
WER

Viral haemorrhagic fevers

Since October 2004, an outbreak of Marburg virus haemorrhagic fever (MHF) is reported from the Uige Province in northern Angola. As of 5 June the Ministry of Health in Angola has reported 423 cases of MHF. Of theses cases, 357 were fatal. Unlike in previous outbreaks of this particular hemorrhagic fever (VHF), approximately 75% of reported cases were aged below 5 years. The peak of the epidemic occurred during the late March and April. Now, reporting of new cases are considerably declining.

Except for dengue haemorrhagic fever, other viral VHFs are uncommon in Sri Lanka. However, host species of some of those VHFs are living in the country. For example, in addition to the dengue haemorrhagic fever, Aedes aegypti is the host for Yellow fever . Due to the rapid mobilization of people there is a higher possibility infected people to travel into disease free territories unknowing their disease status and to cause out break of disease. Therefore, despite whether the natural reservoir of the virus is available or not all types of VHFs are important to all communities.

Viral haemorrhagic fevers refer to a group of illnesses that are caused by several distinct families of viruses. In general, the term "viral haemorrhagic fever" is used to describe a severe multi-system syndrome. Characteristically, the overall vascular system is damaged, and the body's ability to regulate itself is impaired. These symptoms are often accompanied by haemorrhage; however, the bleeding is itself rarely life-threatening. While some types of haemorrhagic fever viruses can cause relatively mild illnesses, many of these viruses cause severe, life threatening disease.

VHFs are caused by viruses of four distinct families: arenaviruses, filoviruses, bunyaviruses, and flaviviruses. Each of these families shares a number of features. In rare cases, other viral and bacterial infections can also cause a haemorrhagic fever, for example, scrub typhus.

Viruses associated with most VHFs are zoonotic. They are totally dependent on their hosts for replication and overall survival. For the most part, rodents and arthropods are the main reservoirs for viruses causing VHFs. The multimammate rat, cotton rat, deer mouse, house mouse, and other field rodents are examples of reservoir hosts. Arthropod ticks and mosquitoes serve as vectors for some of the illnesses. However, the hosts of some viruses remain unknown – Ebola and Marburg viruses are well-known examples.

Taken together, the viruses that cause VHFs are distributed over much of the globe. However, because each virus is associated with one or more particular host species, the virus and the disease it causes are usually seen only where the host species live. Some hosts, such as the rodent species carrying several of the arenaviurses, live in geographically restricted areas. Other hosts range over continents, such as the rodents that carry viruses which cause various forms of Hantavirus pulmonary syndrome (HPS) in North and South America, or the different set of rodents that carry haemorrhagic fever with renal syndrome (HFRS) in Europe and Asia. A few hosts are distributed nearly worldwide, such as the common rat. It can carry Seoul virus, a cause of HFRS; therefore, humans can get HFRS anywhere the common rat is found.

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While people usually become infected only in areas where the host lives, occasionally people become infected by a host that has been exported from its native habitat. For example, the first outbreaks of Marburg haemorrhagic fever, in Marburg and Frankfurt, Germany and in Yugoslavia, occurred when laboratory workers handled imported monkeys infected with Marburg virus. Occasionally a person becomes infected in an area where the virus occurs naturally and then travels elsewhere. If the virus is a type that can be transmitted further by person-to-person contact, the traveller could infect other people. For instance, in 1996, a medical professional treating patients with Ebola haemorrhagic fever in Gabon unknowingly became infected. When he later travelled to South Africa and was treated for Ebola HF in a hospital, the virus was transmitted to a nurse. She became ill and died. Because more and more people travel each year, outbreaks of these diseases are becoming an increasing thereat in places where they rarely, if ever, have been seen before.

Viruses causing haemorrhagic fever are initially transmitted to humans when the activities of infected reservoir hosts or vectors and humans overlap. The viruses carried in rodent reservoirs are transmitted when humans have contact with urine, faecal matter, saliva or other body excretions form infected rodents. The viruses associated with arthropod vectors are spread most often when the vector mosquito or tick bites a human, or when a human crushes a tick. However, some of these vectors may spread virus to animals, livestock, for example. Humans then become infected when they care for or slaughter the animals.

Some viruses that cause haemorrhagic fever can spread from one person to another, once an initial person has become infected. Ebola, Marburg, Lassa and Crimean-Congo haemorrhagic fever viruses are examples. This type of secondary transmission of the virus can occur directly, through close contact with infected people or their body fluids or indirectly, through contact with objects contaminated with infected body fluids. For example, contaminated syringes and needles have played an important role in spreading infection in outbreaks of Ebola haemorrhagic fever and Lassa fever.

The risk for person-to person transmission of hemorrhagic fever viruses is highest during the latter stages of illness that are characterized by vomiting, diarrhoea, shock, and often haemorrhage. VHF infection has not been reported in persons whose contact with an infected patient occurred only during the incubation period. The incubation period of VHF varies depending upon the causative agent, generally from a few days to 3 weeks.

Initial signs and symptoms often include marked fever, fatigue, dizziness, muscle aches, loss of strength, and exhaustion. However specific signs and symptoms may vary by the type of VHF. Patients with severe cases of VHF often show signs of bleeding under the skin, in internal organs, or from body orifices like the mouth, eyes or ears. However, although they may bleed from many sites around the body, patients rarely die because of blood loss. Severely ill patients may also show shock, nervous system manifestation, coma, delirium, and seizures. Some types of VHF are associated with renal failure.

Patients receive supportive therapy, but generally speaking, there is no other treatment or established cure for VHFs. Ribavirin, an anti-viral drug, has been effective in treating some individuals with Lassa fever or HFRS. Treatment with convalescent-phase plasma has been used with success in some patients with Argentine haemorrhagic fever.

With the exception of yellow fever and Argentine haemorrhagic fever, for which vaccines have been developed, no vaccines exist that can protect against these diseases. Therefore, prevention efforts must concentrate on avoiding contact with host species. If prevention methods fail and a case VHF does occur, efforts should focus on preventing further transmission from person to person, if the virus can be transmitted in this

(Continued on page 3)

Marburg haemorrhagic fever

- Marburg haemorrhagic fever is a rare illness. Its nature of extremely high fatality has drawn attention. This is caused by *Marburgvirus* of the Filoviridae family.
- There is no animal reservoir or other environmental source has been identified. Monkeys are susceptible to infection but are not considered viable reservoir hosts as virtually all infected animals die too rapidly to sustain survival of the virus. Humans are not considered part of the natural transmission cycle, their infection is accidental.
- Outbreaks and sporadic cases have been reported in Angola, Democratic Republic of Congo, Kenya, and South Africa. The initial outbreaks were in Germany and the former Yugoslavia in 1967, have been linked to laboratory work using African green monkeys imported from Uganda.
- Extremely close contact is necessary to transmission from person to person. Infection results from contact with blood or other body fluids with high virus concentration, especially when these fluids contain blood. Transmission via infected semen can occur up to seven weeks after clinical recovery.
- Incubation period: 3 – 9 days.
- All age groups are susceptible to infection, but most cases have occurred in adults.
- Clinical features. Illness caused by Marburg virus begins abruptly, with severe headache and severe malaise. Muscle aches and pains are a common feature.
- A high fever usually appears on the first day of illness, followed by progressive and rapid debilitation. A severe watery diarrhoea, abdominal pain and cramping, nausea, and vomiting begin about the third day. Diarrhoea can persist for a week. The appearance of patients at this phase has been described as showing "ghost-like" drawn features, deep-set eyes, expressionless faces, and extreme lethargy. In the 1967 European outbreak, a non-itchy rash was a feature noted in most patients between days 2 and 7 after symptom onset.
- Many patients develop severe haemorrhagic manifestations between days 5 and 7, and fatal cases usually have some form of bleeding, often from multiple sites. Findings of fresh blood in vomitus and faeces are often accompanied by bleeding from the nose, gums, and vagina. Spontaneous bleeding at venipuncture sites can be particularly troublesome. During the severe phase of illness, patients have sustained high fevers. Involvement of the central nervous system can result in confusion, irritability, and aggression. Orchitis has been reported occasionally in the late phase of disease (day 15).
- In fatal cases, death occurs most often between 8 and 9 days after symptom onset, usually preceded by severe blood loss and shock.

Table 1: Vaccine-preventable diseases & AFP

04th - 10th June 2005 (23rd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	02 CB=1KL=1	00	02 GL=1HB=1	00	00	00	00	00	04	06	51	52	+01.9%
Diphtheria	00	00	00	00	00	00	00	00	00	00	02	01	+100.0%
Measles	00	00	00	00	00	00	00	00	00	00	36	36	00.0%
Tetanus	00	00	00	00	00	00	00	00	00	00	19	24	-20.8%
Whooping Cough	01 GM=1	00	00	00	00	01 AP=1	00	00	02	00	36	24	+50.0%
Tuberculosis	55	32	61	08	04	00	20	152	332	88	4298	3479	+23.5%

Table 2: Diseases under Special Surveillance

04th - 10th June 2005 (23rd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	63	07	02	00	01	00	01	07	81	516	1494	4786	-68.8%
Encephalitis	00	00	00	01 JF=1	00	00	00	02 RP=2	03	01	27	48	-43.8%
Human Rabies	02 GM=2	00	00	00	00	00	00	00	02	02	25	38	-34.2%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

way. Because many of the hosts that carry haemorrhagic fever viruses are rodents, disease prevention efforts include controlling rodent populations, discouraging rodents from entering or lining in homes or workplaces, and encouraging safe clean up of rodent nests and droppings.

For haemorrhagic fever viruses spread by arthropod vectors, prevention efforts often focus on community-wide insect and arthropod control; in addition, people are encouraged to use insect repellent, proper clothing, bed nets, window screens, and other insect barriers to avoid being bitten.

For those haemorrhagic fever viruses that can be transmitted form one person to another, avoiding close physical contact with infected people and their body fluids is the most important way of controlling the spread of disease. Barrier nursing or infection control techniques include isolating infected individuals and wearing protective clothing. Other infection control recommendations include proper use, disinfection, and disposal of instrument s and equipment used in treating or caring for patients with VHF, such as needles and thermometers.

Scientists and researchers are challenged with developing containment, treatment, and vaccine strategies for these diseases. Another goal is to develop immunologic and molecular tools for more rapid disease diagnosis, and to study how the viruses are transmitted and its pathogenicity. A third goal is to understand the ecology of these viruses and their hosts in order to offer preventive public health advice for avoiding infection.

Source:
CDC. Viral Hemorrhagic Fevers. 2005. http://www.cdc.gov/ncidod/dvrd/spb/mnpages/dispages/vhf..htm

Table 3: Selected notifiable diseases reported by Medical Officers of Health

04th - 10th June 2005 (23rd Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	36	518	03	103	00	00	01	27	00	97	01	43	00	03	01	60	**62**
Gampaha	21	311	04	114	00	02	02	23	00	34	06	65	00	00	01	50	**86**
Kalutara	6	90	14	240	00	00	01	24	00	69	02	55	00	00	01	20	**80**
Kandy	7	133	08	226	00	00	02	40	00	07	00	14	01	41	10	36	**77**
Matale	00	10	01	171	00	02	00	16	00	07	01	28	00	00	00	02	**67**
Nuwara Eliya	00	03	17	194	00	00	06	87	00	289	01	05	00	12	01	13	**71**
Galle	01	12	02	57	00	01	00	07	00	02	01	27	00	04	00	04	**75**
Hambantota	00	06	14	82	00	00	00	05	00	30	00	35	03	28	00	08	**90**
Matara	01	30	00	92	00	01	01	17	04	27	01	92	00	60	00	04	**36**
Jaffna	00	05	03	47	01	01	18	200	00	11	00	01	02	78	01	44	**75**
Kilinochchi	00	00	00	02	00	00	00	01	00	02	00	00	00	00	00	03	**00**
Mannar	00	00	00	16	00	00	00	29	00	25	00	00	00	01	00	05	**83**
Vavuniya	00	20	02	52	00	01	01	156	00	04	00	01	00	00	00	03	**75**
Mullaitivu	00	00	00	06	00	00	00	06	00	01	00	00	00	03	00	03	**100**
Batticaloa	00	01	00	14	00	01	00	02	00	02	00	02	03	05	05	154	**86**
Ampara	00	05	00	34	00	00	00	01	00	04	00	07	00	00	00	01	**29**
Trincomalee	00	40	04	175	00	00	01	21	02	26	00	06	00	03	07	96	**56**
Kurunegala	00	51	06	201	00	01	06	30	00	32	01	11	00	06	00	44	**71**
Puttalam	01	75	00	29	00	02	05	91	00	03	00	08	00	00	02	15	**78**
Anuradhapura	00	35	02	63	00	01	00	16	00	26	02	56	00	14	01	31	**53**
Polonnaruwa	00	17	00	23	00	00	07	62	00	01	00	18	00	01	00	16	**86**
Badulla	01	14	17	282	00	00	04	99	00	06	02	47	00	37	01	91	**67**
Monaragala	00	02	03	75	00	00	02	16	00	07	01	74	00	26	00	36	**50**
Ratnapura	06	79	11	302	02	14	05	196	00	14	01	41	00	08	00	20	**80**
Kegalle	01	34	05	213	00	00	00	11	00	09	01	42	00	13	00	42	**40**
Kalmunai	00	03	00	23	00	00	00	08	00	00	00	00	00	00	05	38	**50**
SRI LANKA	**81**	**1494**	**116**	**2836**	**03**	**27**	**62**	**1191**	**06**	**735**	**21**	**678**	**09**	**343**	**36**	**839**	**66**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 18th June 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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SRI LANKA - 2005
WER

Vol. 32 No. 25 **18th - 24th June 2005**

JE vaccine - past, present and future

Japanese encephalitis (JE) is a mosquito-borne arboviral disease of major public health importance in Asia. More than 35,000 cases and 10,000 deaths are reported annually from the region but official reports undoubtedly underestimate the true number of cases. The history of this illness probably extends beyond a century as recurrent summer outbreaks of encephalitis in horses and humans, consistent with JE, had been observed in Japan since the 19th century. The first clinical case of Japanese encephalitis was recorded in 1871, and the first epidemic broke out in Japan and Korea in the summer of 1924. More than 6,000 cases, 60% fatal, were reported from Japan alone. Clinical and epidemiologic features of the illness suggest that this and subsequent outbreaks in 1927, 1934, and 1935 were epidemics of JE.

In 1924, a filterable agent from human brain tissue was isolated and in 1934, it was possible to transmit the disease experimentally to monkeys by intracerebral inoculation. The virus initially was called Japanese B encephalitis (the modifying B has fallen into disuse) to distinguish the agent from the aetiology of Von Economo's type A encephalitis, which had different epidemiologic characteristics. The mosquito-borne mode of JE transmission was elucidated with the isolation of JE virus from *Culex tritaeniorhynchus* mosquitoes in 1938 and in field studies which established the role of aquatic birds and pigs in the viral enzootic cycle.

In China, the virus was isolated from a human case in 1940. Although sporadic cases of viral encephalitis had been noted in northern Thailand before 1969, epidemic transmission of JE was first recognized that year, when an outbreak occurred in the Chiang Mai valley. In the last two decades, hyperendemic JE transmission has spread within Thailand and in 1974, the first of several epidemics was recorded in an adjacent area of the Chiang Mai valley in Burma. In Vietnam, JE has become a major public health problem in the densely populated deltas of the Mekong River in the south and of the Red river in the north.

Sporadic cases and later, epidemics of JE were first recognized on the Indian sub-continent around Vellor. Outbreaks recurred exclusively in southern India until 1978 when JE epidemics were reported for the first time in the north, in Bihar, Uttar Pradesh and West Bengal. The first case of Japanese encephalitis in Nepal was reported from Lumbini Zone in 1978. In 1985 ten districts, in 1986 thirteen districts and in 1988 all the districts of the Terai region in Nepal were affected by JE.

Vaccine development against JE virus also has a similar, relatively long history. So far, three varieties of vaccines have been developed and are in use. They are, the inactivated mouse brain derived JE vaccine, inactivated primary hamster kidney cell derived JE vaccine and live attenuated primary hamster kidney cell derived JE vaccine. However, only inactivated JE vaccine produced in mouse brain is distributed commercially and is available internationally.

Mouse brain-derived inactivated JE vaccine

This vaccine is produced in several Asian countries. So far, this is the main type of JE vaccine that is commercially available on the international market. Successive refinements of the mouse brain vaccine were introduced by research institutes in Japan leading to the current purified vaccine. This vaccine is initially prepared by subjecting the mouse brain infected with Nakayama strain of JE virus which is isolated from spinal fluid of a human case in 1935, and maintained by continuous mouse brain passage. Another JE virus strain, Bejing-1 is also used in mouse brain-derived inactivated JE vaccine production. Although both vaccines are

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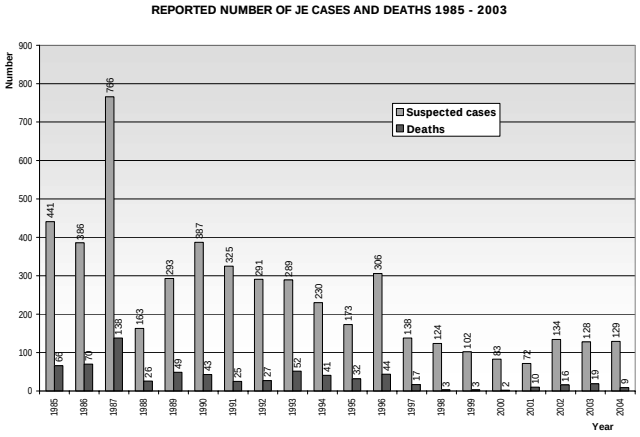
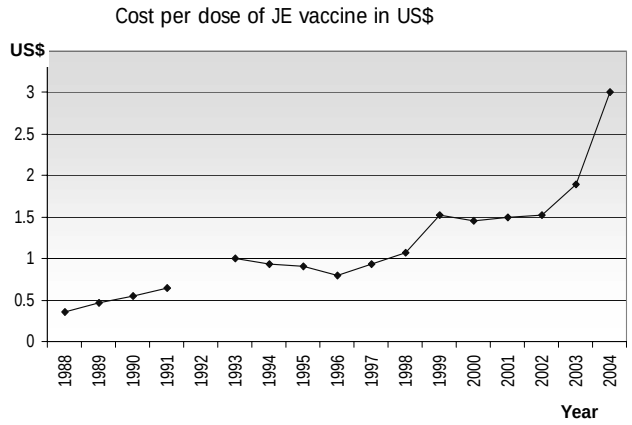
JE in Sri Lanka

In Sri Lanka the virus was first isolated in 1968. The first major outbreak was in Anuradhapura and Kurunegala districts in 1985/86 period. A total of 385 cases and 64 deaths were reported. During 1986/87 period there were 237 cases and 47 deaths in the same districts. The largest outbreak was reported in 1987/88 with 812 cases and 192 deaths.

JE immunization was introduced in 1988. Children between 1 – 10 years of age and piglets (Pig are the amplifying animal host of JE virus) in selected districts were immunized. Initially the Nakayama strain vaccine was used for immunization. In 1997, this was replaced by the Beijing strain vaccine.

With JE immunization in selected districts there was a significant reduction of cases and deaths until 2002 where outbreaks occurred in new areas (Ratnapura Deputy Provincial Director of Health Services (DPDHS) division). In 2003, JE immunization is introduced into Ratnapura DPDHS division also.





(Continued from page 1)

found to be immunogenic in humans there are no studies to compare whether one strain is better than the other. To obtain an optimum immune response, a three doses primary immunization is recommended. The first dose is given followed by the second dose one week to one month following. The third dose is given one year after the first dose to complete the primary series. To maintain the immunity for longer periods booster doses are required. However, the timing of the booster doses is different in various countries.

This vaccine is associated with varying degrees of local and systemic adverse events (ref: Weekly Epidemiological Report Vol. 32, No 10). When compared with other childhood vaccines the frequency of adverse effects following mouse brain-derived inactivated JE vaccine is high. This makes a certain proportion of the recipients in the target group to discontinue vaccination without the completion of required doses.

Mouse brain-derived inactivated JE vaccine is one of the expensive vaccines. In addition its price has gone up steadily over the time. This also is a major drawback.

Inactivated PHK cell derived JE vaccine

Attempts to produce JE vaccine in cell cultures were prompted by the desire to avoid brain antigens and allergic reactions associated with the crude vaccines and to improve immunogenicity and ease of production. This resulted in inactivated JE vaccine prepared in primary hamster kidney cells (PHK). It has been the Peoples Republic of China's principal JE vaccine since 1968. Primary hamster kidney cells were discovered to be the best of several primary and continuous cell cultures as a substrate for viral propagation. Vaccine is prepared in primary cell cultures derived from kidneys of golden Syrian hamsters. Liquid vaccine retains potency for more than 2 years at 4-8^{o}C. Primary immunization of infants with this formalin-inactivated vaccine results in about 85% protection. The vaccine is inexpensive, and 90 million doses are distributed for internal Chinese use every year.

Cell culture-derived live attenuated vaccine

This Chinese vaccine is based on a stable neuro-attenuated strain of the JE virus (SA 14-14-2). Attenuated JE viral strains have been sought by passaging wild strains serially in various cell culture systems. The vaccine's safety, immunogenicity and effectiveness has been demonstrated in field trials and was licensed in the Peoples Republic of China in 1988. Recently, Korea and Nepal also licensed this vaccine for use in their countries.

There are several advantages in the live attenuated vaccine when compared with inactivated vaccines. One is the very low occurrence of adverse effects. Tens of millions of vaccine doses of live attenuated JE vaccine have been distributed without reported complications. Close studies of experimentally immunized subjects have documented the absence of local or systemic symptoms after immunization. Specifically, headache and symptoms that might be associated with neuroinvasive infection have not been described. Nor have fever and signs and symptoms of systemic infection been conspicuous after immunization. In one study of 588,512 vaccinees, fever was recorded in 0.46% of subjects, rash in 0.08%, dizziness in 0.03% and nausea in 0.03% subjects only. It has been demonstrated that the live attenuated JE vaccine can be administered safely during infancy. Since the compliance of mothers to immunize infants are higher than when they are in older ages it would be possible to achieve a higher coverage by administering the JE vaccine during infancy.

In non-endemic areas, a single dose of this vaccine induced an antibody response in 83%-100% of children aged 6-7 years, and in older children immunized twice at intervals of 1-3

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

11th - 17th June 2005 (24th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	00	00	00	00	00	01	46	53	-13.2%
Diphtheria	00	00	00	00	00	00	00	00	00	00	02	01	+100.0%
Measles	00	00	00	00	00	00	00	00	00	02	36	39	-07.7%
Tetanus	00	00	00	00	00	00	00	00	00	03	19	27	-29.6%
Whooping Cough	01 CB=1	00	01 HB=1	00	00	00	00	00	02	01	39	25	+56.0%
Tuberculosis	66	43	17	40	04	00	00	00	170	324	4468	3803	+17.5%

Table 2: Diseases under Special Surveillance

11th - 17th June 2005 (24th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	72	20	03	01	01	00	01	17	115	649	1636	5541	-70.5%
Encephalitis	00	00	00	00	00	00	00	00	00	04	27	53	-49.1%
Human Rabies	01 GM=1	00	01 GL=1	00	00	00	00	00	02	01	29	39	-25.6%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

months, 94%- 100% showed a serological response. The high immunogenicity with single or two doses is also complimentary to vaccination programmes. This reduces the number of doses required and also the vaccine wastage there by the cost of immunization. It also ensures a better coverage.

Due to the different manufacturing processes employed, the cell culture-derived live attenuated JE vaccine is much cheaper than that of the mouse brain-derived inactivated JE vaccine. This is an added advantage of the live attenuated JE vaccine.

Epidemiological Unit is exploring the feasibility of introduction of this vaccine in Sri Lanka. It will be field trialed to identify the immunogenicity of the vaccine in Sri Lankan settings, its safety and its interaction with other vaccines if administered simultaneously. However, the already available evidence on the live attenuated JE vaccine is in favour of its introduction in Sri Lanka.

Currently JE vaccine is given only in high risk areas in Sri Lanka that include 16 DPDHS areas. Due to the high mobility of the population, children in other areas are also at risk of contracting illness. Similar to the outbreak reported in the Ratnapura DPDHS division in 2002, there is the possibility of outbreaks in areas where the disease is not usually reported. Therefore, inclusion of JE vaccine into Expanded Programme in Immunization to cover the whole country is also under consideration.

Source:

Theodore F T. Japanese Encephalitis Vaccines. http://wonder.cdc.gov/wonder/preguid/p0000008/p0000008.asp

WHO. Japanese encephalitis vaccines. Weekly Epidemiological Record. 73:337-344; 1998.

WHO. Japanese encephalitis. http://www.who.int/vaccines

Lalitha K. Control of Japanese encephalitis in India : A reality. Indian J Pediatr 2004;71:707-712.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

11th - 17th June 2005 (24th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	49	587	06	114	00	00	00	27	01	98	01	45	00	03	01	62	**77**
Gampaha	13	326	02	117	00	02	00	24	00	34	05	72	00	00	02	52	**50**
Kalutara	10	100	12	254	00	00	01	25	00	69	01	56	00	00	02	22	**80**
Kandy	18	151	07	233	00	00	07	47	00	07	05	19	02	43	01	37	**68**
Matale	02	12	00	175	00	02	00	16	03	10	01	29	00	00	01	03	**42**
Nuwara Eliya	00	03	14	208	00	00	02	92	00	289	00	05	03	15	01	14	**100**
Galle	02	16	03	60	00	01	00	07	00	02	00	27	01	05	01	06	**75**
Hambantota	00	06	06	88	00	00	00	05	00	30	01	36	02	30	01	09	**80**
Matara	01	31	01	100	00	01	01	18	00	27	01	93	01	62	00	04	**36**
Jaffna	00	05	00	47	00	01	01	204	00	11	00	01	00	78	00	44	**38**
Kilinochchi	00	00	02	04	00	00	00	01	00	02	00	00	00	00	00	03	**75**
Mannar	00	00	01	17	00	00	02	31	00	25	00	00	00	01	01	06	**83**
Vavuniya	00	20	00	52	00	01	00	156	00	04	00	01	00	00	00	03	**75**
Mullaitivu	00	00	00	06	00	00	00	06	00	01	00	00	00	03	00	03	**100**
Batticaloa	00	01	01	15	00	01	00	02	00	02	00	02	00	05	00	154	**86**
Ampara	00	06	01	35	00	00	01	02	00	04	00	07	00	00	00	01	**43**
Trincomalee	00	40	00	175	00	00	00	21	00	26	00	06	00	03	03	99	**33**
Kurunegala	01	52	05	203	00	01	02	33	02	34	00	11	00	06	00	44	**65**
Puttalam	00	75	03	32	00	02	03	94	01	04	01	09	00	00	02	17	**100**
Anuradhapura	00	36	02	70	00	01	00	16	00	26	01	60	00	16	00	31	**47**
Polonnaruwa	00	17	00	23	00	00	00	62	00	01	00	18	00	01	00	16	**71**
Badulla	01	15	11	299	00	00	03	103	00	06	00	47	00	40	01	92	**67**
Monaragala	00	02	03	78	00	00	03	19	00	07	04	78	03	32	00	38	**70**
Ratnapura	16	95	13	315	00	14	05	201	00	14	01	42	00	08	00	20	**60**
Kegalle	01	36	06	220	00	00	01	13	00	09	00	43	00	13	01	43	**40**
Kalmunai	01	04	00	23	00	00	00	08	00	00	00	00	00	00	06	45	**50**
SRI LANKA	**115**	**1636**	**99**	**2963**	**00**	**27**	**32**	**1233**	**07**	**742**	**22**	**707**	**12**	**364**	**24**	**868**	**63**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 25th June 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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Vol. 32 No. 26 **25th June - 01st July 2005**

WER SRI LANKA - 2005

Common Eye diseases

Recent estimates on the global population show a reduction in the number of people who are blind or visually impaired and those who are blind from the effects of infectious diseases, but an increase in the number of people who are blind from conditions related to longer life spans. Global estimations were that 45 million people are blind and that a further 135 million people are visually impaired. Ninety percent of the world's blind and visually impaired people live in the poorest countries of the world. However, most of the causes of blindness are avoidable. As well, the treatments available are among the most successful and cost-effective of all health interventions.

In 2003, there were 70544 admissions to government hospitals in Sri Lanka for diseases of eye and adenexa, out of which, 51% were males. Forty nine percent of the total admissions were for cataract and other disorders of lens. In almost every age group this was the single most common ophthalmic condition for hospitalization. Among aged 70 years or above this was 75%. However, this does not reflect the exact picture of the eye diseases in Sri Lanka for the reason that the majority of those having eye diseases including refractive errors need no hospitalization and were treated as out patients at clinics in government hospitals and in the private medical institutions. A certain proportion of those having refractive errors seek services of opticians bypassing both government and private medical facilities. In addition, there are reason to believe that another significant proportion of people with eye diseases including complete and partial blindness never visit any kind of healthcare facility.

Most of the common eye diseases that present to healthcare facilities in Sri Lanka are related to ageing. This include, cataract and age related macular degeneration. In addition, certain refractive errors also are more common among the elderly. Diabetic eye disease, which is also one of the commonest eye diseases in Sri Lanka are seen more frequently among elderly people.

Childhood eye diseases could be hereditary, congenital or following peri- or post-natal infections such as meningitis or due to prematurity or following trauma. They are important as the direct and indirect cost to the economy may be higher than that from eye diseases among older age groups. When considering the burden to the child's caregiver and family, and also the quality of the life of the suffering child, every effort should be taken to prevent childhood eye diseases. In case of failure, they should be detected and treated early.

Common eye diseases

Cataract: Cataract is defined as any opacity of the lens. It has been estimated that 25 percent of all people have cataract by this definition. Most lens opacities are small and do not interfere significantly with visual acuity. Cataract is responsible for blindness in more people than any other single ocular disease or condition. Cataract is not preventable, but it is surgically curable.

Most cataracts in human beings occur in older people. The precise reasons for cataract development with age are not known. The aetiology of certain types of cataract is known. Injury or trauma to the lens causes cataract. A penetration of the eyeball into the lens by a foreign body or a contusion injury to the eyeball without penetration may also lead to cataract.

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Inflammation within the eye may also be responsible for cataract formation. Metabolic conditions, such as diabetes mellitus also are associated with the early onset of cataract.

Congenital cataract, a rare condition in children, may occur at birth or develop soon thereafter. Congenital rubella syndrome is a well-known condition that is associated with congenital cataract. Also rarely, familial tendency may produce early development of cataract in childhood. Cataract is more common in tropics and the excessive exposure to sunlight (and ultraviolet in sunlight) may be the reason. Poor nutrition in developing countries may contribute to development of early cataract in some people. Certain commonly used drugs, for example, prolonged use of corticosteroids both topical to the eye and systemic, can cause cataract.

Common eye diseases in Sri Lanka

- Cataract
- Glaucoma
- Diabetic eye diseases
- Refractive errors
- Trauma and chemical burns
- Macular degeneration
- Infections (conjunctivitis and corneal ulcers)
- Medical and surgical retinal conditions

Common childhood eye diseases

- Hereditary and congenital eye diseases including cataract
- Peri- and post-natal infections
- Retinopathy of prematurity
- Refractive errors, squint
- Trauma
- Childhood malignancies

Glaucoma: Glaucoma is an ocular disease in which the intra-ocular pressure exceeds the ability of the affected eye to tolerate it. This results in visual loss by damaging the optic disc and retina. Glaucoma affects both eyes. The normal intra-ocular pressure is 10- 21 mmHg. Glaucoma may occasionally occur in an eye with a normal pressure.

Visual loss from glaucoma is irreversible. No medical or surgical treatment can restore vision which has been lost as a result of glaucoma. Visual loss first occurs in the peripheral portion of the visual field and progresses to the central visual field if the disease is not controlled. Glaucoma is possible to occur at birth (congenital glaucoma) and it may develop at any time during life.

Refractive errors: A refractive error is an optical defect of the eye which prevents light from being brought to a sharp focus by the cornea and lens on to the retina. Varying degrees of decreased vision, visual disability or blindness result, depending on type and severity of the refractive error. When refractive error is present, it is usually in both eyes, often to nearly the same degree. The number of people blind and visually disabled from uncorrected refractive errors is not known exactly.

An eye with a refractive error is called *ametropic*. There are several types of ametropia. *Myopia* is the condition when people are said to be 'short-sighted' or 'near-sighted' because they have good vision at close quarters but poor in distance vision. In myopia, the image is brought to focus in front of the retina. Basically, the problem is that the eye ball is too long for the power of the lens and the cornea. If myopia develops in childhood, it usually progresses until body growth is completed. When adult growth stops, the eyeball usually ceases to grow lengthwise. Worsening of myopia then slows or stops. Myopia may also develop in adulthood with early cataract, when the lens thickens and causes light to be focused in front of the retina. Myopia is corrected with concave or 'minus' lenses.

In *hyperopia*, people are said to be 'far-sighted' because they have good vision at distance but poor vision at close range. In this condition, the eyeball is too short for the power of the lens. Most children are hyperopic (physiological hyperopia because it is normal in childhood) and the degree of hyperopia is gradually lessened as the child grows older and approaches puberty. Primary angle closure glaucoma is more frequent in people with hyperopia. Hyperopia is corrected with convex or 'plus' lenses.

In the normal ageing process *presbyopia* occurs. The lens loses its elasticity with age. In time, the lens can no longer accommodate well enough to focus the image in the retina at close range. Most people first notice this when presbyopia creates difficulty in reading. In a person with no previous refractive errors, this occurs at approximate age of 40 years. Presbyopia is corrected with convex lenses.

The central corneal surface normally is spherical. If it is non-spherical the image is brought to focus at two different points. This condition is called *astigmatism*. It is corrected by cylindrical lenses.

Macular degeneration: Macular degeneration usually occurs in older patients but certain types of hereditary macular degeneration may occur in young patients. In macular degeneration the central visual acuity affects but peripheral vision is preserved. Macular degeneration is usually bilateral. The macula loses its normal bright reflex and becomes darkly pigmented. The area of macular degeneration may be elevated if abnormal blood vessels grow into the macular area. Surgery or cure for macular degeneration are not possible but special 'low vision' spectacles can aid the patient, particularly for reading and close visual work.

Trauma: All eye injuries are considered ophthalmic emergencies and must be managed immediately and correctly. Direct injuries to the eye may result from common everyday activities such as cultivating, harvesting, and collecting and splitting firewood. Industrial eye injuries occur when protective eyewear are not worn when eye protection is required on the job. Facial and eye injuries resulting from automobile accidents are increasing worldwide. Personal physical assault is a cause of ocular adenexa injury, penetrating injury to the eyeball and of orbital fractures.

Eye infections: External ocular infection - trachoma, bacterial conjunctivitis and corneal ulcer, *Herpes simplex* corneal

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Table 1: Vaccine-preventable diseases & AFP

18th - 24th June 2005 (25th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	03 GM=2KL=1	01 KD=1	01 MT=1	01 JF=1	00	00	00	01 RP=1	07	04	58	57	+01.8%
Diphtheria	00	00	00	00	00	00	00	00	00	00	02	01	+100.0%
Measles	00	00	00	00	00	00	00	00	00	02	36	41	-12.2%
Tetanus	00	00	00	00	00	00	00	00	00	01	19	28	-32.1%
Whooping Cough	02 CB=2	00	01 HB=1	00	00	00	00	00	03	00	43	29	+48.3%
Tuberculosis	04	01	08	33	18	00	05	00	69	133	4537	3936	+15.3%

Table 2: Diseases under Special Surveillance

18th - 24th June 2005 (25th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	44	03	01	00	00	00	01	04	53	720	1723	6444	-73.3%
Encephalitis	00	00	00	00	00	00	00	00	00	04	28	58	-51.7%
Human Rabies	00	00	00	00	00	00	00	00	00	02	30	41	-26.8%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

disease – and vitamin A deficiency, acting alone or together, are probably the second major cause of blindness in developing nations. Conjunctivitis and external ocular infections present frequently in out-patient clinics. It is very important to treat these infections as soon as the diagnosis is made. Laboratory assistance in diagnosis is sometimes required in severe and in epidemic infections.

Diabetic retinopathy: Retinopathy is a major cause of morbidity in patients with diabetes mellitus. The incidence of blindness, for example, is 25 times higher in patients with diabetes than in the general population. Furthermore, diabetic retinopathy is the most common cause of blindness in middle-aged subjects. The vast majority of diabetic patients who develop retinopathy have no symptoms until the very late stages (by which time it may be too late for effective treatment). Chronic hyperglycemia is thought to be the primary cause of diabetic retinopathy.

Source:

Schwab L. Eye care in developing nations. Oxford University Press. 1990

World Health Organization. Magnitude and causes of visual impairment. Fact sheet 282. WHO, 2004.

Freung K. B. Diabetic retinopathy. http://www.vrmny.com/diabetic.htm.

This article is also based on a report prepared by Dr. Nayana de Alwis, Medical Officer, Epidemiological Unit and indoor morbidity data provided by the Medical Statistician, Medical Statistics Unit, Ministry of Health. The WER team also wishes to acknowledge Dr Saliya Pathirana and Dr Mrs. Champa Banagala - Consultant Ophthalmologists of the Eye Hospital, Colombo who provided information on common eye diseases in Sri Lanka.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

18th - 24th June 2005 (25th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	33	629	06	121	00	00	00	27	00	98	03	48	00	03	00	62	**77**
Gampaha	09	355	04	121	00	02	01	26	00	34	02	77	00	00	00	53	**71**
Kalutara	02	102	10	265	00	00	00	25	00	69	02	58	00	00	00	22	**70**
Kandy	02	154	02	237	00	00	06	53	01	08	02	23	00	43	02	39	**68**
Matale	01	13	06	191	00	03	00	17	00	07	01	30	00	00	00	03	**67**
Nuwara Eliya	00	03	06	214	00	00	04	96	00	289	01	06	01	16	00	14	**71**
Galle	00	16	04	64	00	01	00	07	00	02	00	27	00	05	00	06	**63**
Hambantota	00	06	03	91	00	00	01	06	00	30	00	36	02	32	00	09	**60**
Matara	01	32	01	101	00	01	00	18	00	27	00	93	01	63	00	04	**21**
Jaffna	00	06	00	47	00	01	02	211	00	11	00	01	00	78	00	44	**50**
Kilinochchi	00	00	00	04	00	00	00	01	00	02	00	00	00	00	00	03	**50**
Mannar	00	00	00	17	00	00	00	31	00	25	00	00	00	01	00	06	**17**
Vavuniya	00	21	01	56	00	01	01	160	00	04	00	01	00	00	00	04	**50**
Mullaitivu	00	00	00	06	00	00	00	06	00	01	00	00	00	03	00	03	**00**
Batticaloa	00	01	03	18	00	01	00	02	00	02	00	02	00	05	06	160	**71**
Ampara	00	06	00	35	00	00	00	02	00	04	00	07	00	00	00	01	**14**
Trincomalee	00	40	03	192	00	00	00	25	00	26	00	06	00	03	03	105	**56**
Kurunegala	00	52	03	207	00	01	01	34	00	34	00	11	00	07	00	44	**71**
Puttalam	00	75	03	35	00	02	05	99	00	04	00	09	00	00	02	19	**89**
Anuradhapura	00	36	01	71	00	01	00	16	00	26	00	60	00	16	00	32	**42**
Polonnaruwa	00	18	00	23	00	00	00	62	00	01	00	18	00	01	00	16	**86**
Badulla	01	15	17	318	00	00	03	108	00	06	00	47	02	42	04	96	**87**
Monaragala	00	02	01	80	00	00	01	20	00	07	00	80	00	33	00	38	**70**
Ratnapura	03	100	03	325	00	14	00	205	00	15	01	44	02	10	00	20	**53**
Kegalle	01	37	03	231	00	00	01	14	00	09	00	46	00	13	02	46	**70**
Kalmunai	00	04	00	23	00	00	00	08	00	00	00	00	00	00	13	58	**50**
SRI LANKA	**53**	**1723**	**80**	**3093**	**00**	**28**	**26**	**1279**	**01**	**741**	**12**	**730**	**08**	**374**	**32**	**907**	**61**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 02nd July 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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ON STATE SERVICE

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WER SRI LANKA - 2005

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A poliomyelitis outbreak

In 1988, the World Health Assembly (WHA) the annual meeting of the ministers of health of all Member States of the World Health Organization, voted to launch a global goal to eradicate polio. As a result of the Global Polio Eradication Initiative - the largest public health effort to date - at the end of 2003, indigenous polio had been eliminated from all but 6 countries of the world. Global eradication efforts have reduced the number of polio cases from 350,000 annually in 1988, to 1,266 cases in 2004. Six countries remain endemic for polio transmission globally. These are Nigeria, Niger, Egypt, India, Afghanistan and Pakistan, while several other countries have re-established transmission (Mali, Côte d'Ivoire, Burkina Faso and Chad, Central Africa Republic, Sudan and Indonesia).

On 21 April 2005, the National Polio Laboratory in Bandung, Indonesia reported a wild poliovirus isolate, from an acute flaccid paralysis (AFP) case identified by the national surveillance system in Giri Jaya village, Sukabumi District, West Java, Indonesia. The 18-month old child, who was previously un-immunized, had onset of paralysis on 13 March 2005. The Ministry of Health, in collaboration with WHO, sent the poliovirus isolate from this case to WHO's global reference laboratory in Mumbai, India, for genetic sequencing. The global reference laboratory in Mumbai, India, confirmed the wild poliovirus type 1 isolate from the AFP case identified by the national surveillance system in Indonesia. The findings of the investigation suggest recent introduction of wild poliovirus - genetic analysis of the virus demonstrates that its origin is in West Africa. Further analysis suggests the virus travelled to Indonesia through Sudan, and is similar to recently isolated viruses in Saudi Arabia and Yemen.

Soon after the identification of the polio case, a team comprising staff from the Ministry of Health, West Java provincial health authority, Sukabumi district health authority and WHO was in the infected area to conduct an immediate investigation and response. On 26 and 27 April, additional WHO staff from the Regional Office, New Delhi, and from WHO Geneva joined this team to support and guide the investigation and response.

The Ministry of Health, Indonesia, supported by WHO, immediately intensified AFP surveillance in the infected district and surrounding areas and conducted an outbreak response immunization (ORI) in four villages in the immediate area of the case, reaching 4,000 children aged less than five years. The intensified AFP surveillance had detected seven additional AFP cases in the village of the index case. The findings of the investigation demonstrate recent introduction of wild poliovirus. Extensive mop up immunization activities took place targeting 6.4m children less than 5 years in 3 provinces: Banten, DKI Jakarta, and West Java. Coverage data indicates that the first round vaccinated 6.5m children and the second round vaccinated 5.5m. The drop off in children vaccinated may have been due to negative media coverage and to a variety of operational issues.

By July 22 a total of 155 polio cases were con-

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firmed in Indonesia. These new cases are within the areas included during the two emergency vaccination campaigns held on 31 May and 28 June, but with the onset of paralysis between the rounds. Plans are underway for National Immunization Days targeting 24.4 million children less than 5 years old throughout the country on 30 August and 27 September. The costs of the mopping up campaign are as follows: vaccine costs US$1.17 million and operations costs US$1.2 million.

Although immunization campaigns against childhood diseases are success stories across the world, there are instances where it is threatened by certain anti-vaccine campaigns. In the 1970s, concerns that whooping cough vaccine caused neurological damage were surfaced in the UK. In the 1990s, worries that hepatitis B vaccine caused multiple sclerosis mainly played out in France. The suggested link between MMR, autism, and inflammatory bowel disease echoed in the US but remained most potent in the UK. This made parent not to immunize their children with MMR resulting an outbreak of mumps with nearly 5000 cases reporting in January alone. WHO's highly successful global polio eradication programme is the latest victim of localised anti-vaccine activism. The strain of poliovirus causing the new outbreaks originated in Kano province in northern Nigeria. In 2003 Kano was the focal point of a Nigerian Muslim boycott of polio vaccination, after local imams claimed that the vaccine was part of a US plot to spread AIDS or infertility in the Islamic world. Several Nigerian provinces blocked immunisation for months before finally accepting a vaccine manufactured in Indonesia. The boycott was followed by a large outbreak of polio in Nigeria and surrounding countries. Similar rumours were the reason for a drop in the second round coverage during immunization campaign following the current outbreak in Indonesia.

Immunization activities in two countries: Sri Lanka and Indonesia - 2003

	Sri Lanka	Indonesia
Births	312,000	4,515,000
Infant mortality rate (per 1000 live births)	13	31
Gross national income per capita (US$)	930	810
National coverage rates (WHO/UNICEF estimates, 2003)		
BCG (%)	99	82
DPT 3 (%)	99	70
Measles (%)	99	72
OPV 3 (%)	98	70
District coverage (as reported)		
Percentage of districts reporting	100	89
DPT 3 proportion of districts with coverage		
Below 50%	0	3
Between 50-79%	0	14
At 80% or above	100	72
Proportion of districts with no vaccine supply interruption (%)	100	100
Immunization schedule		
OPV	2, 4, 6, 18 months; 5 years	Birth, 1,2,3 months

Indonesia has not had a wild poliovirus case since 1995. The Ministry of Health conducted national immunization campaigns each year from 1995 to 1997, followed by sub-national immunization campaigns in 1999, 2000 and 2001. A further national campaign was implemented in 2002 to maintain high levels of immunity in children. Indonesia's surveillance system for paralysis in children is meeting globally recognized minimum standards, and a review by a team of international experts in June 2003 found that surveillance was adequate to detect wild poliovirus transmission. Despite all these positive correlates of the Indonesian immunization programme, their children contracted wild poliovirus. The main reason was that although the national averages were satisfactory, there were vulnerable pockets where the coverage is considerably lower. The outbreak may continue to spread in the immediate area of the case and outside. Circulation of wild poliovirus could be occurring in other provinces in Indonesia; however this is unknown at the moment.

When polio reached Sudan from Nigeria in the past, it radiated outwards Saudi Arabia, Yemen, Ethiopia and Eritrea and others. An outbreak spreading from Indonesia would be much harder to control than the transmission from Sudan into the Horn of Africa and Yemen, as these routes were often through sparsely populated desert or back into already infected areas. In contrast, there are 200 million people in Indonesia moving all over and trading all over. If the virus does escape Indonesia to neighbouring countries, its containment will vary depending on the polio vaccination coverage those countries already have. China for example, might be able to quash an outbreak within a couple of months. Laos, where coverage is low, for example, would pose more problems.

Although Sri Lanka is free of wild polio virus for last 10 years or more, it is not free from the threat of importation from endemic countries or infection re-established countries. The neighbouring India is also a country where polio is endemic. Although there were no reports that Indian wild polio virus strains are responsible for infection in other countries at least for last two years, the close proximity and increased movements between two countries, cause concern. On the other hand in the current world, the distance does not matter in the spread of infectious diseases. Although, experience in polio eradication demonstrates that outbreaks can be quickly contained with high quality immunization campaigns which reach every child under five years of age, every effort should be made to contain potential threat by importation of wild polio virus.

Identification of any areas with poor vaccine coverage is one of the important activities. This should be done particularly at regional and divisional levels and be corrected if such defi-

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

02nd - 08th July 2005 (27th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	00	00	00	00	00	03	61	60	+01.7%
Diphtheria	00	00	00	00	00	00	00	00	00	00	03	01	+200.0%
Measles	00	00	00	00	00	00	00	00	00	03	36	45	-20.0%
Tetanus	00	00	00	00	00	01 AP=1	00	00	01	00	21	28	-25.0%
Whooping Cough	01 CB=1	00	00	00	00	00	00	00	01	00	50	29	+72.4%
Tuberculosis	224	04	37	11	19	06	00	40	341	137	5129	4327	+18.5%

Table 2: Diseases under Special Surveillance

02nd - 08th July 2005 (27th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	107	07	02	02	01	01	00	13	133	524	1994	8074	-75.3%
Encephalitis	00	00	00	00	00	00	00	00	00	03	34	64	-46.9%
Human Rabies	00	01 KD=1	00	00	00	00	00	00	01	01	32	47	-31.9%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

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ciencies are identified. Basically it is the responsibility of the Medical Officer of Health to identify such pockets in the respective areas and take action. This is very important in areas where the primary health care workers are not working. The Medical Officers of Health should take a personal interest to review the immunization status of those areas. The Deputy Provincial Directors of Health Services should be jeered to fill the relevant vacancies. To identify these vulnerable areas, the Epidemiological Unit is developing a tool by using the existing returns, records and other information in the Ministry of Health. .

Source:

Godlee F. Think mumps. BMJ 2005; 330 (14 May), doi:10.1136/bmj/330.7500.o-f. Available at: http://www,bmj.bmjjournals.com/cgi/content/full/bmj;330/7500/o-f

Global Polio Eradication Initiative. Available at: http://www/polioeradication.org

UNICEF. Immunization Summary 2005. New York, UNICEF; 2005.

World Health Organization. Disease Outbreak News. Available at: http://www.who.int/csr/don/en/index/html.

The Epidemiological Unit requests all health care personnel in both government and private health care facilities to notify all cases with acute flaccid paralysis and fulfil the following surveillance case definition:

Any child under fifteen years of age with acute, flaccid paralysis (including Guillain Barre syndrome) or any person with paralytic illness at any age when poliomyelitis is suspected.

Notification can be made directly to the Epidemiological Unit either by telephone or by fax.

Telephone No : 0112695112
Fax No : 0112696583

Table 3: Selected notifiable diseases reported by Medical Officers of Health

02nd - 08th July 2005 (27th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	68	746	13	138	00	00	00	27	00	98	03	51	00	04	04	66	**77**
Gampaha	35	415	04	135	00	02	00	26	06	40	04	88	01	01	04	60	**79**
Kalutara	04	116	14	289	00	00	01	27	00	73	04	64	00	00	00	23	**70**
Kandy	07	173	07	258	00	00	00	53	00	08	04	29	02	46	02	41	**91**
Matale	00	14	03	204	00	03	00	19	00	07	00	32	00	00	01	06	**75**
Nuwara Eliya	00	03	05	224	00	00	02	103	00	289	00	06	00	16	00	15	**86**
Galle	01	21	05	73	00	01	00	07	00	02	01	29	01	06	00	06	**69**
Hambantota	01	09	10	110	00	00	00	06	00	35	01	37	06	42	00	10	**90**
Matara	00	32	00	104	00	01	00	19	00	27	00	95	00	65	00	04	**29**
Jaffna	00	06	05	57	00	01	02	230	00	11	00	01	01	83	00	44	**63**
Kilinochchi	01	01	01	06	00	00	01	04	00	02	00	00	00	00	00	03	**75**
Mannar	00	00	01	18	00	00	02	33	00	25	00	00	00	01	00	06	**83**
Vavuniya	01	22	02	62	00	02	00	160	00	04	00	01	00	00	00	04	**100**
Mullaitivu	00	00	00	11	00	00	00	08	00	01	00	00	00	03	00	04	**100**
Batticaloa	00	02	00	18	00	01	00	02	00	02	00	02	00	05	02	169	**71**
Ampara	00	07	02	39	00	00	00	02	00	04	00	07	00	00	03	06	**43**
Trincomalee	00	41	03	198	00	00	01	26	00	26	00	06	00	03	02	107	**67**
Kurunegala	01	57	03	221	00	01	02	38	00	34	00	11	00	07	01	45	**94**
Puttalam	00	76	01	38	00	02	02	111	00	04	01	11	00	00	00	21	**78**
Anuradhapura	00	40	01	74	00	01	00	16	01	27	02	63	00	16	00	34	**74**
Polonnaruwa	01	24	00	23	00	00	00	63	00	01	00	18	00	01	00	16	**86**
Badulla	00	15	06	339	00	00	03	127	07	13	00	49	01	44	03	101	**67**
Monaragala	00	02	01	84	00	00	01	21	00	07	01	82	04	40	01	42	**50**
Ratnapura	13	127	07	349	00	15	06	217	00	17	01	48	01	11	01	22	**80**
Kegalle	00	41	11	250	00	01	00	20	02	11	00	50	00	14	02	51	**60**
Kalmunai	00	04	01	24	00	03	00	09	00	00	00	00	00	00	02	73	**40**
SRI LANKA	**133**	**1994**	**106**	**3346**	**00**	**34**	**23**	**1374**	**16**	**768**	**22**	**780**	**17**	**408**	**28**	**979**	**72**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 16th July 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WEEKLY EPIDEMIOLOGICAL REPORT
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WER SRI LANKA - 2005

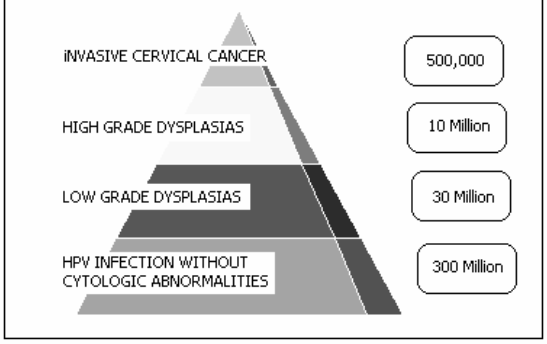
Human papillomavirus

Papillomaviruses are double-stranded DNA viruses that belong to the family Papovaviridae. These viruses are highly species specific; human papillomaviruses (HPV) infect only humans. There are more than 100 types of HPV. They are entirely epitheliotropic, infecting the skin or the anogenital and oropharyngeal mucosa. Specific HPV types tend to infect specific body sites. As an example, HPV types 6 and 11 commonly involve the anogenital area and HPV type 1 the soles of the feet.

HPV infections range from both common and genital warts to invasive carcinoma. Roughly 70% of HPV exposures result in spontaneous clearance without clinical manifestations. The most frequently associated HPV lesions are warts. Sometimes, HPV infections can persist, inducing cytologic abnormalities. These cytologic abnormalities can become progressively worse and result in malignant changes.

Close to 100 HPVs have been completely sequenced and characterized, of which forty are known to primarily infect the genital epithelium. On the basis of extensive molecular epidemiological evidence, these genital HPVs have been sub-divided into low-risk and high-risk types. Low-risk types, such as HPV 6 and 11, are found predominantly in genital warts (condylomata acuminata) occurring on external surfaces of the vulva, anus, and vagina. High-risk, oncogenic types, of which there are at least thirteen (16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68) are more frequently associated with invasive cervical cancer. Of these, HPV type 16 is by far the most common type world-wide.

Figure 1. Estimated Global HPV Burden



The epidemiology of HPV infections remains incompletely understood for several reasons. Most infections are probably subclinical, and even overt sexually transmitted HPV diseases are not routinely reported to public health authorities. Thus, the incidence of infection is not known. It is important to emphasise that in addition to cases of invasive cervical cancer, estimates of the total HPV burden must also include women with high and low grade cervical intraepithelial lesions, as well as those with HPV infections without evidence of cytological abnormalities (Figure 1).

The major manifestations of anogenital HPV include Genital warts (condyloma acuminatum), Bowenoid papules and Bowen's disease, Giant condyloma (Buschke-Loewenstein tumors) and Intraepithelial neoplasia and/or carcinoma of the vulva, cervix, anus or penis.

In addition to cervical cancer, the majority of anal, perianal, vulvar, and penile cancers, and some oropharyngeal cancers appear to be linked to HPV infection. HPV-16 may also be implicated in the development of squamous cell carcinoma of the head and neck.

Close personal contact is assumed to be of im-

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Phases of a clinical trial

Pre-clinical laboratory studies can provide information about pharmacology and toxicology of a newly designed drug. However, clinical trials are the only process by which a researcher can demonstrate that a drug, device, or *biologic* (a vaccine or treatment synthesized from living organisms) is safe and effective, and thus approvable by the authorizing agency.

A clinical trial is a *prospective study* (a study that is planned in advance in which data are then collected in the future, as opposed to using data that has already been collected), and so it permits manipulation and measurement of a treatment in a controlled setting and thus provides the optimal strategy to avoid errors. If done properly, therefore, it is highly likely that the results will be considered valid. Disadvantages of clinical trials, beyond their infeasibility in some situations due to ethical concerns, include their costly and time-consuming nature. From the synthesis of a new drug to its appearance on the market can take approximately seventeen to twenty years, and cost from 0.8 to 1.7 billion dollars.

After an experimental drug has been shown to be promising in laboratory and animal studies, experimentation in human subjects begins. This is a four-phase series of clinical trials progressively examines the optimal dose, safety, short-term and long-term effects on the body, and ultimately the effectiveness of an experimental therapy in humans.

Phase I trials assess the tolerance of a drug. Often performed on a small sample group of healthy people, these trials aim to find the Maximum Tolerated Dose (MTD) of a drug and assess its toxicity. The therapeutic effectiveness of the drug or vaccine is less of interest than the *pharmacodynamics* (the effect of the product on the body, e.g. heart rate and respiration), as well as the *pharmacokinetics* (the effect of the body on the product including how it is absorbed, distributed, metabolized, and eliminated). Only one in 10,000 pharmacological compounds reach this phase, and of those only eight percent will eventually make it to the drug market.

Phase II trials are performed on a small number of people with the disease in order to find the optimal dose of the drug. As in Phase I trials, testing the efficacy of the drug is a secondary concern, although the short-term therapeutic activity may be assessed. These trials frequently employ *surrogate endpoints*, substitute variables that are used when a clinical endpoint is not convenient or feasible. For example, in hypertension studies, mortality is the most important endpoint, but raised blood pressure is often the endpoint that is measured.

Phase III trials are performed on a large number of people who are randomly assigned to a treatment group or a *control group* (which receives either a *placebo* an inactive treatment or an active control such as an existing *standard of care* (SOC) drug). Phase III trials often use the population for which the drug is intended, so the subjects may be more heterogeneous than in a Phase II trial. Finally, Phase III trials may be *blinded* so that neither the subject nor the treatment provider knows whether the subject has been assigned to the treatment group or the control group as an additional way to eliminate potential errors.

Phase IV trials are conducted after the drug has been approved, and are intended to investigate the drug's long-term effects by following up with the subjects over a long period of time. These trials may observe the effects of the drug in the settings where it is used in practice, may act as surveillance of safety, and/or may be used as a marketing tool to expand the use of the drug to new populations.

(Continued from page 1)

portance for the transmission of cutaneous warts. Genital HPV infections are considered to be spread by sexual intercourse and close physical contact involving an infected area. HPV is the most common sexually acquired infection in certain countries including United States.

No antiviral drugs are currently licensed for the treatment of infections caused by HPV. Different types of warts and warts at different anatomic sites may require different approaches to treatment. At present, no effective method of prevention is available for warts other than avoiding contact with infectious lesions. It seems that condoms are not helpful in preventing the transmission of genital HPV infection as it appears that transmission can occur manually during foreplay, during nonvaginal sex, and from the scrotum to vulva (and then to the vagina and cervix) on the outside of the condom.

Once infection of the female genital tract has occurred, the Papanicolaou (PAP) smear is an essential screening tool for the prevention of cervical cancer.

Numerous international epidemiological and molecular studies have confirmed HPV as the aetiologic agents responsible for the development of cervical neoplasia. This significant development in the understanding of cancer biology paved the way for the subsequent development of a vaccine against cervical cancer. There is sufficient evidence to indicate that a cancer of infectious origin can be prevented by immunization, the declining incidence of hepatocellular carcinoma following the introduction of hepatitis B vaccine provides excellent proof of this possibility.

To date, HPV vaccine development has progressed along two lines. Prophylactic vaccines to prevent de novo HPV infections and therapeutic vaccines to induce viral clearance and regression of existing pre-cancerous lesions have been explored.

The results of phase I and II trials undertaken, to date, and utilising different HPV types, demonstrate that these prophylactic vaccines are highly efficacious against persistent HPV infection. They are able to reduce the incidence of type-specific associated cervical abnormalities; are well tolerated by subjects; and can elicit significant humoral antibody responses and robust cell mediated immune responses at levels higher than those observed in natural infections. Systemic immunization with a sub -unit VLP HPV vaccine, even without adjuvant, can induce protective immunity against a sexually transmitted mucosal viral infection.

HPV vaccines are currently undergoing international Phase III trials. The bivalent HPN 16-18 VLP vaccine is being tested in 90 centres

(Continued on page 3)

Genital Warts in Sri Lanka

In 2004, a total of 779 new cases with genital warts were reported in 20 clinic centers conducted by the National STD/AIDS Control Programme. This accounted for 7.9 percent of total venereal cases reported. The majority (66%) was in 20- 29 age group. There is a large sex variation among reported as 68% were males.

Table 1: Vaccine-preventable diseases & AFP

09th - 15th July 2005 (28th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	01 KD=1	00	00	01 Kr=1	00	00	00	02	03	63	63	00.0%
Diphtheria	00	00	00	00	00	00	00	00	00	00	03	01	+200.0%
Measles	00	00	00	00	00	00	00	00	00	00	36	47	-23.4%
Tetanus	00	00	00	00	00	00	00	00	00	00	21	27	-22.2%
Whooping Cough	01 KL=1	00	00	00	00	00	00	03 KG=3	04	00	55	30	+83.3%
Tuberculosis	265	81	11	23	24	03	24	13	444	262	5573	4589	+21.5%

Table 2: Diseases under Special Surveillance

09th - 15th July 2005 (28th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	52	09	04	02	04	03	00	10	84	569	2084	9062	-77.0%
Encephalitis	00	00	00	00	00	00	00	00	00	00	33	64	-48.4%
Human Rabies	00	00	00	01 TR=1	00	00	00	00	01	03	33	50	-34.0%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

across 14 countries, among 123,000 women, aged 15-25 years. Prevention of CIN (cervical intraepithelial neoplasia) 1 and 2 as well as of persistent HPV infection will be the end points to be evaluated. The quadrivalent HPV16, 18, 11, 6 vaccine is also being tested in 25,000 subjects in an international Phase III trial.

Despite the tremendous progress achieved to date in the development of cervical cancer preventing HPV vaccines, a number of outstanding issues remain to be addressed. One issue is the unknown duration of immunity induced by these L1-VLP vaccines. Preliminary data from several Phase II trials have indicated that antibody titres fall from peak levels achieved after immunization to low but measurable levels persist for at least 36 months post-vaccination. Since the window of observation of subjects in these vaccine trials has been relatively short, the duration of L1-VLP vaccine-induced protection and whether boosting mayor may not be required remains to be determined.

Source:

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Table 3: Selected notifiable diseases reported by Medical Officers of Health

09th - 15th June 2005 (28th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	24	771	06	144	00	00	00	27	00	98	00	52	00	04	01	67	**54**
Gampaha	19	437	05	140	00	02	01	27	00	40	02	90	00	01	00	60	**50**
Kalutara	09	125	07	299	00	00	00	27	00	73	00	65	00	00	00	23	**80**
Kandy	07	180	12	270	00	00	03	56	00	08	01	30	02	48	00	41	**68**
Matale	02	16	05	212	00	02	00	19	00	08	00	32	00	00	00	06	**67**
Nuwara Eliya	00	03	07	231	00	00	06	109	00	289	01	07	02	18	00	15	**86**
Galle	02	23	02	75	00	01	00	07	00	02	00	29	00	06	00	06	**63**
Hambantota	01	10	04	114	00	00	00	06	00	35	00	37	03	45	00	10	**60**
Matara	01	33	02	106	00	01	00	19	00	27	00	95	02	67	00	04	**29**
Jaffna	00	06	02	59	00	01	01	231	00	11	00	01	00	83	00	44	**50**
Kilinochchi	00	01	02	08	00	00	01	05	24	26	00	00	00	00	00	03	**50**
Mannar	00	00	00	18	00	00	00	33	00	25	00	00	00	01	00	06	**17**
Vavuniya	00	22	00	62	00	02	01	161	00	04	00	01	00	00	00	04	**100**
Mullaitivu	00	00	00	11	00	00	00	08	00	01	00	00	00	03	00	04	**100**
Batticaloa	00	02	00	18	00	01	00	02	00	02	00	02	00	05	04	173	**71**
Ampara	00	08	00	41	00	00	01	03	00	04	00	07	00	00	01	07	**29**
Trincomalee	02	43	02	200	00	00	00	26	00	26	00	06	00	03	06	113	**67**
Kurunegala	00	57	07	228	00	01	01	39	00	34	00	11	01	08	00	45	**71**
Puttalam	04	81	00	38	00	02	00	111	00	04	00	11	00	00	00	21	**56**
Anuradhapura	01	41	01	77	00	01	01	17	00	27	00	63	00	16	00	34	**47**
Polonnaruwa	02	26	01	24	00	00	00	63	00	01	00	19	00	01	00	16	**86**
Badulla	00	15	12	360	00	00	03	131	00	13	00	49	02	46	02	103	**60**
Monaragala	00	02	02	89	00	00	00	21	00	07	00	82	01	41	01	44	**40**
Ratnapura	07	134	34	388	00	15	06	225	00	17	00	48	00	11	02	24	**80**
Kegalle	03	44	03	255	00	01	00	20	00	11	04	56	00	15	00	52	**70**
Kalmunai	00	04	00	24	00	03	00	09	00	00	00	00	00	00	02	75	**40**
SRI LANKA	**84**	**2084**	**116**	**3491**	**00**	**33**	**25**	**1402**	**24**	**793**	**08**	**793**	**13**	**422**	**19**	**1000**	**59**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 23rd July 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WER SRI LANKA - 2005

Changing epidemiological pattern of malaria in Sri Lanka

Historical overview

Historical records indicate that malaria has affected the inhabitants of the island for many centuries. However the exact period of its introduction to Sri Lanka cannot be determined with certainty. Historians believe that the devastation caused by malaria brought down the great ancient civilization from beginning of the 13th century. Over the years, successive rulers have followed the pattern of malaria as it has affected the aspects such as economy of the country, productivity of the labour force etc in many ways. Dutch colonial rulers in 1638 for the first time started highlighting risk areas of malaria on a map by denoting North Central area as "Fever ridden "and the old Yala kingdom as an area depopulated by "Fever sickness ".The logical public health outcome of the interest in impact of malaria was the organized state intervention towards prevention and control of malaria. Thus, malaria is written in the annals of history as one of the earliest public health problem for which organized public health activities were designed.

Epidemiology of malaria in Sri Lanka

Though both species of malaria parasites (*Pl .vivax*, *Pl. falciparum*) are encountered, the predominant species in Sri Lanka is the *Plasmodium vivax*. *Anopheles culicifacies* has been reported to be largely responsible for transmitting malaria in Sri Lanka although other anophelenes (*Anopheles subpictus*, *Anopheles annularis)* have been implicated as potential vectors.

In general the degree of endemicity of malaria in different parts of the country has been largely determined by climatic factors which in turn influence the vector breeding potential in an area. Depending on the average annual rainfall, three climatic zones are recognized. In the "dry zone" where the average annual rainfall is less than 2000 mm, the transmission of malaria is increased following monsoonal rains. Malaria remains endemic throughout the region. In the "wet zone " which experiences an annual rainfall exceeding 2000 mm , malaria is focal and sporadic. The "intermediate zone "experiences the unstable type of malaria with increased transmission during dry weather when pooling is seen on river beds and streams. Malaria transmission in Sri Lanka characterizes seasonality. Two transmission peaks are often seen. The major peak follows North East monsoon (Dec-Jan) while the minor peak follows South West monsoon (June-July).

Changing epidemiological pattern

Morbidity related to malaria

Incidence of malaria had been gradually rising since 1995. The observed trends were mainly due to the enhanced malaria transmission in the North Eastern Province (NEP) in Sri Lanka. The gravity of the problem in uncleared areas is reflected in the report of the study done by the Medicines Sans Frontiers (MSF) and the Mallavi desk of AMC which reported that less than 3% of population in uncleared areas had 36% of malaria in 2000. Among the factors which had

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effects on the changing disease frequency in the NEP, it is assumed that the constraints experienced by the Anti malaria Campaign (AMC) in implementing the field based malaria control activities due to the conflict were mainly responsible for the paradigm shift.

The distribution of malaria cases by districts too has been drastically changed over the last decade. The role of the North Western and North Central Provinces in terms of contributing the bulk of the total case load in the early 1990s has been shifted to previously low key NEP by the latter part of the 1990s. In 1999, 50% of the total reported malaria cases were from Jaffna, Mullaitivu, Kilinochchi and Vavuniya in the NEP. The contribution of the two districts in the North Western Province which contributed about 40 % of reported malaria cases in 1990 had declined to 6% by 1999.

With the dawn of the new millennium, incidence of malaria is observed to have acquired a declining trend. In 2001, there had been a 68% reduction in the number of confirmed malaria cases in comparison to the figures of the previous year. This reduction was further confirmed by the decrease in Annual Parasite Incidence (API) from 11.2 to 3.5 and Slide Positivity Rate (SPR) from 11.8 to 4.9. This reduction of malaria incidence has been made possible by the reduction of infection by 50% in the two uncleared districts namely Mullaitivu and Kilinochchi. The progress was sustained in following years by achieving a reduction by 38% and 75% respectively in 2002 and 2003 in the NEP. The year 2002 recorded the lowest number of confirmed malaria patients for the span of 20 years since 1982. It is assumed that the opportunities and avenues that were open following the ceasefire agreement between government and the warring faction, to implement effective malaria control activities in the so called "uncleared areas" by the field staff in malaria control provided the platform for the achieved progress.

Objectives of Anti Malaria Campaign in Sri Lanka

1. To reduce the National Annual Parasite Incidence by the year 2009 , to a level 50% below that in 2003 (0.9)
2. To eliminate deaths from malaria by the year 2009
3. To reduce morbidity due to Plasmodium falciparum infections to a level 50% below that in 2003 (1273 cases) by the year 2009
4. To reduce malaria in children below 5 years to a level 50% below that in 2003 (approximately 1750) by the year 2009
5. To eliminate malaria among pregnant women by the year 2009

Though the falciparum infections were showing a declining trend in the country, a paradoxical trend had been observed in the NEP. At the national level, percentage of falciparum had declined from 28% in year 2000 to 12% in 2002. But in the NEP, the proportion of falciparum infections had demonstrated an upward trend. The highest number of falciparum infections had been reported in the war stricken district of Kilinochchi in 2000. Cases reported in Mullaitivu and Kilinochchi comprised 52 % of total falciparum malaria in 1999. Constraints associated with implementing field based malaria control activities had been cited as a reason for high falciparum infections in this area.

Additionally, the large numbers of displaced and mobile populations vulnerable to malaria infections, emergence and spread of chloroquine resistance in falciparum malaria, emergence of Malathion resistant vectors would have been the other factors contributed to the increase in falciparum infections.

Mortality related to malaria

Due to early detection of malaria infections and administration of correct treatment, mortality due to malaria is low in Sri Lanka in comparison to what is experienced in other South East Asian countries. Most of the malaria related deaths being reported from the NEP is suggestive of the impact of late diagnosis and late treatment in an environment where the basic health infrastructure has been disrupted due to the conflict. A study done by the MSF and the local desk of AMC revealed that there was a treatment delay, a notable degree of self medication with Paracetamol and non adherence to treatment. Long waiting time for treatment due to increased service demand of the huge displaced population and acute shortage of the staff led to self medication and treatment delay.

Of all malarial deaths, 62% of deaths had occurred in uncleared areas in the North in 1999. The next highest reported mortality figures were also from the adjacent Anuradhapura district which was also partially affected by the conflict in the NEP. Most of the death had occurred in the age groups less than 10 years and above 45 years. The majority of malaria related deaths were due to *P. falciparum* infection and had been confirmed microscopically. Only in a handful of deaths, post mortem had confirmed the cause as malaria. However, the poor coverage and incompleteness of notification have to be borne in mind in interpretation of these mortality figures.

Thus, it is evident that the epidemiological pattern of malaria has changed drastically in the recent past. Accordingly the AMC has set objectives for malaria control (refer to Box). It is imperative that these objectives are attained by the judicious use of available malaria control methods. In addition to

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

16th - 22nd June 2005 (29th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	01 TR=1	00	00	00	00	01	02	64	65	+01.5%
Diphtheria	00	00	00	00	00	00	00	00	00	00	03	01	+200.0%
Measles	00	00	00	00	00	00	00	00	00	02	36	49	-26.5%
Tetanus	00	00	00	00	00	00	00	00	00	00	21	27	-22.2%
Whooping Cough	02 CB=1KL=1	00	00	00	00	00	00	02 KG=2	04	00	59	30	+96.7%
Tuberculosis	20	08	17	22	17	00	06	06	96	244	5669	4833	+17.3%

Table 2: Diseases under Special Surveillance

16th - 22nd June 2005 (29th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	87	14	05	00	03	05	01	18	133	651	2293	10099	-77.3%
Encephalitis	00	00	00	00	00	00	00	00	00	00	33	66	-50.0%
Human Rabies	00	00	00	00	00	00	00	00	00	02	33	52	-36.5%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

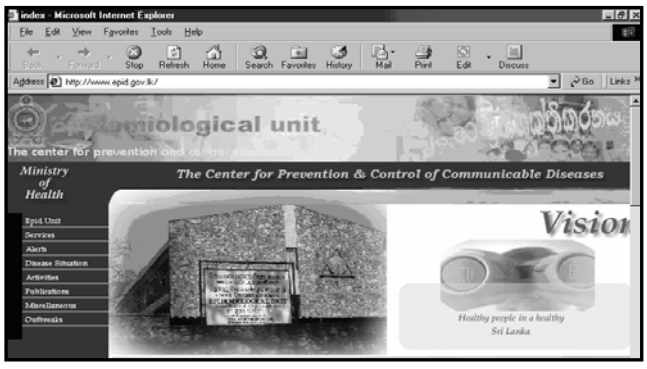
Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

the efforts of the AMC, positive factors such as increased reliance of the individuals on self protection methods and the favourable field conditions emanating from the relative peace prevailing in the NEP could be of immense use to attain these objectives.

The WER team wishes to acknowledge Dr. Gawrie Galappaththi, Consultant Community Physician, Anti-Malaria Campaign and Dr. Ranjan Wijesinghe for providing data and compiling this article.



The new web site of the Epidemiological Unit is launched recently. It can be accessed at:

http://www.epid.gov.lk

Table 3: Selected notifiable diseases reported by Medical Officers of Health

16th - 22nd June 2005 (29th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	48	875	03	148	00	00	00	29	00	98	02	55	00	04	01	70	**62**
Gampaha	32	480	03	145	00	02	00	27	00	40	00	90	00	01	00	61	**64**
Kalutara	07	133	10	309	00	00	01	28	04	77	00	66	00	00	02	25	**90**
Kandy	10	192	08	281	00	00	03	59	00	09	00	30	03	51	02	44	**86**
Matale	00	16	04	218	00	02	00	19	00	08	00	32	00	00	00	06	**67**
Nuwara Eliya	04	07	03	234	00	00	04	113	00	289	00	07	00	18	01	16	**100**
Galle	01	24	02	77	00	01	00	07	00	02	00	31	00	06	01	07	**50**
Hambantota	02	13	04	124	00	00	00	06	00	35	00	37	04	50	00	10	**90**
Matara	02	37	00	108	00	01	00	19	00	27	00	96	03	73	00	04	**43**
Jaffna	00	06	03	67	00	01	05	245	00	12	00	01	00	83	03	47	**88**
Kilinochchi	00	01	07	15	00	00	00	05	00	26	00	00	00	00	00	03	**75**
Mannar	00	00	01	20	00	00	01	34	00	25	00	00	00	01	00	08	**83**
Vavuniya	00	22	03	65	00	02	00	161	00	04	00	01	00	00	00	04	**100**
Mullaitivu	00	00	01	12	00	00	02	10	01	02	00	00	00	03	00	04	**100**
Batticaloa	00	02	00	18	00	01	00	02	00	02	00	02	00	05	00	180	**71**
Ampara	00	08	00	41	00	00	01	04	00	04	00	07	00	00	01	08	**29**
Trincomalee	00	43	03	204	00	00	01	27	00	26	00	06	00	03	03	116	**44**
Kurunegala	01	58	15	246	00	01	04	43	00	34	00	11	00	08	01	46	**76**
Puttalam	02	83	01	39	00	02	04	116	00	04	00	11	00	00	01	22	**78**
Anuradhapura	02	43	03	85	00	01	00	17	00	27	03	67	00	16	00	34	**79**
Polonnaruwa	03	29	00	24	00	00	02	67	00	01	00	19	00	01	00	16	**100**
Badulla	01	16	06	369	00	00	06	139	00	13	00	49	02	49	01	109	**87**
Monaragala	00	02	02	91	00	00	01	23	00	07	00	83	03	46	01	45	**80**
Ratnapura	11	145	13	403	00	15	05	230	00	17	03	51	00	11	01	25	**87**
Kegalle	07	54	02	259	00	01	00	20	00	11	01	58	00	15	02	55	**70**
Kalmunai	00	04	02	28	00	03	01	10	00	01	00	00	00	01	07	95	**70**
SRI LANKA	**133**	**2293**	**99**	**3630**	**00**	**33**	**41**	**1460**	**05**	**801**	**09**	**810**	**15**	**445**	**28**	**1060**	**74**

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 23rd July 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WER SRI LANKA - 2005

Vol. 32 No. 31 **30th July - 05th August 2005**

National malarial drug policy

Elimination of *Plasmodium falciparum* infections, prevention of the spread of chloroquine resistant falciparum infections, and prevention of deaths due to malaria have been identified as priorities of the Anti Malaria Campaign (AMC) in Sri Lanka. Accordingly, early detection and prompt treatment of malaria patients and asymptomatic carriers have been identified as essential and significant strategies to address these priorities.

Drugs which act selectively on different stages of the life cycle of malaria parasite are used to treat malaria. The objectives of the National Anti Malarial Drug Policy are manifold. Among them, reduction and elimination of parasites provide relief to the patient. Cessation of further multiplication of the parasite prevents complications and deaths due to malaria. Prompt treatment ensures the prevention of recrudescence and relapses of the infection. Correct treatment minimizes the chances of emergence of drug resistant malaria. From the public health point of view, chemotherapy prevents the transmission of malaria.

Treatment of *P. vivax* infections

Treatment of *vivax* infections is aimed towards ensuring the clinical relief, clearance of parasitaemia and the destruction of liver hypnozoites. By clearing the parasitaemia, radical cure is achieved as well as complications and transmission are prevented. Occurrence of relapses is halted by destroying liver hypnozoites. Chloroquine given for 3 days destroys erythrocytic forms while primaquine administered for 14 days eradicates hepatic forms (refer the box-1 for dosages)

Treatment of *P. falciparum* infections

Treatment of falciparum infections provides clinical relief to the patient and clears malaria parasites in the blood. The clearance of parasites from the blood helps ensuring radical cure, prevention of complications and transmission of the infection. The first line of treatment for falciparum infections comprises chloroquine and primaquine. Chloroquine acts on asexual forms of the parasite while primaquine encounters sexual forms. Chloroquine is given for three days while primaquine is a single dose (refer Box I for dosages).

However, treatment failure of the first line drugs have been observed. With the first dose of chloroquine, patient feels a huge clinical relief and tends to discontinue the drug rather than taking the full course. Theses are the main issues that have affected the sensitivity of chloroquine and the emergence of falciparum drug resistance in Sri Lanka.

Chloroquine resistant strains of *P. falciparum* have become increasingly recognized in the island since 1984. Estimates of the extent of chloroquine resistance among *P. falciparum* infections in Sri Lanka for which second line treatment is used are in the range of 15-55%.

Microscopically confirmed falciparum patients whose repeat blood smears on the 8th day or at any time after 8th day and before the 28th day of treatment reveal asexual parasite stages (Trophozoites /Ring stages) are considered as chloroquine resistant falciparum malaria. Additionally any person who acquires a falciparum infection while on chloroquine weekly prophy-

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laxis is resistant to chloroquine.

Drug sensitivity trials both *in vivo* and *in vitro* carried out by the AMC in endemic regions during 1992-2003 demonstrate that the majority of resistant patients are in the category of **R-I.** The number of patients belonging to **R-II** is low. **R-III** category was lower than the former two categories. The second line treatment for such infections is the combination of sulphadoxine & pyrimethamine **(S+P).** The use of this drug was restricted till 1992. However, in 2000 and 2001, a few foci of chloroquine resistant *P. falciparum* were controlled by use of the second line treatment.

Box I – Treatment schedule of malaria

Age group	Chloroquine			Primaquine	
	P. vivax or P. falciparum infection			*P. vivax infection*	*P. falciparum infection*
	1st day	2nd day	3rd day	(For 14 days)	(Single dose)
< 1 year	1/2	1/2	1/4	Not given	Not given
1-5 years	1	1	1/2	½ tablet	1½ tablets
6-10 years	2	2	1	1 tablet	3 tablets
11-15 years	3	3	1 1/2	1½ tablets	4 ½ tablets
> 15 years	4	4	2	2 tablets	6 tablets

One Chloroquine tablet is equivalent to 150 mg of base
One Primaquine tablet is equivalent to 7.5 mg of base

Treatment schedule of S+P is given in the Box-II. With S+P, primaquine is administered only if it has not been administered to the patient during the preceding 7 days. S+P is not indicated during the last trimester of pregnancy and the first two months of infancy. Any person who is allergic to sulpha drugs are not given S+P. Such patients may be treated with oral quinine {adult- 2 tablets (300 mg base each), children-10 mg of the salt per Kg body weight thrice a day for 7-10 days} or parenteral quinine. Parenteral quinine is administered in a dose of 10 mg per Kg body weight thrice a day until such time the patient can take quinine orally. Thereafter the balance of quinine is administered orally. Parenteral quinine should be administered in the form of an infusion preferably diluted in 10% Dextrose over a period of 4 hours. When quinine is administered parenterally, regularly blood glucose levels should be monitored due to the risk of hypoglycaemia.

Box II Treatment schedule for S+P drugs

Age group	S+P	Primaquine
	Single dose	*Single dose*
0-2 months	Not given	Not given
3-12 months	¼ to ½ tab	Not given
1-5 year	¾ tab	1 ½ tab
6-10 years	1 ½ tab	3 tab
11-15 years	2 ¼ tab	4 ½ tab
> 15 years	3 tab	6 tab

Against this background , in 1994, the AMC confronted with another issue related to chemotherapy of malaria. In 1994, the country experienced the first reported case of S+P resistant *P. falciparum*. This heralded the coming of age of Multi Drug Resistant (MDR) malaria as it has been in other South East Asian countries. This magnified the need for a suitable drug policy incorporating MDR falciparum infections. The issue invites the efforts for enhanced vigilance through follow up or by active case detection and treatment in order to curtail the spread of MDR strains. In view of this, in 1999, a hospital based prospective study was done to assess the efficacy, safety and tolerance of the combination drug therapy (Artesunate, S+P, and Primaquine) for falciparum infections in Moneragala district. It was revealed that this combination was effective for the treatment of *P. falciparum* malaria, safe for the patient and well tolerated by the patient.

Chemoprophylaxis

No drug which acts against the parasite that is introduced to man during the bite of an infective mosquito (sporozoite) has still been discovered. Thus, the chemoprophylaxis do not cause true prophylaxis but only cause suppression of the clinical illness. However, in the case of falciparum infection, no dormant parasitic stages (hypnozoite) are formed in the liver. Therefore, if a person on chemoprophylaxis is infected with *P. falciparum*, a radical cure will also be effected if the drug has been administered for prophylaxis in the appropriate manner. But if the person contracts vivax malaria, the hypnozoites in the liver can give rise to a clinical attack of malaria once the prophylaxis is discontinued. The drug recommended for this purpose by the AMC is chloroquine which should be taken weekly throughout the period of exposure. The dosage varies across different age groups.

All persons taking chemoprophylaxis during their temporary stay in malarial areas and subsequently returning to their usual residence in non malarial areas should ensure that weekly chemoprophylaxis is continued for a period of four weeks after leaving the malaria endemic area. It is also important that all such persons commence taking chemoprophylaxis preferably one week prior to entering the malaria endemic areas when the date is known to them. Persons who leave at short notice and are unable to commence Chemoprophylaxis one week before are advised to start at the earliest possible opportunity. Those who are traveling abroad are advised to consult the AMC regarding relevant chemoprophylaxis.

Chemoprophylaxis is recommended for following groups :

- **Pregnant women in malaria endemic areas-** Since pregnancy causes temporary immune-depression , there can be severe manifestation of malaria with devastating consequences for both mother and the fetus. Therefore, Chemoprophylaxis should be commenced as soon as the pregnancy is known. Chloroquine is not contra indicated during any stage of pregnancy. Pregnant women in malaria endemic areas should continue chemoprophylaxis for a period of six weeks after delivery if they breast feed their infants, to prevent the possibility of the infants having malaria, during the

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

23rd - 29th July 2005 (30th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	01 NE=1	00	00	00	00	00	01 KG=1	02	01	66	66	00.0%
Diphtheria	03 GM=2KL=1	00	00	00	00	00	00	00	03	00	06	01	+500.0%
Measles	00	00	00	00	00	00	00	00	00	03	35	52	-32.7%
Tetanus	00	00	00	00	00	00	00	00	00	00	21	27	-22.2%
Whooping Cough	04 CB=2KL=2	00	00	00	00	00	00	00	04	03	64	34	+88.2%
Tuberculosis	133	06	11	12	19	07	00	11	199	160	5868	4993	+17.5%

Table 2: Diseases under Special Surveillance

23rd - 29th July 2005 (30th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	88	08	09	03	06	01	00	19	134	516	2454	10780	-77.2%
Encephalitis	00	00	01 GL=1	00	01 KR=1	00	00	00	02	04	35	70	-50.0%
Human Rabies	00	00	00	00	00	00	00	00	00	01	33	53	-37.7%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

first six week of the puerperium .

- **Foreigners** –Especially those who are coming from non-malarial areas are advised to commence chemoprophylaxis as they are non immune. One problem associated with foreigners is that they bring drugs other than chloroquine. This is not justified considering the emerging drug resistance in Sri Lanka. However, proguanil daily can be advised in addition to the weekly dose of chloroquine.

The following individuals are advised to take prophylaxis at least during a period of six month of their arrival in the new settlements

- **Non immune local residents traveling to malaria endemic areas on temporary basis.**
- **Refugees and security personnel deployed in malaria endemic areas.**
- **Any other person who have to live temporary in location in a high intensity of malaria transmission while enjoying their occupational activities**.
- **Any other person who is traveling abroad (to a malaria endemic area).**

The Editor wishes to thank Dr Gowrie Galappaththi, Consultant Community Physician, Anti Malaria Campaign and Dr Ranjan Wijesinghe for their support in compiling this article.

Errata:

The time periods for the following tables should read as mentioned below:

*Vol. 32 No 29. Table 3: 09th - 15th **July** 2005 (28th week)*

*Vol. 32 No. 30. Table 1, 2, and 3: 16th - 22nd **July** 2005 (29th week)*

Table 3: Selected notifiable diseases reported by Medical Officers of Health

23rd – 29th July 2005 (30th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	58	950	05	157	00	00	03	32	00	98	01	59	00	04	06	76	69
Gampaha	25	506	02	148	00	02	01	29	02	42	02	92	00	01	04	65	57
Kalutara	05	138	06	316	00	00	01	29	00	77	01	67	00	00	00	25	80
Kandy	08	200	04	286	00	00	06	65	00	09	01	31	00	51	04	48	82
Matale	00	16	02	221	00	02	00	19	00	08	00	33	00	00	00	06	75
Nuwara Eliya	00	07	01	235	00	00	15	128	01	290	00	07	01	19	00	16	100
Galle	03	28	02	80	01	02	00	08	00	02	03	35	01	07	00	08	63
Hambantota	02	15	16	151	00	00	00	06	00	35	00	37	04	55	01	11	90
Matara	04	42	00	108	00	01	00	19	00	27	00	96	00	75	00	04	07
Jaffna	01	07	08	75	00	01	15	260	01	13	00	01	00	83	01	48	88
Kilinochchi	00	01	00	15	00	00	00	05	00	26	00	00	00	00	01	04	50
Mannar	00	00	00	20	00	00	00	34	00	25	00	00	00	01	00	08	17
Vavuniya	01	23	05	70	00	02	03	164	01	05	00	01	00	00	00	04	100
Mullaitivu	00	00	01	13	00	00	00	10	00	02	00	00	00	03	00	04	100
Batticaloa	01	03	03	24	00	01	01	03	00	02	00	02	00	05	13	202	78
Ampara	00	08	00	41	00	00	00	04	00	04	00	07	00	00	00	08	14
Trincomalee	00	43	04	212	00	00	00	27	00	26	00	06	00	03	01	117	67
Kurunegala	04	62	02	248	01	02	00	43	00	34	02	13	00	08	01	47	65
Puttalam	02	87	00	39	00	02	00	118	00	04	01	12	00	00	02	24	78
Anuradhapura	01	46	03	92	00	01	00	17	00	27	00	67	00	16	01	36	84
Polonnaruwa	00	29	01	25	00	00	00	67	00	01	00	19	00	01	00	16	57
Badulla	00	16	06	375	00	00	16	155	00	13	03	52	04	53	08	117	80
Monaragala	00	02	02	94	00	00	00	24	00	07	00	83	01	48	02	47	70
Ratnapura	17	165	12	416	00	15	01	231	00	17	00	51	00	11	00	25	67
Kegalle	02	56	03	262	00	01	01	22	00	11	06	67	02	17	06	61	70
Kalmunai	00	04	00	28	00	03	00	10	00	01	00	00	00	01	08	103	64
SRI LANKA	134	2454	88	3751	02	35	63	1529	05	806	20	838	13	462	59	1130	68

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 06th August 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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Vol. 32 No. 33 13th - 19th August 2005

SRI LANKA - 2005
WEER

Public health laboratory in disease surveillance

Health surveillance activities are considered very dynamic and ever evolving deleting or incorporating diseases or health events according to their public health importance and burden, availability of cost-effective interventions and resources. To maintain its functional relevance, it should be able to appreciate changes in the epidemiological pattern of disease and health conditions in time and space with particular reference to new, emerging and re-emerging pathogens and public health problems.

Epidemics and newly-emerging infections are threatening the health of people globally and impacting on travel and trade in the increasingly interconnected world. Many epidemic threats, such as cholera, meningitis, yellow fever and dengue, recurrently challenge health systems in countries with very limited resources. Others, such as influenza and severe acute respiratory syndrome (SARS), have demonstrated their potential to create new pandemics. Natural disasters may result in epidemics in affected populations and the risk of accidental or intentional release of biological agents is an additional threat to global health security. Epidemics, recurrent or unanticipated, add to the heavy burden borne by health services struggling to cope with the major diseases of poverty such as AIDS, tuberculosis and malaria, and the growing impact of non-communicable diseases.

Such diseases know no frontiers. Because of the mobility of people and goods, a communicable disease occurring in one country can, the next day, find itself transmitted to another anywhere in the world. It is therefore vital that the available information on any new epidemic rapidly be communicated to scientists and public health officials throughout the world. In addition there is the threat of spreading these infections within a country across larger geographical boundaries. Effective national surveillance systems are essential to prevent this local and international spread of epidemic diseases. Within these systems, public health laboratories play a critical role. For more than 50 years, scientific and technological advances have created tremendous opportunities for progress in combating infectious diseases. However, experts are in view that in some countries, the laboratory support for effective surveillance is grossly lacking, particularly at the district and peripheral levels. The concept of laboratory-based surveillance is poorly appreciated in general. Although several very good laboratories are available in the South East Asia Region, their expertise was not appropriately harnessed during public health emergencies experienced because of poor networking.

The latest technological advances are not required in every centre, but every country needs the capacity to identify and respond rapidly to epidemic threats. The appropriate response to epidemics depends on precise identification of the pathogenic agent(s) involved. Thus national public health laboratories (or other laboratory services with public health responsibilities at country level) have a crucial role to play in the rapid provision of accurate information on the causes of epidemics, the most effective course of

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NAMRU-2 training on outbreak investigation and response

During the recent past Sri Lanka experienced several disease outbreaks of infectious origin. In some of those outbreaks, the causative agents or organisms were unknown at the beginning. There were a big role to play by laboratories in establishing the diagnosis and control of these outbreaks. However, in Sri Lanka the involvement of laboratories in outbreak investigations was not up to the expectation. These recent outbreaks shed the light on this underutilized aspect and constraints experience in a crisis. In this context the recently concluded international training programme on outbreak investigation and response was a timely activity. This was a collaborative exercise of the Epidemiological Unit with the United State Naval Medical Research Unit-2 (NAMRU-2), Jakarta and WHO/SEARO. The main focus during the training was on the laboratory aspects of outbreak investigation.

Strengthening the laboratory involvement during outbreak investigations, development of a network of outbreak investigation team in the country and acceleration of the outbreak investigation and response were among the objectives of the training. Except for two participants among forty, all were from Sri Lanka. The presenters were from NAMRU-2, Jakarta and Sri Lanka. Local participants include epidemiologists, community physicians, microbiologists, parasitologists, pathologists, physicians, entomologists, regional epidemiologists, medical officers of health and other medical officer and regional malaria officers. They were from various governmental and affiliated institutions from both central and provincial level and represented, Epidemiological Unit, Medical Research Institute, Teaching Hospitals & Provincial Hospitals, Universities, Anti Malaria Campaign, Sri Lanka Army, Navy, Air Force & Police and Port Health Office. This was a fine combination of interested parties who could contribute to the control of disease outbreaks.

The programme started with the overview of outbreak surveillance and response. Importance of contributions from laboratory investigation during epidemic/ outbreaks was highlighted. Laboratory equipments required for field investigation, accurate method of phlebotomy, identification of correct specimen for laboratory testing of virology and microbiology, the procedure of matching the laboratory testing with study bias were among component in laboratory aspect of outbreak investigation. During the training past experience in disease outbreak was discussed in detail. This include the malaria in Sri Lanka, dengue fever, influenza A and chickengunya outbreaks in Indonesia, leptospirosis in Japan, SARS epidemic in Vietnam, enteric hepatitis in Asia, cholera in Asia Pacific region and Indonesian, Vietnamese and Cambodian experience in avian flu. In addition, outbreak investigation was discussed taking hypothetical situations as examples.

Designing a study and development of a questionnaire for outbreak investigations was also a part of the training. During the process different descriptive and analytical study designs, namely, cross sectional, case control, cohort and retrospective cohort designs and the errors that can occur in these studies were discussed. Testing of the study questionnaire, methods of data collection, data processing, data analysis, report writing and dissemination of results were also included in the training. Practical sessions on Epi-info statistical software completed the training programme.

In addition to the presentations and practical sessions, the training programme consisted of role-playing and also included an adequate time for open discussions where all participants actively contributed.

At the end of the training the participants were divided into disease specific groups according to their wish, to develop plan of action for each area identified. They are expected to participate actively and coordinate during such specific future outbreaks in addition to the outbreaks occurring in their stations or areas. Each participant would be the coordinator in a given location when need arises during any future outbreak investigation. Participants from other disciplines for instance, Sri Lanka Army, Navy, Air Force and Police will strengthen not only the outbreak investigation but also the post disaster disease surveillance in areas which the other medical staff found difficult to reach. The importance of collaboration among different disciplines during the outbreak investigation and disease control also highlighted during the training. On the conclusion of the training programme, it was decided to establish an informal functioning outbreak investigation network, using the Epidemiological Unit as the core group. To establish and maintain effectively functioning sentinel sites also identified as priorities. The need for providing opportunity for other interested parties to undergo in similar training to further strengthen the capacity building process also identified. It was decided to hold review meetings at least once in every six months among trained participants.

(Continued from page 1)

treatment for patients, and which measures must be taken to prevent the spread of such epidemics. However, among developing countries laboratory capacity varies widely from advanced to almost non-existent. This lack of capacity often reflects a poor understanding of the role of this critical component of the health service. Consequently, laboratory services are frequently under funded and their staff poorly trained and undervalued.

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

06th - 12th August 2005 (32nd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	00	00	00	00	00	02	67	70	-04.3%
Diphtheria	00	00	00	00	00	00	00	00	00	00	06	01	+500.0%
Measles	00	00	00	00	00	00	00	00	00	00	35	55	-36.4%
Tetanus	00	00	00	00	00	00	00	00	00	00	22	31	-29.0%
Whooping Cough	00	00	00	00	01 KR=1	00	00	00	01	01	67	35	+91.4%
Tuberculosis	89	45	10	09	12	03	08	20	196	57	6221	5153	+20.7%

Table 2: Diseases under Special Surveillance

06th - 12th August 2005 (32nd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	111	10	03	02	06	00	01	19	152	407	2870	12033	-76.1%
Encephalitis	00	01 KD=1	00	00	00	00	00	00	01	01	36	73	-50.7%
Human Rabies	00	00	00	00	00	00	00	00	00	03	35	58	-39.7%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

Establishment and strengthening of various laboratories is crucial in making the surveillance system more effective and responsive. Timely and reliable confirmation of diagnosis is a core activity for prompt and specific response.

Apart from diagnosis, the laboratory would be required to monitor antimicrobial resistance and changes in the strains of disease agents and be able to assist the epidemiologists in understanding the spread of the disease through detailed characterization of the agents and through molecular characterization, if needed. It would also necessitate maintaining pathogen repositories.

This calls for thorough assessment of the current diagnostic support services in each country at each level and providing them with the infrastructure needed such as space, laboratory equipment, diagnostic reagents and disposables. In-service training of laboratory personnel in simple and cost-effective rapid diagnostic techniques should be proactively promoted and supported.

A network of referral laboratories with higher level of diagnostic skill is required to be set up at least among the university laboratories. National referral laboratories, WHO collaborating laboratories etc should be appropriately networked for strengthening and augmenting referral support services.

The Editor wishes to thank Dr Sriyani Dissanayake for her contribution in preparation of this article.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

06th - 12th August 2005 (32nd Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	40	1083	01	166	00	00	00	34	00	105	02	65	00	04	00	82	69
Gampaha	61	651	03	168	00	02	03	38	00	42	14	112	00	01	01	70	79
Kalutara	10	153	03	328	00	00	01	31	00	77	03	70	00	00	00	26	80
Kandy	08	226	06	297	01	01	02	72	02	11	00	31	01	55	00	54	73
Matale	01	18	00	230	00	02	00	19	00	08	00	33	00	00	02	08	75
Nuwara Eliya	01	08	05	242	00	00	03	135	00	290	00	07	00	20	01	18	86
Galle	02	35	02	87	00	02	01	09	00	02	02	37	01	08	00	08	63
Hambantota	01	16	04	159	00	00	00	06	00	36	00	38	01	57	01	12	90
Matara	00	50	02	138	00	01	01	20	00	27	00	103	01	91	00	06	50
Jaffna	00	08	00	81	00	01	02	265	00	18	00	01	00	83	00	48	38
Kilinochchi	01	02	07	25	00	00	00	05	00	26	00	00	00	00	01	06	50
Mannar	00	00	03	24	00	00	01	36	00	25	00	00	00	01	01	10	83
Vavuniya	00	23	05	76	00	02	06	172	01	10	00	01	00	00	00	04	100
Mullaitivu	00	00	00	13	00	00	00	11	00	02	00	00	00	03	00	04	100
Batticaloa	00	03	00	24	00	01	02	05	00	02	00	02	00	05	03	207	67
Ampara	00	08	00	41	00	00	00	04	00	04	00	07	00	00	00	08	29
Trincomalee	01	44	08	225	00	00	02	31	00	27	00	06	00	03	02	123	78
Kurunegala	05	71	03	266	00	02	02	46	00	34	00	14	00	08	02	50	71
Puttalam	01	88	04	44	00	02	04	126	00	04	00	12	00	00	01	27	89
Anuradhapura	00	51	01	97	00	01	00	17	78	105	00	67	00	16	00	36	58
Polonnaruwa	00	30	00	28	00	00	00	67	00	01	00	19	00	01	00	16	57
Badulla	00	17	05	391	00	00	02	161	00	13	00	52	00	57	04	121	47
Monaragala	01	04	04	102	00	00	00	26	00	07	01	84	02	56	01	50	40
Ratnapura	14	209	03	433	00	15	03	239	00	17	01	54	00	11	02	27	73
Kegalle	05	68	04	270	00	01	00	22	00	11	02	70	00	19	02	67	70
Kalmunai	00	04	01	35	00	03	00	10	00	01	00	00	00	03	05	131	55
SRI LANKA	152	2870	74	3990	01	36	35	1607	81	905	25	885	06	502	29	1219	66

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 20th August 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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Death certificate - an important source of health statistics

Under Section 31 of the Births & Deaths Registration Act (Cap 129) it is the responsibility of the attending doctor to state the cause of death, if known, when a patient he is treating dies of a natural cause. The cause of death is a statement consisting of (a) Immediate – disease or conditions directly leading to death, (b) Antecedent – morbid conditions if any giving rise to such disease or condition, stating the underlying condition last, (c) contributory – other significant conditions contributing to death but not related to the disease or conditions directly leading to it. The certificate of cause of death is a document which contains the name, age and the address of the deceased, the period of which the deceased was under treatment by the certifying physician and the cause of death.

The death certificate is the source for national mortality statistics and is useful to determine which medical conditions receive research and development funding, to set public health goals, and to measure health status at local, national, and international levels. These mortality data are valuable to physicians indirectly by influencing funding which supports medical and health research which may alter clinical practice and directly as a research tool.

Since statistical data derived from death certificates can be no more accurate than the information on the certificate, it is very important that all persons concerned with the registration of deaths strive not only for complete registration, but also for accuracy and promptness in reporting these events. Although the completeness of the death certification is high in Sri Lanka there is still room to develop the accuracy especially in relation to the cause of death.

In certifying the cause of death, any disease, abnormality, injury, or poisoning, if believed to have adversely affected the decedent, should be reported. If the use of alcohol and/or other substance, a smoking history, a recent pregnancy, injury, or surgery was believed to have contributed to death, then this condition should be reported.

The conditions present at the time of death may be completely unrelated, arising independently of each other; they may be causally related to each other, that is, one condition may lead to another which in turn leads to a third condition; and so forth. Death may also result from the combined effect of two or more conditions. As can be seen (see Figure 1), the cause-of-death section consists of two parts. The first part is for reporting the sequence of events leading to death, proceeding backwards from the final disease or condition resulting in death. Other significant conditions which contributed to the death, but did not lead to the underlying cause, are reported in Part II. For statistical and research purposes, it is important that the causes of death and, in particular, the underlying cause of death be reported as specifically and as precisely as possible. For clarity, parenthetical statements and abbreviations should not be used when reporting the cause of death. Every cause-of-death statement is coded and tabulated according to the latest revision of the International Classification of Diseases.

Statistically, mortality research focuses on the underlying cause of death because public health interventions seek to break the sequence of causally related medical conditions as early as

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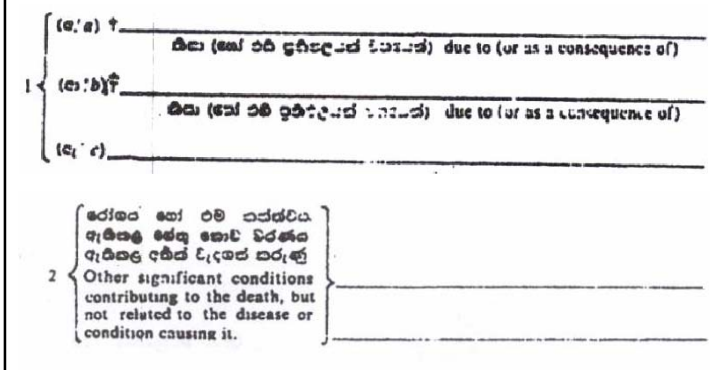
possible. However, all cause information reported on death certificates is important. If an organ system failure such as congestive heart failure, hepatic failure, renal failure, or respiratory failure is listed as a cause of death, its etiology on the line(s) beneath it should be always reported (for example, renal failure due to Type I diabetes mellitus).

When indicating neoplasm as a cause of death, it should be included: the primary site or that the primary site is unknown; whether benign or malignant; the cell type or that the cell type is unknown; the grade of neoplasm; and the part or lobe of organ affected. (For example, a primary well-differentiated squamous cell carcinoma, lung, left upper lobe).

For each fatal injury (for example, stab wound of chest), the trauma (for example, transection of subclavian vein), and impairment of function (for example, air embolism) which contributed to death should be reported always.

Part I & II of Certificate of Cause of Death



In Part I of the cause-of-death section, the immediate cause of death is reported on line (a). This is the final disease, injury, or complication directly causing the death. The immediate cause of death must always be reported on line (a). It can be the sole entry in the cause-of-death section if that condition is the only condition causing the death. The immediate cause does not mean the mechanism of death or terminal event (for example, cardiac arrest or respiratory arrest) and should not be reported as the immediate cause of death as it is a statement not specifically related to the disease process, and it merely attests to the fact of death. Therefore, the mechanism of death provides no additional information on the cause of death.

Line (b) is to report the disease, injury, or complication, if any, that gave rise to the immediate cause of death reported on line (a). If this in turn resulted from a further condition, it is recorded on line (c). For as many conditions as are involved, the full sequence should be written, one condition per line, with the most recent condition at the top, and the underlying cause of death reported on the lowest line used in Part I. If more than four lines are needed, additional lines may be added (writing "due to" between conditions on the same line is the same as drawing an additional line). If the immediate cause of death arose as a complication of or from an error or accident in surgery or other medical procedure or treatment, it is important to report what condition was being treated, what medical procedure was performed, what the complication or error was, and what the result of the complication or error was.

All other important diseases or conditions which were present at the time of death and which may have contributed to the death, but did not lead to the underlying cause of death listed in Part I or were not reported in the chain of events in Part I, should be recorded in Part II of the cause-of-death section (other significant conditions). More than one condition can be reported per line in Part II.

Multiple conditions and sequences of conditions resulting in death are common, particularly among the elderly. When there are two or more possible sequences resulting in death, or if two conditions seem to have added together, the sequence thought to have had the greatest impact should be written in Part I. Other conditions or conditions from the other sequence(s) should be reported in Part II. For example, in the case of a diabetic male with chronic ischemic heart disease who dies from pneumonia, his certifying physician must choose the sequence of conditions that had the greatest impact and report this sequence in Part I. One possible sequence that the certifier might report would be "pneumonia" due to (or as a consequence of) "diabetes mellitus" in Part I with chronic ischemic heart disease reported in Part II. Another possibility would be "pneumonia" (due to or as a consequence of) "chronic ischemic heart disease" entered in Part I with diabetes mellitus reported in Part II. Or the certifier might consider "pneumonia" to be due to (or as a consequence of) "ischemic heart disease that was due to (as a consequence of) "diabetes mellitus" and report this entire sequence in Part I. Since these three different possibilities would be coded very differently, it is important for the certifying physician to decide which sequence most accurately describes the conditions causing death.

The elderly decedent should have a clear and distinct etiological sequence for cause of death, if possible. Terms such as senescence, infirmity, old age, and advanced age have little value for public health or medical research. When a number of conditions resulted in death, the physician should choose the single sequence that, in his or her opinion, best describes the process leading to death, and place any other pertinent condi-

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

13th – 19th August 2005 (33rd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	01 AM=1	00	00	00	00	01	02	68	72	-05.6%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	00	00	00	00	00	00	00	00	10	36	56	-35.7%
Tetanus	00	00	00	00	00	00	00	00	00	00	22	31	-29.0%
Whooping Cough	02 CB=1KL=1	00	02 MT=2	00	00	00	00	02 RP=1KG=1	06	00	76	37	+105.4%
Tuberculosis	98	00	14	00	00	26	00	00	138	260	6359	5413	+17.5%

Table 2: Diseases under Special Surveillance

13th – 19th August 2005 (33rd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	137	15	13	00	05	07	03	24	204	267	3114	12360	-74.8%
Encephalitis	00	00	00	01 VA=1	00	01 AP=1	00	00	02	00	39	73	-46.6%
Human Rabies	00	00	00	00	00	00	00	00	00	01	35	60	-41.7%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

tions in Part II. "Multiple system failure" could be included in Part II, but the systems need to be specified to ensure that the information is captured. The infant decedent should have a clear and distinct etiological sequence for cause of death, if possible. "Prematurity" should not be entered without explaining the etiology of prematurity. Maternal conditions may have initiated or affected the sequence that resulted in infant death, and such maternal causes should be reported in addition to the infant causes on the infant's death certificate (e.g., hyaline membrane disease due to prematurity, 28 weeks due to placental abruption due to blunt trauma to mother's abdomen).

If after careful consideration, the physician cannot determine a sequence which led to death, then the death should be reported to the appropriate authority for an inquest where an autopsy can be ordered to explore the cause of death.

Source:

Sri Lanka Medical Council. Guidelines for Medical Practioners & Dentists. Medical & Death Certificates. Sri Lanka Medical Council. 2004.

Department of Health and Human Services. Physician's Handbook on Medical Certification of Death. CDC, 2003.

Weekly Epidemiological Report is now available on line:
<http://www.epid.gov.lk/wer.htm>

Table 3: Selected notifiable diseases reported by Medical Officers of Health

13th - 19th August 2005 (33rd Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	64	1163	07	178	00	00	00	34	00	105	04	69	00	04	02	84	85
Gampaha	65	720	01	172	00	02	02	41	08	50	05	117	00	01	06	76	71
Kalutara	08	162	10	340	00	00	01	32	00	77	00	70	00	00	01	27	100
Kandy	14	246	03	304	00	01	02	75	00	12	02	34	03	59	07	61	68
Matale	01	20	04	238	00	02	00	19	02	10	00	33	00	00	01	09	67
Nuwara Eliya	00	09	08	251	00	00	06	141	00	290	00	07	00	20	02	20	86
Galle	05	40	04	92	00	02	01	10	00	02	00	38	00	08	00	08	63
Hambantota	03	19	13	173	00	00	00	06	00	36	00	38	00	58	00	12	90
Matara	05	59	03	141	00	02	00	21	00	29	02	108	07	102	00	06	86
Jaffna	00	08	05	95	00	01	00	266	00	18	00	01	00	86	00	48	38
Kilinochchi	00	02	00	25	00	00	00	05	00	26	00	00	00	00	00	06	50
Mannar	00	00	00	24	00	00	00	36	00	25	00	00	00	01	00	10	83
Vavuniya	00	23	09	85	01	03	03	175	02	12	00	01	00	00	00	04	75
Mullaitivu	00	00	00	13	00	00	03	14	00	02	00	00	00	03	00	04	00
Batticaloa	00	03	03	27	00	01	00	05	01	03	00	02	00	05	12	220	78
Ampara	00	09	02	55	00	00	00	04	00	08	00	09	00	00	00	11	29
Trincomalee	00	44	01	226	00	00	00	31	04	31	00	06	00	03	02	125	67
Kurunegala	03	74	04	273	00	02	02	49	00	34	00	14	00	08	00	50	88
Puttalam	02	90	07	51	00	02	04	130	00	04	01	13	00	00	00	27	89
Anuradhapura	00	52	01	99	01	02	00	17	00	105	00	68	00	16	01	37	68
Polonnaruwa	07	37	02	30	00	00	03	70	00	01	00	19	00	01	00	16	100
Badulla	01	18	09	408	00	00	03	165	00	13	02	54	02	60	07	130	73
Monaragala	02	08	05	110	00	00	00	28	07	14	00	86	00	63	00	52	60
Ratnapura	18	228	08	441	00	15	03	242	00	17	00	54	00	11	10	37	80
Kegalle	06	76	04	277	00	01	01	23	00	11	02	73	01	20	02	69	60
Kalmunai	00	04	02	38	00	03	02	15	00	01	00	00	00	03	10	145	55
SRI LANKA	204	3114	115	4166	02	39	36	1654	24	936	18	914	13	532	63	1294	73

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 27th August 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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ON STATE SERVICE

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WER SRI LANKA - 2005

Vol. 32 No. 35 **27th August - 02nd September 2005**

Stress at workplace

Without a certain amount of stress it will be difficult to achieve demands and to face challenges. This requirement is identified as "Eustress", which energizes a person psychologically, physically and motivates to learn new skills and master their job. Once the challenge is met successfully, a person feels relaxed and satisfied. This is important for a healthy and productive output in work.

On the other hand, harmful stress - "distress" occurs when the requirement of job do not match the capabilities, resources or needs of the worker. It is primarily depend on the person's characteristics such as personality, perceived self efficacy, self esteem and coping style versus the working conditions. In other words what is stressful for one person may not be so for some one else.

Irrespective of whether it is a white collar or a blue collar job, any working person is at risk of being stressed. The causes of stress or stressors that encounter in a working environment can be categorized in to several aspects (Table 1).

The medical concern of stress is that its impact on the overall health. The human body deals with all types of stress in the same way. The automatic response of the body to deal with short term stress is very effective and is known as "fight or flight" response. Experiencing stress for long periods of time will activate the same system, without getting a chance to "turn off". It will cause the condition called "generalized stress response".

Features of "generalized stress response"

- Increased blood pressure
- Increased metabolism (reflected by increased heart rate and deep respiration etc.)
- Decrease in protein synthesis, peristalsis, immune and allergic response systems.
- Increased cholesterol and fatty acids in blood (for energy production systems)
- Localized inflammation (redness, swelling, heat and pain)
- Faster blood clotting
- Increased production of blood sugar
- Increased gastric acid secretion

Job stress and health

It has been identified that there is an association between job stress and workers' health. Early warning sings of job stress may be either physical or psychological and includes headache, sleep disturbances, difficult to concentrate, short temper, gastro-intestinal disturbances, job dissatisfaction, alcoholism, perpetrating problems within the family, low morale and high employment turnover.

Many studies suggested that psychologically demanding jobs that allow employees little control over the work process increases the risk of cardiovascular disease. It is widely believed that job stress increases the risk for development of back and upper extremity musculoskeletal disorders. There is evidence that differences in rates of mental health problems such as depression and burn out are related to the differences in job stress levels. Economic and life style differences between occupations may also contribute to this situation. Stressful working conditions too interfere with safe work practices and set the stage for injuries at work. Suicide, cancer, gastric ulcer and impaired immune functions have shown some relationship with stressful working conditions. However, more research based evidence is needed before firm conclusions are drawn on this.

Stress, health and productivity

Studies show that stressful working conditions are associated with increased absen-

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teeism, tardiness and intentions by workers to quit their jobs. Health care expenditures are nearly 50% greater than the average for workers who report high levels of stress.

Research has identified some organizational characteristics that are associated with healthy, low stress work and also with high levels of productivity. Examples of these characteristics include recognition of employees for good work performance, opportunities for career development, an organizational culture that values the individual worker and managerial activities that are consistent with organizational values. Improvement of job performance observed after establishment of employee assistance programmes and stress prevention programmes which included employee and management education on job stress, changes in organizational policies and procedures to reduce organizational sources of stress etc., further strengthens these facts.

Prevention of job stress

Self directed activities

In many cases, the origin of the stress cannot be changed immediately. Therefore, alternatives that help to maintain a good mental health is essential. Laughing is one of the easiest and best ways to reduce stress. Sharing a joke with co-workers, having special friend/s, watching comedies, reading comics and trying to see humour even in most difficult situations are some of simple practices to keep stress away.

Learning to relax is also important. Taking several deep breaths intermittently throughout the day or having regular stretch breaks are also help to relax.

Each day should be begin with taking charge of the situation by spending about ten minutes to prioritize and organize the day's activities. It is necessary to be honest with colleagues, and also should be constructive making practical suggestions. Being realistic about what the worker can change will prevent unnecessary stress.

Table 1: Stressors in a working environment

Categories of job stressors	Examples
Factors unique to the job	※ Work load (over load /under load) ※ Pace/ variety/ meaningfulness of work ※ Autonomy (e.g. the ability to make own decisions about the self or about a specific task) ※ Shift work / hours of work ※ Physical environment (noise, air quality etc.) ※ Isolation at the work place (emotional or working alone)
Role in the organization	※ Role conflict (conflicting job demands, multiple supervisors/ managers) ※ Role ambiguity (lack of clarity about responsibilities, expectations, etc.) ※ Level of responsibility
Career development	※ Under and over promotion ※ Job security (fear of redundancy either from economy, or a lack of tasks or work to do) ※ Career development opportunities ※ Overall job satisfaction
Interpersonal relationships at work	※ Supervisors ※ Co-workers ※ Subordinates ※ Threat of violence, harassment etc.
Organizational structure	※ Participation in decision making ※ Management style ※ Communication patterns

Work place culture

Like any other culture, workplace culture is a set of behaviours and codes that people use to govern their interactions with each other. This includes formal, written work place policies as well as informal "rules of the road" that worker learn with experience. Adjusting to the "work place culture" or "corporate culture" will be an important preliminary step in managing the stressors.

Worker should analyze the work place culture and if necessary, has to change the habits accordingly to minimize undue stress. To accurately evaluate corporate or workplace culture, worker should consider the following aspects of his/her work place.

1. The preferred communication style: Whether information is conveyed formally in writing, at scheduled meetings, e-mailing the group or is it word of mouth. Effective communication is a foundation of good stress management and every one may need to make compromises to achieve an efficient style that works for an individual group.
2. Hierarchy: How is the "chain of command" defined? How rigidly do co-workers adhere to a hierarchical structure? What is an individual's position? If he/she is expected to train or supervise others, how formal should one keep relationship with the others?
3. Team work: Whether information is shared freely or expected to work entirely on their own. Discussing the expected level of team work with co-workers is useful. It is easier to ward off stresses and conflicts before they occur than to resolve them after arisen.
4. Leadership: What is the role of the superior? How are evaluation and criticism conveyed - in periodic formal reports or offhand comments? This will depend largely on the character of an individual and his/ her own management style. It is fair to ask superiors what they expect in terms of feedback and how frequently.
5. Appearance: Personal appearance can have a large impact on impression of others – co-workers, superiors and subordinates. When there is no dress code, adopting a suitable dress style prevents being a subject to others' humour.
6. Office friendships: Understanding the extent of personal friendships that exists in the working environment is important. There should be an understanding regarding the level of openness and disclosure of personal matters among colleagues and across hierarchical lines.

Organizational activities to reduce workers' stress

In addition to the workers effort to prevent the stressful conditions, there are organizational activities that will reduce workers' stress. Managers should have to keep in mind that

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

20th - 26th August 2005 (34th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 CB=1	01 NE=1	00	00	00	00	00	00	02	00	70	72	-02.8%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	00	00	00	00	00	00	00	00	01	35	57	-38.6%
Tetanus	00	00	00	00	00	00	00	00	00	01	23	32	-28.1%
Whooping Cough	01 CB=1	00	00	00	00	00	00	00	01	00	76	37	+105.4%
Tuberculosis	51	59	12	28	19	00	09	08	176	313	6535	5726	+14.1%

Table 2: Diseases under Special Surveillance

20th - 26th August 2005 (34th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	113	16	11	00	05	04	00	12	161	198	3270	12684	-74.2%
Encephalitis	00	00	00	00	00	00	00	01 RP=1	01	00	42	73	-42.5%
Human Rabies	00	00	00	00	00	00	01 BD=1	00	01	02	34	62	-45.2%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

these activities will result not merely workers' welfare but also a healthy environment, an improved out put of the organization and more profits.

- Ensure that the workload is in line with workers' capabilities and resources.
- Design jobs to provide, stimulation and opportunities for workers to use their skills meaningfully.
- Clearly define workers' roles and responsibilities.
- Give workers opportunities to participate in decision making process that affect their jobs.
- Improve communications; reduce uncertainty about career development and future employment prospects.
- Provide opportunities for social interaction among workers.
- Establish work schedules that are compatible with demands and responsibilities outside the job.

No standardized approaches or simple manuals exist to develop stress prevention programmes. Lack of apparent or widespread physical or psychological signs is not a justifiable reason to ignore concerns about job stress since there may no clues, especially if employees are fearful of losing their jobs.

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The Editor wishes to thank Dr Sriyani Dissanayake for her contribution to this article.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

20th - 26th August 2005 (34th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	52	1215	07	185	00	00	02	36	00	105	00	69	00	04	03	87	69
Gampaha	48	768	04	176	00	02	02	43	01	51	04	121	00	01	00	76	57
Kalutara	13	175	07	347	00	00	02	34	00	77	01	71	00	00	01	28	60
Kandy	14	256	11	315	00	01	06	81	00	12	02	36	02	61	02	63	73
Matale	02	22	04	242	00	02	00	19	00	10	00	33	00	00	00	09	33
Nuwara Eliya	00	09	00	251	00	00	04	145	00	290	01	08	00	20	01	21	86
Galle	04	44	02	94	00	02	00	10	00	02	00	38	00	08	00	08	50
Hambantota	04	23	11	184	00	00	01	07	05	41	00	38	02	60	01	13	80
Matara	03	62	02	143	00	02	00	21	00	29	00	107	02	104	00	06	43
Jaffna	00	08	22	117	00	01	07	273	00	18	00	01	00	86	02	50	50
Kilinochchi	00	02	00	25	00	00	01	06	00	26	00	00	00	00	00	06	25
Mannar	00	00	03	27	00	00	02	38	00	25	00	00	00	01	00	10	17
Vavuniya	00	23	05	90	00	03	00	175	01	13	00	01	00	00	00	04	50
Mullaitivu	00	00	00	13	00	00	00	14	00	02	00	00	00	03	00	04	100
Batticaloa	00	03	00	27	00	01	01	06	00	03	00	02	00	05	05	225	22
Ampara	00	09	03	60	00	00	01	05	00	08	00	09	00	00	00	11	29
Trincomalee	00	44	08	247	00	00	01	32	00	31	00	06	00	03	04	129	56
Kurunegala	03	77	03	276	00	02	01	50	00	34	02	16	02	10	02	52	88
Puttalam	02	92	03	54	00	02	06	136	00	04	00	13	00	00	01	28	56
Anuradhapura	03	55	03	102	00	02	00	17	00	105	01	69	00	16	00	37	47
Polonnaruwa	01	38	00	30	00	00	01	71	00	01	00	19	00	01	02	18	86
Badulla	00	18	07	419	00	00	01	166	00	13	01	55	00	60	06	136	53
Monaragala	00	08	04	114	00	01	02	30	03	17	00	86	00	63	00	52	30
Ratnapura	09	236	15	462	01	16	04	250	00	17	05	59	00	11	08	45	60
Kegalle	03	79	04	281	00	02	01	24	00	11	01	74	03	23	03	72	60
Kalmunai	00	04	02	40	00	03	01	18	00	01	00	00	00	03	06	151	18
SRI LANKA	161	3270	130	4321	01	42	47	1707	10	946	18	931	11	543	47	1341	54

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 03rd September 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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Vol. 32 No. 36 **03rd - 09th September 2005**

SRI LANKA - 2005

WEER

Avian Influenza
– Are we in for a global catastrophe?

The situation of avian influenza is evolving rapidly in Asia. Since 2003, 12 countries have reported outbreaks in poultry or wild birds. Since beginning in late July 2005, H5N1 virus which is highly pathogenic has been expanding its geographical spread. Russia and Kazakhstan reported outbreaks of avian influenza in poultry and confirmed H5N1 virus as the causative agent in as recent as early August. Deaths in migratory birds infected with the virus have also been reported. Outbreaks in these countries are attributed to contact between domestic birds and wild fowls via shared water sources. The appearance of the highly pathogenic virus in two countries is an ample testimony to the fact that the virus geographically spreads its tentacles. In early August, Mongolia witnessed the death of 89 migratory birds at two lakes in the North and avian influenza type A had been identified as the cause. In this incident investigations are currently being performed at the WHO to determine the virus strain. During the same period, an outbreak of H5N1 in poultry was detected in Tibet, China.

The Russian outbreak in poultry which was initially confined to Siberia has spread progressively towards the West affecting 6 administrative regions. In the neighbouring Kazakhstan, several villages bordering the initial outbreak site in Siberia have now experienced disease in poultry. Large farms as well as small backyard flocks were affected in these two countries bringing death toll of poultry both as a result of the disease and destruction to 12000 in Russia and 9000 in Kazakhstan.

These two outbreaks in the former Soviet republics confirm the spread of the H5N1 virus beyond their initial focus in South East Asian countries. Despite aggressive control measures, H5N1 virus has been predicted to be detected in many parts of the South East Asia.

Control of avian influenza infection in the population of wild bird population is neither feasible nor promoted. Wild water fowl has been the widely known natural reservoir of all influenza A viruses. Migratory birds which are the natural reservoirs play an important role in the spread of the virus as they carry the virus over long distances without themselves developing symptoms. Detection of highly pathogenic avian influenza viruses among migratory birds has been rare and the role of the migratory birds in the spread of highly pathogenic avian influenza remains poorly understood.

Very large die offs of migratory birds are considered unusual and act as an eye opener to the outbreak of avian influenza. The virus H5N1 isolated in the outbreak at Qinghai Lake in which deaths of more than 6000 birds occurred was similar to the one that has been in circulation in south East Asia for the last two years. The analyses of virus from the outbreak in Russia showed similarity with viruses isolated from the migratory birds in Qinghai Lake. The viruses in the Mongolian outbreak are being analyzed in WHO laboratories and it will shed light on the spread of the disease. Thus, monitoring the spread and evaluation of Avian H5N1

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viruses in birds and comparing results with previously characterized H5N1 viruses is an essential activity for assessing the risk of pandemic influenza.

The virus detected in outbreaks in the former Soviet States has reportedly demonstrated in previous outbreaks in Hong Kong in 1997, 2003 and in South East Asia since 2004 that it can cross the species barrier to humans and cause severe disease with high fatality. The same risk of human cases exists in areas newly affected with H5N1 disease in poultry. In Thailand it has been demonstrated that scavenging ducks play an important role in spreading the virus across many farms as they move from one to the other without becoming sick of themselves.

Japan, Malaysia and the Republic of Korea have successfully controlled poultry outbreaks of H5N1 avian influenza. It may need drastic measures recommended by the FAO/OIE/WHO to contain such outbreaks. The intensity of measures followed was best demonstrated in the 2003 outbreak in Netherlands which was caused by highly pathogenic H7N7 strain. The price paid for the containment of the outbreak was the destruction of around 30 million poultry.

The South East experience demonstrated that the human cases were rare. So far human cases have been reported from four countries namely Vietnam, Cambodia, Thailand, and Indonesia. Among the cases reported so far, the majority were from Vietnam. The case fatality rate was around 50% although it was difficult to calculate it accurately since some mild cases may not have been detected. Virus does not transmit easily from poultry to humans. Human to human transmission was negligible. Most of the cases have been linked to direct exposure to dead or diseased poultry, notably during slaughtering, defeathering and food preparation. No cases have been confirmed in poultry workers or cullers. No cases have been linked to the consumption of properly cooked poultry meet or eggs. However, factors related to farming densities and systems may also influence the risk of transmission to humans. As of 1st of September 2005, the H5N1 virus has caused 112 human cases of which 57 have been fatal. Two features have been noteworthy: most cases have been apparently healthy children and young adults and the case fatality rates were high.

There is a growing concern regarding the imminent threat of an influenza pandemic. Human cases continue to occur in newer areas, countries and likely to do so in the future as H5N1 has now become endemic in Asia. The host range of H5N1 is expanding. Outbreaks in animals are occurring among diverse array of wild birds as well as domestic birds such as chicken, ducks geese and animal species such as cats, tigers and pigs. The increasing number of animals infected means that there is a greater possibility of human exposure to an influenza virus originating from birds and animals. Consequently, there is a real possibility that human beings may serve as the mixing vessel for reassortment of avian and human influenza genes to produce a novel subtype that could trigger a pandemic. Moreover, humans living closely with birds and pigs increase the possibility of reassortment.

H5N1 subtype has established endemicity in birds in large parts of Asia and this heightens the possibility of pandemic potential. Since of late, this virus has demonstrated to be more pathogenic in poultry although the poultry to human and human to human transmission is low. The death of migratory birds bears testimony to the changing nature of the virus.

One reason why the epidemiologists alarm an impending pandemic is the notable similarities of the current situation with the background of 1918 pandemic. As in 1918, virus H5N1 is unusually virulent. Given the absence of protective immunity in human, it may evolve in to a pandemic strain, by adapting to humans through mutation or reassortment with a human influenza strain. The severity of the disease is high although the case fatality is decreasing and cases are clustering among young and healthy people. The non exposure of the population to the H 5 subtype means that the whole population is vulnerable to H5N1 like pandemic virus. All these occur in the background of the mounting evidence that the virus has continued to be in evolution since the out break in 1997. Another highly worried concern is the possible development and transmission among humans of a mutated influenza virus of the current avian strain to which human beings have no immunity. In such an event, in addition to the colossal amount of deaths, potential socio- economic consequences will be of an unimaginable proportion.

There are three pre requisites for an avian influenza pandemic: emergence of a novel virus to which all are susceptible, ability of the new virus to replicate and cause disease in humans and efficient transmission from human to human. The H5N1 virus has achieved the first two and only the last one remains to be achieved.

Since the latter part of 2003, four countries in the South- East Asia have accounted for 112 human cases and 57 deaths due to avian influenza. Epidemiological patterns are changing in Vietnam, the country with the longest running epidemic. Number and size of clusters have increased. Incubation periods have lengthened. Age range has expanded from 17-30 years in 2003 to 1-80 years in 2005. Milder diseases, low case fatality and more asymptomatic infection in close contacts have been striking features of late. These changes have been accompanied by an increasing pathogenicity of avian species. All the changes provide ample evidence of adaptation of the virus to human beings indicating thereby that the globe

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

27th August - 02nd September 2005 (35th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	01 KR=1	00	00	00	01	02	71	74	-04.1%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	00	00	00	00	00	00	00	00	01	37	58	-36.2%
Tetanus	00	01 NE=1	00	00	00	00	00	00	01	00	23	34	-32.4%
Whooping Cough	00	00	02 GL=1MT=1	00	00	00	00	00	02	00	80	37	+116.2%
Tuberculosis	42	91	06	32	15	00	00	21	207	232	6742	5958	+13.2%

Table 2: Diseases under Special Surveillance

27th August - 02nd September 2005 (35th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	106	12	07	01	03	03	04	04	140	218	3458	13044	-73.5%
Encephalitis	00	00	00	00	00	00	00	01 RP=1	01	00	43	73	-41.1%
Human Rabies	00	00	00	00	00	00	00	00	00	00	34	63	-46.0%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

may be now in the stage of pre pandemic.

There is mounting evidence that the future influenza epidemic is imminent. Nobody can be sure when it will happen, how quickly it will spread and what the proportion of morbidity, mortality and the degree of economic loss would be. By all existing standards, the forecast would be that 25% of the global population will be affected with the death sentence falling on 2-7 million of them. It has been predicted that a future pandemic will invariably lead to a global economic collapse.

Sources:

WHO. Geographical spread of H5N1 avian influenza in birds - update 28. Situation assessment and implication for human health. 2005. Available at: http://www.who.int/csr/don/2005_08_18/en/index.html

WHO. Avian Influenza: Responding to the Pandemic Threat. World Health Organization. Regional Office for South-East Asia. 2005

The Editor wishes to thank Dr. Ranjan Wijesinghe for his contribution in preparation of this article to the WER.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

27th August - 02nd September 2005 (35th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	48	1279	02	186	00	00	00	36	01	106	00	69	00	04	01	88	92
Gampaha	46	821	09	184	00	02	04	46	00	51	10	133	00	02	11	87	93
Kalutara	12	190	04	351	00	00	01	35	00	77	02	73	00	00	00	28	90
Kandy	07	269	05	320	00	01	01	82	00	12	00	36	01	62	00	63	73
Matale	05	27	03	245	00	02	00	19	00	10	00	34	00	00	01	10	75
Nuwara Eliya	00	09	05	256	00	00	04	149	00	290	01	09	00	20	00	21	86
Galle	01	46	03	97	00	02	00	10	00	02	02	42	00	08	00	08	63
Hambantota	01	25	09	193	00	00	01	08	00	41	01	39	00	60	00	13	100
Matara	05	69	00	143	00	02	00	21	00	29	01	114	05	109	00	07	71
Jaffna	01	09	01	118	00	01	03	276	00	18	00	01	00	86	00	50	38
Kilinochchi	00	02	01	26	00	00	00	06	00	26	00	00	00	00	00	06	25
Mannar	00	00	00	27	00	00	00	38	00	25	00	00	00	01	01	12	83
Vavuniya	00	23	00	90	00	03	00	175	00	13	00	01	00	00	00	05	50
Mullaitivu	00	00	00	13	00	00	00	14	00	02	00	00	00	03	01	05	100
Batticaloa	00	03	01	28	00	01	00	06	00	03	00	02	00	05	01	226	56
Ampara	00	09	04	60	00	00	00	05	00	08	00	09	00	00	00	11	29
Trincomalee	00	44	05	236	00	00	00	32	04	35	00	06	00	03	01	130	56
Kurunegala	01	78	10	286	00	02	06	56	00	34	00	16	00	10	01	53	76
Puttalam	02	94	01	53	00	02	00	133	00	04	03	16	00	00	00	28	78
Anuradhapura	03	59	04	106	00	02	00	17	00	105	01	70	00	16	00	37	89
Polonnaruwa	00	38	02	32	00	00	01	72	00	01	00	19	00	01	00	18	100
Badulla	03	21	03	421	00	00	00	166	00	13	00	55	02	62	02	140	73
Monaragala	01	10	06	120	00	01	01	31	00	17	02	88	06	70	07	61	80
Ratnapura	01	246	07	462	01	17	03	249	00	17	01	60	00	11	07	52	67
Kegalle	03	83	02	282	00	02	00	24	00	11	03	78	01	24	00	72	80
Kalmunai	00	04	02	41	00	03	00	16	00	01	00	00	00	03	04	155	55
SRI LANKA	140	3458	89	4376	01	43	25	1722	05	951	27	970	15	560	38	1386	74

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 10th September 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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Comments and contributions for publication in the WER Sri Lanka are welcome. However, the editor reserves the right to accept or reject items for publication. All correspondence should be mailed to The Editor, WER Sri Lanka, Epidemiological Unit, P.O. Box 1567, Colombo or sent by E-mail chepid@sltnet.lk

ON STATE SERVICE

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WEEKLY EPIDEMIOLOGICAL REPORT

A publication of the Epidemiological Unit,

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Vol. 32 No. 37 **10th - 16th September 2005**

WER SRI LANKA - 2005

Use of pesticides & committing suicide using pesticides

Pesticides are perhaps the most toxic group of chemicals that are used by the unskilled rural peasants in their day to day living. Most often these rural farmers are also deprived of many other aspects of social needs. Even at present in Sri Lanka the rural agricultural districts are the ones which are benefited with the least amount of economic development. Whether it is in the scope of roads, transport, health, education or housing it is the same.

The group of chemicals in relation to pesticides they use, consists of products ranging from household items to extremely hazardous products which should only be used by the professionals such as fumigators. Because of its versatile nature of users, pesticides naturally have become the most important group of chemicals in common use.

Pesticides are not manufactured in Sri Lanka. They are either imported as ready-to-use products (formulations in retail packs) or in bulk to be re-packed or as technical ingredients for local formulations. By 2000 the average CIF value of the country's pesticide requirement was Rupees 1349.5 million and of this Rupees 270.6 million was allocated for the import of technical materials for local formulation while Rupees 1078.9 million was allocated for direct import of formulated products. (Table 1)

In 2002 approximately 50 insecticide active ingredients, 30 fungicide active ingredients and 25 weedicide active ingredients were registered for marketing and use in Sri Lanka. Total annual pesticide consumption was estimated to be 1696 metric tons of active ingredients at a cost of Rupees 4628 million in 2000.

Pesticides remain an indispensable crop protection tool in Sri Lanka. According to the WHO/ UNEP data for the year 1992, of the average load of pesticides applied on the environment, Sri Lanka ranks above Africa & Latin America. The Sri Lankan situation is comparable with the highly industrialized nations such as USA (1,490 g/ha.) and Europe (1870 g/ha.). However these developed countries possess all the latest advancement in technologies along with necessary infrastructure and other resources to ensure the safe use of pesticides to avoid any negative impact on human health and the environment. Due to the extensive and indiscriminate use of pesticides in the developing world including Sri Lanka, numerous problems have been encountered and it is believed that the most important issue is its wide use for the purpose of committing suicide.

The first few cases of Pesticide poisoning (PP) were reported to the Government Analyst in 1954 and since then the reporting of PP has gradually increased and now it has become the most important cause of mortality in the predominantly agricultural districts in Sri Lanka. Despite the fairly well distributed network of Government health institutions, well trained health staff, ready access to a health facil-

(Continued on page 2)

Table 1: Foreign exchange allocatted for import of pesticides - 2000

Item	Volume in metric tons	Value in Rupees [million]
Insecticides	1294.5	431.0
Weedicides	2138.3	710.5
Fungicides	570.9	161.5
Others	124.3	46.4
Total	4128.0	1349.5

Contents ***Page***

(Continued from page 1)

ity free of charge anywhere in the country, PP remains the leading cause of mortality in the government hospitals in the district of Polonnaruwa and Nuwara Eliya. It is the 2nd leading cause of mortality in the districts of Anuradhapura and Hambantota and 6th or 7th in the whole island every year since 1993.

In the year 2003, a total of 19,055 cases were hospitalized due to PP out of which 1310 died. The number of deaths reported for the year 2003 is the lowest since 1996. However the experience in the past few years is the same and on average 19,500 cases and 1,800 deaths have been reported from the Government hospitals annually. This means that one victim is being hospitalized every two hours and 5 are dying every day due to pesticide poisoning in this country.

Many hospital and community based studies have been carried out in Sri Lanka to identify the gravity of the problem but with no organized interventions, the problem remains the same. In almost all studies the researchers have found that the main cause for PP is intentional use in attempting suicide. The problem of accidental and occupational poisoning is there but when compared to the intentional use the magnitude is very much less.

The fact that Sri Lanka is having a high rate of intentional pesticide poisoning is very much compatible with the Sri Lanka's record of high rate of suicides due to any cause. Sometime back Sri Lanka was placed first in the list. With the available latest international data, Lithuania, Estonia, Russia, Latvia and Hungary has the highest suicide rates. Sri Lanka is among the next five countries where Kazakhstan, Belarus, Slovenia and Finland are also included.

Table 2: Agricultural activity and pesticide poisoning in selected districts in Sri Lanka

District	Extent sown Paddy [hectares]	Pesticide Poisoning	
		Incidence [per 100,000 population]	Case Fatality Rate [%]
Ampara	112549	64.2	1.0
Polonnaruwa	90496	305.7	7.1
Kurunegala	67205	205.9	8.4
Batticaloa	62858	121.6	3.0
Anuradhapura	42186	295.5	5.8
Sri Lanka	778544	6.8	7.8

Although Sri Lanka has not been able to do much in the area of pesticide poisoning or for that matter in the area of Non Communicable Diseases, the country has achieved much in the area of Communicable diseases. Sri Lanka is free from polio since 1994 and almost on the verge of eradication. No cases of diphtheria are reported and the Maternal and Neonatal Tetanus has been eliminated. A very few cases of whooping cough cases are being reported and measles rubella and Japanese Encephalitis are under control. Leprosy is near elimination. Malaria is decreasing and a target has been set for eradication of malaria in 2015.

In this context it is interesting to analyze why Sri Lanka has not been able to address this very important public health problem. Ampara district has the most number of hectares under paddy cultivation but the incidence and Case Fatality Rates are low. In contrast Polonnaruwa & Kurunegala have high incidence as well as high CFR. The Anuradhapura district also has a fairly high incidence and higher CFR but lower than that of the above two districts (Table 2). This shows that the free availability is not the only factor which is leading to high incidence of pesticide poisoning and the other factors may also play an important role.

In a hospital based study done in the Kurunegala District in 1990/91 it has been found that a simple quarrel between children and parents and among brothers and sisters in the same family are the cause for many suicidal attempts. Further in the same study it had been revealed that the free availability, indiscriminate use, incorrect storage practices of the remaining pesticides following use, other economic and social issues unrelated to agriculture have led to these high rates of PP.

On the issue of pesticide poisoning, the Ministry of Health is providing care for the patients who are exposed to pesticides. The immediate management of patients is being done at the respective hospitals where

(Continued on page 3)

An international workshop on health effects of pesticides

During 2004, the Epidemiology Unit started collaborating with international agencies to support the prevention and control of this important issue. As a result a short course on health effects of Pesticides was conducted from 5th to 9th September in Colombo. It was sponsored by the Fogarty International Training and Research in Environmental and Occupational Health Programme at the University of Alabama at Birmingham, USA. Out of the 22 participants of this workshop, 11 were from Sri Lanka. Rest were from Pakistan, India and Nepal. Sri Lankan participants represented the fields of epidemiology, occupational & environmental health, clinical medicine, pesticides registry and industry. The teaching panel consisted of both foreign and local experts from the fields of toxicology, occupational medicine, epidemiology and community medicine.

During this workshop, a core group also has been identified to work as a team to strengthen the collaboration with many different organizations and potential stake holders. It was possible to identify intervention strategies for a pilot project to reduce mortality and morbidity due to pesticide poisoning. Soon, this will be implemented in a selected Medical Officer of Health area. Epidemiological Unit will be coordinating this activity.

Table 1: Vaccine-preventable diseases & AFP

03rd - 09th September 2005 (36th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	01 GL=1	01 JF=1	00	00	00	00	02	03	73	77	-05.2%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	00	00	00	00	00	00	00	00	02	37	60	-38.3%
Tetanus	00	00	00	00	00	00	00	01 RP=1	01	00	24	34	-29.4%
Whooping Cough	00	00	00	00	00	00	01 BD=1	01 RP=1	02	01	82	38	+115.8%
Tuberculosis	38	29	43	10	20	16	20	00	176	207	6918	6165	+12.2%

Table 2: Diseases under Special Surveillance

03rd - 09th September 2005 (36th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	97	16	13	01	03	03	00	11	144	140	3632	13281	-72.7%
Encephalitis	00	00	00	00	00	00	00	00	00	02	43	75	-42.7%
Human Rabies	00	00	00	01 TR=1	00	00	00	00	01	01	36	66	-45.5%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

the patients are admitted to. Provision of psychiatric services is yet to be organized to achieve a reasonable coverage. A functional reporting system is also not available at present. On the other hand the agricultural Ministry is taking care of the farmers in preventing accidental and occupational hazards. Though this is more or less a social problem the Social Service department's involvement is also yet to be organized.

Hence it is high time that Sri Lanka needs to bring all stake holders together to act in this very important public health problem to minimize the deaths as well as unnecessary exposures. It will create an environment which would be conducive to take measures against recurrence of the problem.

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The Editor wishes to thank Dr. M. R. N. Abeysinghe, Chief Epidemiologist and Dr. Jagath Amarasekara, coordinator of the course on "health effects of pesticide" for their contribution to this article.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

03rd - 09th September 2005 (36th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	53	1332	10	196	00	00	02	38	03	109	04	73	00	04	02	90	100
Gampaha	36	859	02	187	00	02	00	47	00	51	15	148	00	02	05	92	71
Kalutara	08	198	06	357	00	00	00	36	13	90	02	75	00	00	00	28	60
Kandy	14	288	11	333	00	01	04	86	00	12	00	36	01	63	05	68	73
Matale	00	27	00	245	00	02	00	19	00	10	00	34	00	00	00	10	50
Nuwara Eliya	02	11	02	259	00	00	05	154	00	290	00	09	00	20	00	21	100
Galle	02	50	01	99	00	02	00	10	00	02	07	49	00	08	01	09	75
Hambantota	00	25	07	200	00	00	00	08	00	41	00	39	00	60	00	13	80
Matara	11	81	03	146	00	02	00	21	00	29	08	123	02	111	02	09	79
Jaffna	01	10	02	121	00	01	00	276	00	18	00	01	00	86	03	53	88
Kilinochchi	00	02	03	29	00	00	00	06	00	26	00	00	00	00	00	06	100
Mannar	00	00	00	27	00	00	00	38	00	25	00	00	00	01	00	12	17
Vavuniya	00	23	01	93	00	03	04	179	00	13	00	01	00	00	00	05	75
Mullaitivu	00	00	00	13	00	00	00	14	00	02	00	00	00	03	00	05	100
Batticaloa	00	03	01	29	00	01	01	07	00	03	00	02	00	05	10	237	78
Ampara	00	10	04	67	00	00	00	05	01	09	00	10	00	00	00	17	57
Trincomalee	00	44	05	242	00	00	01	33	00	35	00	06	00	03	03	133	67
Kurunegala	01	79	14	300	00	02	02	58	01	35	00	16	00	10	03	58	100
Puttalam	02	96	01	54	00	02	04	141	00	04	00	16	00	00	00	29	78
Anuradhapura	02	63	06	112	00	02	01	18	00	105	00	70	00	16	01	39	79
Polonnaruwa	01	39	04	36	00	00	00	72	00	01	00	19	00	01	00	18	86
Badulla	00	22	06	428	00	00	03	170	00	13	01	56	04	68	00	140	67
Monaragala	00	10	00	120	00	01	00	31	00	17	00	88	01	71	00	61	40
Ratnapura	09	271	08	482	00	17	04	259	00	17	02	62	00	11	02	56	87
Kegalle	02	85	06	289	00	02	02	26	00	11	04	84	00	24	02	76	70
Kalmunai	00	04	00	42	00	03	00	18	00	01	00	00	00	03	04	167	55
SRI LANKA	144	3632	103	4506	00	43	33	1770	18	969	43	1017	08	570	43	1452	74

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 17th September 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WER SRI LANKA - 2005

Vol. 32 No. 38 **17th – 23rd September 2005**

Influenza Part I : Pathogenesis

Three times in the last century, the influenza A viruses resulted in global pandemics and large tolls in terms of both disease and deaths. The most infamous pandemic was "Spanish Flu" which affected large parts of the world population and is thought to have killed at least 40 million people in 1918-1919. More recently, two other influenza A pandemics occurred in 1957 ("Asian influenza") and 1968 ("Hong Kong influenza") and caused significant morbidity and mortality globally. In contrast to current influenza epidemics, these pandemics were associated with severe outcomes also among healthy younger persons, albeit not on such a dramatic scale as the "Spanish flu" where the death rate was highest among healthy young adults. Most recently, limited outbreaks of a new influenza subtype A (H5N1) directly transmitted from birds to humans have occurred in Hong Kong Special Administrative Region of China in 1997 and 2003. Since 2003, twelve countries have reported poultry outbreaks of avian influenza.

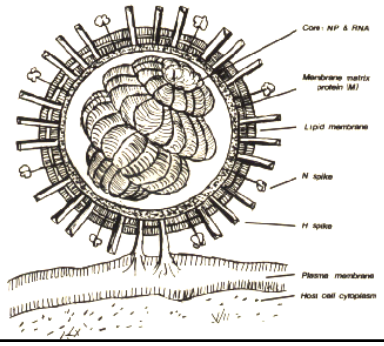
In annual influenza epidemics 5-15% of the population are affected with upper respiratory tract infections. Hospitalization and deaths mainly occur in high-risk groups (elderly, chronically ill). Although difficult to assess, these annual epidemics are thought to result in between three and five million cases of severe illness and between 250 000 and 500 000 deaths every year around the world. Most deaths currently associated with influenza in industrialized countries occur among the elderly over 65 years of age.

Aetiology and Pathogenesis

Influenza virus belongs to the family *Orthomyxoviridae*, which is characterized by a single stranded and segmented RNA genome. The classification of influenza viruses is based on their core proteins and accordingly there are three types namely A, B and C. The subtypes of influenza A viruses are determined by envelope glycoproteins possessing either **Haemoagglutination (HA)** or **Neuraminidases (NA)** activity. High mutation rates and frequent genetic reassortments of these viruses contribute to great variability of the HA and NA antigens. Minor point mutations causing small changes *(antigenic drifts)* enables the virus to evade immune recognition resulting in repeated influenza outbreaks during inter-pandemic years.

Major changes in HA antigens (*antigenic shift)* are caused by reassortments of genetic materials from different A subtypes. These events occurring through reassortment between animals for example in co-infected pigs, and humans are rare. Type B virus does not exhibit antigenic shift and is not divided into sub types.

Figure 1: A graphical presentation of the influenza virus



Influenza A viruses infects a range of mammalian and avian species whereas type B and C infections are largely restricted to humans. Only type A and B cause human diseases of any concern. All of currently identified 16 HA and 9 NA subtypes of influenza A vi-

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(Continued from page 1)

ruses are maintained in wild aquatic bird populations. Humans are generally infected by viruses of the sub types H1 and H2 or H3 and N1 or N2. Animal subtypes of influenza virus need adaptation to mammalian hosts or reassortment with human viruses before they infect humans. When this occurs, fatality rates may be very high. Infamous Avian influenza outbreak in Hong Kong self Administered Region (SAR) in 1997 was a consequence of such an adaptation of the Avian H5N1 virus. Antigenic and genetic changes in H5N1, large poultry outbreaks in Asia and Avian outbreaks caused by sub types such as H9N2, H7N7, H7N3 and H10N7 in birds and occasionally human disease in various parts of the world have drawn the attention of Epidemiologists in the world. Should the avian human mutants or reassortants acquire the capacity to transmit effectively among humans, this could lead to a human cataclysm.

Influenza viruses are transmitted mainly by large droplets and small-particle aerosols originating from the respiratory secretions of infected people. The incubation period ranges from 1-5 days with an average of 2 days. In infants and young children, viral shedding may last into the second week after the onset of illness. Children attending day care and school are the principal transmitters of influenza in the community. Secondary bacterial pneumonia commonly caused by *Streptococcus pneumoniae*, *Haemophilus influenzae*, or *Staphylococcus aureus* is a common complication of pneumonia.

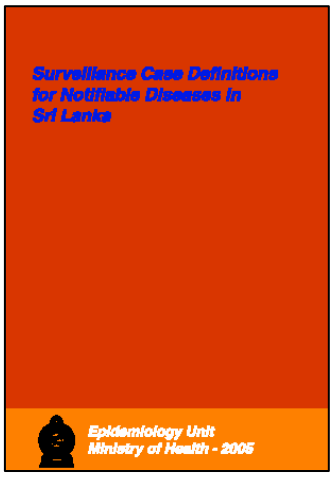
(Continued on page 3)

some key moments in influenza history

- **412 BC**: Major epidemic of influenza recorded by Hippocrates
- **1781**: Major epidemic causing high mortality among the elderly that spread across Russia from Asia
- **1830**: Major epidemic causing high mortality among the elderly that spread across Russia from Asia
- **1889-1890**: Major epidemic
- **1900**: Major epidemic
- **1918-1919**: Pandemic which killed 20-40 million people around the world; also known as the "Spanish influenza"
- **late 1920's**: Richard Shope showed that swine influenza could be transmitted through filtered mucous, implying that influenza is caused by a virus
- **1933**: Sir Christopher Andrewes, Wilson Smith, and Sir Patrick Laidlaw isolated the first human influenza virus
- **1940**: Frank Macfarlane Burnet grows influenza on a laboratory growth system (embryonated chicken eggs)
- **1941**: George K. Hirst discovered that influenza caused hemagglutination of red blood cells, thus providing a new method of assaying for the virus
- **1955**: Sir Christopher Andrewes, along with Burnet and Bang, coins the term "myxovirus" for the influenza family
- **1957**: Major antigenic shift causes the Asian influenza epidemic
- **1968**: Major antigenic shift causes the Hong Kong influenza epidemic
- **1976**: Swine Flu scare
- **1977**: Mild Russian influenza epidemic
- **1988**: Wiley, Wilson, and Skehel determine the location of the antigenic sites on the hemagglutinin molecule by X-ray crystallography

New Publication:

Surveillance Case Definitions for Notifiable Diseases in Sri Lanka (SLMH-EPID-05/01)



Epidemiological surveillance is a major public health strategy in prevention and control of diseases. Surveillance not only gives data on epidemiology and burden of diseases but also guides in monitoring and controlling the disease under surveillance.

Surveillance and notification goes hand in hand. The notification system in Sri Lanka is well established and functioning remarkably well. This has provided the basis for control and prevention of many diseases which had a potential threat to the public health.

The list of notifiable diseases in Sri Lanka has been updated several times. There were several new additions too. Severe Acute Respiratory Syndrome (SARS) was added to the list in 2003. Chickenpox, Meningitis and Mumps were new additions during 2005. These three conditions has to be notified from 1st January 2006.

Over the years, there was a long felt need for standard case definitions which are simple and applicable in Sri Lanka. This new publication of the Epidemiology Unit: "Surveillance Case Definitions for Notifiable Diseases in Sri Lanka" was the end result of a long process taken to fulfil the said need. This document was prepared following a WHO sponsored workshop of experts from all relevant medical disciplines. The document has undergone repeated revival by all relevant specialists. This is a thoroughly peer revived document which has taken scientific and practical aspects into consideration.

The Epidemiology Unit believes that this would be a user friendly document to all medical officers in all parts of the country that will facilitate contributing to sustain and improve the country's surveillance system effectively. The print document has been distributed among all hospitals, Medical Officers of Health and other relevant institutions and personnel. Others can access the publication on the web at: http://www.epid.gov.lk/pdf/Final-Book.pdf

The Epidemiology Unit also welcomes any comments or suggestions on the content and format of this publication.

Table 1: Vaccine-preventable diseases & AFP

10th - 16th September 2005 (37th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	00	00	00	00	00	01	73	78	-06.4%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	00	00	00	00	00	00	00	00	01	37	61	-39.3%
Tetanus	00	01 ML=1	00	00	00	00	00	00	01	01	25	35	-28.6%
Whooping Cough	01 CB=1	00	00	00	00	00	00	00	01	00	87	38	+128.9%
Tuberculosis	131	16	11	29	00	34	00	43	264	107	7182	6272	+14.5%

Table 2: Diseases under Special Surveillance

10th - 16th September 2005 (37th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	78	09	05	00	00	00	03	08	103	134	3763	13445	-72.0%
Encephalitis	00	00	00	00	00	00	00	00	00	01	43	76	-43.4%
Human Rabies	00	00	00	00	00	00	00	00	00	01	36	68	-47.1%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

In the acute phase of illness, influenza virus may be recovered from nasopharyngeal samples by culture or directly by rapid tests. Serological diagnosis requires spaced paired sera. Serum antibodies confer protection against clinical disease while the mucosal Ig A antibodies contribute to resistance against infection. Serum levels of Haemoagglutination inhibiting (HAI) antibodies appear to correlate with protection against infection and illness. Both influenza–specific cytotoxic T lymphocytes and cells providing antibody dependent cell mediated cytotoxicity serve to limit the infection. Influenza antibodies may persist for months or years although, in some high risk groups, a decline of antibody levels may be observed a few months after vaccination. Within a given sub type, the protective effect of antibody induced by one particular strain can be reduced or lost as a consequence of antigenic drift.

Sources:

WHO. H5N1 avian influenza: first steps towards development of a human vaccine. Weekly Epidemiological Record, 19 August 2005. No 33, 2005, 80: 277-278. Available at: http://www.who.int/wer

WHO. Influenza vaccines. Weekly Epidemiological Record, 19 August 2005. No 33, 2005, 80: 279-287.

Available at: http://www.who.int/wer

Orthomyxoviridae: The Flu Family. Available at: *http://www.stanford.edu/group/virus/1999/rahul23/orthomyxoviridae.html*

The part II of this article in the next issue will review available vaccine options for influenza

The WER Editor would like to acknowledge Dr Ranjan Wijesinge for his contribution in preparation of this article.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

10th - 16th September 2005 (37th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	46	1378	07	204	00	00	00	38	00	109	04	77	00	04	02	92	85
Gampaha	26	892	03	193	00	02	00	47	00	51	03	151	00	02	03	95	86
Kalutara	06	211	14	372	00	00	02	39	00	90	00	77	02	02	01	31	80
Kandy	08	301	00	333	00	01	00	88	00	12	01	37	01	64	00	68	86
Matale	01	28	00	248	00	02	01	20	12	22	00	34	00	00	00	10	75
Nuwara Eliya	00	11	01	260	00	00	02	156	00	290	00	09	00	20	00	21	71
Galle	02	56	04	103	00	02	01	11	00	02	05	55	00	08	00	09	75
Hambantota	01	26	06	208	00	00	00	08	00	41	00	40	00	60	00	13	90
Matara	02	83	01	147	00	02	02	24	00	29	02	128	03	114	02	11	64
Jaffna	00	10	00	121	00	01	00	276	00	18	00	01	00	86	04	57	63
Kilinochchi	00	02	00	29	00	00	00	06	00	26	00	00	00	00	00	06	50
Mannar	00	00	00	27	00	00	00	43	00	25	00	00	00	01	00	13	83
Vavuniya	00	23	03	96	00	03	02	181	00	13	00	01	00	00	00	05	100
Mullaitivu	00	00	00	13	00	00	00	14	00	02	00	00	00	03	00	05	100
Batticaloa	00	03	02	31	00	01	00	07	00	03	00	02	00	05	00	237	67
Ampara	00	10	00	70	00	00	00	05	00	09	00	10	00	00	00	19	29
Trincomalee	00	45	01	259	00	00	00	34	00	35	00	06	00	03	01	137	44
Kurunegala	00	79	10	310	00	02	01	59	00	35	00	16	00	10	03	61	88
Puttalam	00	96	03	59	00	02	00	144	00	04	01	17	00	00	00	29	44
Anuradhapura	00	63	01	115	00	02	00	18	00	105	00	71	00	16	00	39	47
Polonnaruwa	00	39	00	36	00	00	00	72	00	01	00	19	00	01	00	18	86
Badulla	02	25	07	438	00	00	01	171	01	14	00	56	04	72	03	144	60
Monaragala	01	11	01	125	00	01	01	37	00	19	00	88	00	75	02	64	80
Ratnapura	04	276	06	489	00	17	00	259	00	17	00	62	00	11	04	61	87
Kegalle	04	91	06	298	00	02	00	26	00	11	01	89	00	26	02	78	80
Kalmunai	00	04	05	47	00	03	00	18	00	01	00	00	00	03	15	183	73
SRI LANKA	103	3763	81	4631	00	43	13	1801	13	984	17	1046	10	586	42	1506	73

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 24th September 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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Comments and contributions for publication in the WER Sri Lanka are welcome. However, the editor reserves the right to accept or reject items for publication. All correspondence should be mailed to The Editor, WER Sri Lanka, Epidemiological Unit, P.O. Box 1567, Colombo or sent by E-mail chepid@sltnet.lk

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SRI LANKA - 2005
WER

Vol. 32 No. 39 24th - 30th September 2005

Influenza Part II: A review of available vaccine options

The first part of this article was about the pathogenesis of the influenza virus. The best preventive method available against influenza epidemic is immunization.

Influenza vaccines

Currently, both inactivated and live vaccines are used for protection against influenza.

Trivalent inactivated influenza vaccine (TIV)

Whole virus vaccines, split vaccines and sub unit vaccines are the three types of vaccines that are used currently. In many countries, whole virus vaccine has been replaced by less reactogenic split and subunit viruses. In split vaccines, the virus has been disrupted by a detergent while in subunit vaccines HA and NA antigens have been purified by removal of other viral components. In order to increase the immunogenicity, some current formulations include adjuvants such as immune stimulating complexes, M 59 adjuvant or virosomes. Most multi-dose vials of TIV contain the preservative Thimerosal while the vaccines without which is very costly.

Administration of the inactivated influenza vaccine

To children aged between 6-12 months, the vaccine is administered to the antero-lateral aspect of the thigh. The site for vaccination for those who are above 1 year is the deltoid muscle. Those aged 6-36 months should receive the half of the dose of the adult vaccine. Previously unvaccinated children aged < 9 years should receive 2 injections administered at least 1 month apart. A single dose of the vaccine is appropriate for schoolchildren aged >9 years and healthy adults. Inactivated influenza vaccines will not interfere with concomitantly administered DPT or other childhood vaccines.

Efficacy of vaccine

The figures vary considerably according to the exactness of the antigenic match, age, health status of the vaccine recipients, choice of clinical end point criteria and the accuracy of the diagnosis. The vaccine will prevent laboratory confirmed illness in 70-90% of healthy adults provided there is a good antigenic match.

Among elderly persons not living in nursing homes, vaccine may reduce the number of hospitalization by 25-39% and overall mortality by 39-75% during influenza seasons. Among nursing home residents, influenza vaccination can reduce hospitalizations (all causes) by about 50%, the risk of pneumonia by about 60% and the risk of death (all causes) about 68%. Inactivated vaccine shows high efficacy in children > 6 years of age but are poorly protective in children aged < 2 years. A protective efficacy up to 30% against influenza associated acute otitis media in young children has been demonstrated. The average duration of protection is estimated to be 4-6 months. The use of influenza vaccine is cost effective in adults as well as children.

Safety of vaccine

Though the vaccine is generally safe, it differs in terms of reactogenicity. With the whole vaccine, 15-20% recipients, most commonly young children, experience local reactions lasting for 1-2 days. Transient systemic reactions such as fever, malaise and myalgia occur in a minority of vaccine recipients within 6-12 hours of vaccination. Split virus vaccines and sub unit vaccines show reduced systemic reactogenicity in both children and adults.

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(Continued from page 1)

During some influenza seasons, TIV have been associated with a slight increase in the risk of Guillan Barre syndrome in older adults. A sporadic, self limiting oculo- respiratory syndrome has been reported following the use of a particular vaccine product in Canada. There are no contra indications to the use of vaccine in age groups > 6 months other than anaphylactic allergic reactions to eggs or other components of the vaccine.

Live attenuated influenza vaccine (LAIV)

Live attenuated influenza vaccine has been successfully used in the Russian Federation for a considerable period. The current Russian vaccine is based on cold adapted variants of an H2N2 strain which is reassorted with epidemic H1N1 and H3N3 strains combined with a cold adapted reassortant influenza B virus. The temperature sensitive vaccine will replicate well in the relatively cool environment of the nasopharynx but poorly in the lower respiratory tract. LAIV is safe and efficacious following a single dose in adults and children >3 years of age.

A similar vaccine based on genetic reassortment technologies is used in the USA. This Cold Adapted Influenza Vaccine (CAIV-T) contains HA and NA genes from the 3 WHO recommended strains as well as genes from a cold adapted master strain. This vaccine does not contain Thimerosal.

In terms of protective efficacy, live influenza vaccines appear to be comparable with the TIVs. Due to reported increase incidence in reactive airway disease in vaccine recipients <5 years of age and inadequately documented protective efficacy in older people, CAIV-T is licensed only for healthy people aged 5-49 years. A reduction of influenza associated febrile otitis media and lower respiratory complications during influenza season have been reported in vaccine recipients. Community based immunization of school children appears to reduce the risk of medically attended influenza illness in adults.

Following nasal administration, children shed the CAIV-T strain for an average duration of 7-8 days (range 1-21 days). Transmission of the vaccine virus to exposed non immune people appears to be very rare. However, as a precaution, the vaccine should not be given to highly immune suppressed individuals or their contacts. This vaccine is marketed only in the USA.

Contraindications to CAIV-T

- Anaphylactic reactions to eggs
- A history of Guillan Barre syndrome
- Patients aged <18 years on long term Aspirin therapy
- First trimester pregnancy
- various states of immunosuppresion

WHO position on influenza vaccine

The objective of seasonal vaccination is to avoid severe cases of influenza and its complications. In industrialized countries, the vaccine is offered to nationally defined high risk groups. Based on the data from industrialized countries, in order of priority, the following groups of individuals may be targeted for vaccination.

1. Residents of long term care facilities for elderly people and the disabled.

2. Elderly non-institutionalized individuals with chronic conditions such as pulmonary and cardio vascular illness, metabolic diseases including Diabetes mellitus and renal dysfunction, immunosuppressant conditions including HIV and transplant recipients.

3. All adults and children aged >6 months with any of the conditions mentioned above.

4. Elderly individuals who are above nationally defined age limit irrespective of other risk factors. Though this age limit may be considerably lower in countries with poor living conditions, in most countries, age limit has been defined to be ≥65 years.

Other groups defined on the basis of national data and capacities such as contacts of high risk people, pregnant women, health care workers and others with key functions in society as well as children 6-23 months of age.

Influenza vaccination in pregnancy is safe and is recommended for all pregnant women during the influenza season. This recommendation is motivated by the potential severe course of influenza during pregnancy and also in order to protect infants against influenza during their vulnerable first months of life.

Conclusion

Influenza may be a larger public health problem in poor societies than realized so far considering the presence of predisposing factors such as malnutrition and poor conditions of living. At the global level, no country has fully implemented influenza vaccine recommendations. Even in the wealthier states, a significant proportion of the groups at risk of complications from influenza are not vaccinated. The WHO recognizes the need of raising public consciousness of influenza, complications as well as beneficial effects of influenza vaccination.

There is a considerable mortality due to influenza among school children and the severe clinical course of influenza in the youngest age groups. Children are crucial in the transmission of the infection. Japanese, Russian and American experiences have demonstrated the significant effects of herd immunity among non immunized segment of population following immunization of children. Therefore, further exploration of the safety and cost effectiveness of introducing influenza vaccination into National Immunization Programmes is clearly warranted.

Efficacious and safe TIV is the cornerstone of influenza vaccination. LAIV appear to be safe and efficacious and may possi-

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

17th - 23rd September 2005 (38th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 KL=1	00	00	00	00	00	00	00	01	00	74	78	-05.1%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	00	00	00	00	00	00	00	00	02	37	63	-41.3%
Tetanus	00	00	00	01 TR=1	00	00	00	00	01	00	26	36	-27.8%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	88	34	+158.8%
Tuberculosis	234	14	03	06	00	00	15	00	272	356	7454	6628	+12.5%

Table 2: Diseases under Special Surveillance

17th - 23rd September 2005 (38th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	32	16	08	00	02	02	01	15	76	117	3851	13620	-71.7%
Encephalitis	00	00	02 GL=2	00	00	00	00	00	02	01	45	78	-42.3%
Human Rabies	00	00	00	00	00	00	00	00	00	05	36	74	-51.4%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

bly induce a broader and long lasting protection than that of inactivated vaccines. Nasal administration is practically advantageous as it enables large scale use of the vaccine among young children. New horizons in the vaccine development are improvement of adjuvants, cell culture based influenza vaccine, sparing vaccine through intra dermal inoculation and use of reverse genetics technology.

The WHO promotes the implementation of epidemiological surveillance, assessment of disease burden, where infrastructure is available, demonstration projects for the estimation of impact of vaccination on disease in lower income countries. Surveillance is important in rural areas where potential animal hosts and humans live in close proximity since it is in such areas that new viral recombinants are likely to originate. WHO global influenza programmes makes recommendations on the composition of the vaccine for the next influenza season. Though the number of manufacturers is small, the current production of the vaccine is adequate for the seasonal demand. However, manufacturing capacity remains a serious concern in the perspective of a new influenza pandemic.

Sources :

Flunet. Global Influenza Programme. Available at: http://gamapserver.who.int/GlobalAtlas/home.asp

WHO. H5N1 avian influenza: first steps towards development of a human vaccine. Weekly Epidemiological Record, 19 August 2005. No 33, 2005, 80: 277-278. Available at: http://www.who.int/wer

WHO. Influenza vaccines. Weekly Epidemiological Record, 19 August 2005. No 33, 2005, 80: 279-287. Available at: http://www.who.int/wer

The WER Editor wishes to thank Dr Ranjan Wijesinghe for his contribution in preparation of this article.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

17th - 23rd September 2005 (38th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	17	1401	03	207	00	00	00	38	00	109	02	79	00	04	00	92	54
Gampaha	14	906	00	193	00	02	00	47	00	51	07	158	00	02	04	99	43
Kalutara	01	213	01	375	00	00	00	39	00	90	03	81	00	02	00	31	20
Kandy	14	315	06	339	00	01	03	91	00	12	01	38	01	65	01	69	59
Matale	02	31	02	252	00	02	00	20	00	22	00	34	00	00	00	10	50
Nuwara Eliya	00	11	00	260	00	00	03	160	00	290	00	09	00	20	00	21	57
Galle	03	59	04	107	02	04	00	11	00	02	06	61	00	08	00	09	63
Hambantota	01	27	08	219	00	00	00	08	00	41	00	40	00	60	00	13	70
Matara	04	87	05	153	00	02	01	25	01	30	03	131	02	116	00	11	57
Jaffna	00	10	00	122	00	01	00	276	00	18	00	01	00	86	00	58	00
Kilinochchi	00	02	00	30	00	00	00	07	00	26	00	00	00	00	00	06	00
Mannar	00	00	00	27	00	00	00	43	00	25	00	00	00	01	00	13	17
Vavuniya	00	23	00	96	00	03	00	181	00	13	00	01	00	00	00	05	00
Mullaitivu	00	00	00	13	00	00	00	14	00	02	00	00	00	03	00	05	00
Batticaloa	00	03	00	31	00	01	00	07	00	03	00	02	00	05	01	238	56
Ampara	00	10	00	74	00	00	00	05	00	09	00	10	00	00	00	19	14
Trincomalee	00	45	01	262	00	00	00	34	03	38	00	06	00	03	01	138	33
Kurunegala	01	80	00	310	00	02	00	59	00	35	00	16	00	10	00	61	29
Puttalam	01	97	00	61	00	02	05	149	00	04	00	17	00	00	00	29	22
Anuradhapura	01	64	00	116	00	02	00	18	00	105	00	72	00	16	00	39	26
Polonnaruwa	01	41	04	40	00	00	00	73	00	01	00	19	00	01	00	18	57
Badulla	01	28	11	454	00	00	00	171	00	14	02	58	03	77	03	148	80
Monaragala	00	11	04	129	00	01	00	37	00	19	00	88	02	77	00	64	80
Ratnapura	12	289	09	498	00	17	00	260	02	19	03	65	00	11	01	62	73
Kegalle	03	94	00	298	00	02	01	27	00	11	01	90	02	28	00	78	30
Kalmunai	00	04	01	48	00	03	00	18	00	01	00	00	00	03	00	183	27
SRI LANKA	76	3851	59	4714	02	45	13	1818	06	990	28	1076	10	598	11	1519	45

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 01st October 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WER SRI LANKA - 2005

Vol. 32 No. 40 **01st - 07th October 2005**

Investigation of the mystery of outbreak of meningitis:

More questions than answers

Background

On the 25th of Monday, July, 2005, the Epidemiology unit was informed by a Consultant Community Physician at the Family Health Bureau that there were four patients with symptoms suggestive of meningitis after having undergone caesarean sections at the De Soyza Maternity Hospital (DMH). They had been under investigation for a period of nearly two weeks at the hospital. On the very same day, the Epidemiology Unit undertook the collection of data on patients from the DMH and the National Hospital (NHSL) as some were already under the care of neurologists. Special meetings were held on 28th July, 2005 at the NHSL and DMH. The multi disciplinary specialists from the DMH and NHSL attended the meeting. The Director General of Health Services also summoned a meeting on the same evening and appointed a committee to investigate the outbreak. On 2nd August, the first death of the patients occurred. By the end of August, there had been eight confirmed patients with three deaths. Of the three deaths, two were from the DMH while one was from the Castle Street Hospital for Women (CSHW).

The very first issue that the investigators had to sort out was deciding whether this was an outbreak. The validity of such an assumption was justified on the ground of four reasons. The cluster of cases was presented with similar clinical presentations. Cases were clustered within a short period of time and clustering was confined to a few institutions. All cases except the last two had been exposed to lumbar puncture (LP) or intrathecal administration of drugs. Since the exposure to an invasive procedure was common to all cases, it was reasonable for the investigators to suspect that the causative agent would have been transmitted through this route. There could have been many sources of the infection and cautious approach to elicit the exact source was of utmost importance. Any conclusion which was not evidence based would have disrupted the normal function of the entire health service in the country. Guess of the source without scientific evidence would have caused unfounded panic among the masses. Therefore, the next task of the investigators was to think of all possible sources of infection. The possibilities were the devices that were used for LP, solutions that were administered intrathecally, the persons who performed the procedure and the environment in which the procedures were performed.

The investigators listed all possibilities under each category. Among the products used for the intrathecal procedures, syringes, needles, anaesthetic solutions and dressings could have been contaminated. Environment of the operation theatre could have been contaminated as well. However, this was thought to be most unlikely as the case patients did not share a common health facility, operating theatre or surgery session. But investigators did not rule out this possibility. On the other hand, the contamination through the persons performing the invasive procedure were also excluded as different anaesthetists, nursing officers had been involved in the cases. Thus, the investigators were able to limit their focus mainly to products that were

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used for the procedure keeping the other possibilities in mind.

However, the investigators had to face another dilemma. Since the initial cases were clustered at the DMH and if it were to be considered that the other few cases were coincidental and included due to the case ascertain bias, one would have thought that the outbreak was at the DMH. Then, again the investigators' thoughts would have streamlined to contaminated devices, anaesthetic practice or the unsatisfactory sterility at the operation theatre as reported by the Bacteriologist.

Thus, the investigators possessed two possible working hypotheses to work on: An outbreak of meningitis as a result of contaminated devices that were used for the intrathecal procedures or an outbreak confined to the DMH where the possible source of infection would have been anything from anaesthetic procedures including items used for the procedure to unsatisfactory working environment.

Meanwhile the investigation took a new turn following the report of the pathologist of the NHSL subsequently confirmed by the mycologist of the Medical Research Institute (MRI) and the Centres for Diseases Control. According to these reports, the specimen of the brain of the deceased contained *Aspergillus fumigatus* species. This was compatible with the same species found in syringes that were tested by the local laboratories. With these new events, focus was entirely shifted to the syringes. Syringes were tested from several places and ironically some of these belonging to different commercial products, from different places were yielding positive results for bacteria and fungus. The investigation continues without an end but with narrow focus on syringes and needles to date.

One limitation of the investigation was that the suspected materials of exposure (e.g. remnants of multi dose vials of anaesthetic solutions etc.) were not available for the investigation. This deprived the investigators of vital clues. Incomplete maintenance of records related to distribution of medical consumables too has affected the efficiency of investigation.

Questions to be answered

The scientific investigation process to solve this mysterious event and identifying the source of infection has posed several questions than answers.

What contradicts the role of contaminated syringes is the clustering of cases in the Colombo group of hospitals in contrast to non-reporting of cases of meningitis following intrathecal procedures from the rest of the country. This occurs against a background of daily performance of large numbers of such invasive procedures. This persuades the epidemiologists to analyse why there are no cases in other part of the country if the syringes are contaminated.

Syringes have been investigated at four different laboratories. There were several instances where syringes from the same sample have been reported positive for fungus by one laboratory while another laboratory has reported it negative. The investigators dilemma is which version is correct to move ahead with further investigations. The manufacturers of the syringes were diverse. Local distributors also vary. But these varying types of syringes are reported positive. Is this due to the lack of adherence to Good Pharmacy Practices (GPP) in storage at the stores? If so, how come the samples from the emergency shipment of the syringes were also reported to be contaminated with bacteria? Can a violation of GPP in terms of storage be possible at the stores of several local distributors? Is the possibility of contamination of several brands practically possible at manufacture?

Over the years, the Medical Supplies Division procured drugs, devices and equipment to the hospitals. This took an unprecedented turn with the Boxing Day Tsunami that devastated the country. All different types of medical relief from various countries were collected and stored at some stores without proper documentation. Their outward movement also had been ad hoc. Investigations have revealed that these items have been distributed to the DMH. The observations of the Epidemiology Unit and the WHO team pointed out the poor compliance with GPP in relation to storage of Tsunami relief items. Subsequently, the logical question that arises is the possibility of the role of the Tsunami donations in this outbreak. Can it be possible that the Tsunami donations had a role in the outbreak? Unfortunately, due to the ad hoc distribution of Tsunami relief items to hospitals, eliciting the real relationship has been made complex. There are definite evidences to show that certain items of tsunami relief donations had been used at the DMH theatre. But, all these trails were closed as remnants were available neither at the theatre nor the stores of Tsunami relief.

The most possible explanation from the epidemiological point of view

The Epidemiologists who were involved in the investigation hypothesised that the real outbreak occurred at the DMH and that was the prime reason why cases clustered at this very hospital. It was obvious that there was a case at the CSHW which had similar clinical manifestations. What would have been the course of action had there been only this death at the CSHW? It would have been considered as a single maternal death with subsequent routinely taken follow up actions. Then, there would not have been investigations of this intensity to search the cause for the meningitis. All this hype was built up simply as a result of the clustering of cases at the DMH.

Now on the basis of this argument, the most possible hypothesis of the outbreak can be constructed. According to this, a product or more than one product which was used for intrathecal procedure at the DMH had been contaminated. The

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

24th - 30th September 2005 (39th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 KL=1	00	01 MT=1	00	00	00	00	00	02	00	76	78	-02.6%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	00	00	00	00	00	00	00	00	01	40	65	-38.5%
Tetanus	00	00	00	00	00	00	00	00	01	00	26	36	-27.8%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	91	35	+160.0%
Tuberculosis	19	29	08	37	19	00	00	23	135	252	7589	6880	+10.3%

Table 2: Diseases under Special Surveillance

24th - 30th September 2005 (39th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	44	16	02	00	02	00	00	02	66	81	3964	13722	-71.1%
Encephalitis	00	00	00	00	00	00	00	00	00	00	45	80	-43.8%
Human Rabies	00	00	00	00	00	00	00	00	00	01	37	75	-50.7%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

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level of the contamination would have been any place from manufacture to the stores at any place including the Tsunami relief store. The use of this contaminated product for intrathecal procedure was the real culprit that caused the outbreak and lethal outcome to a few pregnant mothers who under went caesarean sections under spinal anaesthesia. The immunological status of these women would also have contributed to the outcome as *Aspergillus fumigatus* usually affect immuno-compromised patients. The alternative possibility of the contamination of multi dose vials of anaesthetic solutions that were used at the DMH cannot be ruled out. Confirmation of the role of anaesthetic solutions was impossible as remnants were not available for the purpose of investigation. But, the real predicament for the team of investigators is relating the case at the CSHW to the cluster in the DMH. The investigators still have no answer to this.

Conclusion

The objective of any investigation is to identify the source of infection with a view to issuing practical suggestions for the containment of the current and future outbreaks. However, in this endeavour, all precautionary measures are still covering all possibilities rather than hitting the bull's eye. Vanished trails have made the task complex. This complexity has presented enormous difficulties in smooth functioning of the health activities such as immunisations, intra venous procedures etc. At present, there are no other alternatives than adhering to best practices and keeping the eyes open to find any clue to reveal the cause of this mysterious event.

Compiled by Dr Ranjan Wijesinghe. Special thanks to Dr. .M. R. N. Abeysinghe, Chief Epidemiologist and Dr. Ananda Amarasinghe., Assistant Epidemigist.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

24th - 30th October 2005 (39th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	25	1433	03	211	00	00	02	40	01	110	05	87	00	04	00	92	54
Gampaha	18	929	04	198	00	02	00	47	00	51	04	163	00	02	01	100	57
Kalutara	01	218	01	381	00	00	00	39	00	90	02	84	00	02	00	32	60
Kandy	14	348	04	344	00	01	01	92	00	12	01	39	01	65	05	75	68
Matale	02	33	01	258	00	02	00	20	00	22	00	34	00	00	00	10	58
Nuwara Eliya	00	12	02	264	00	00	02	163	00	290	00	09	00	20	01	22	71
Galle	01	60	01	110	00	04	00	11	00	02	01	63	00	08	00	09	75
Hambantota	01	29	03	226	00	00	00	08	00	41	00	40	01	61	00	13	80
Matara	00	91	01	154	00	02	01	26	00	30	00	131	00	117	00	11	50
Jaffna	00	10	00	122	00	01	00	276	00	18	00	01	00	86	02	60	63
Kilinochchi	00	02	01	31	00	00	00	07	00	27	00	00	00	00	00	06	25
Mannar	00	00	00	27	00	00	00	43	00	25	00	00	00	01	00	13	00
Vavuniya	00	23	00	96	00	03	00	181	00	13	00	01	00	00	00	05	00
Mullaitivu	00	00	01	14	00	00	03	17	00	02	00	00	00	03	02	07	100
Batticaloa	00	03	00	31	00	01	00	07	00	03	00	02	00	05	01	239	33
Ampara	00	10	00	80	00	00	00	05	00	09	00	10	00	00	00	21	29
Trincomalee	00	45	04	277	00	00	00	35	00	38	00	06	00	03	01	141	33
Kurunegala	01	82	07	320	00	02	00	60	00	35	00	16	00	11	00	61	53
Puttalam	01	99	00	62	00	02	00	150	00	04	00	19	00	00	00	29	56
Anuradhapura	00	64	00	119	00	02	00	19	00	105	00	72	00	16	00	39	37
Polonnaruwa	00	42	00	41	00	00	01	75	00	01	00	19	00	01	00	18	86
Badulla	00	28	10	469	00	00	02	173	00	14	02	60	02	79	00	148	60
Monaragala	00	11	06	135	00	01	01	39	00	19	00	88	02	79	02	66	70
Ratnapura	02	291	05	505	00	17	02	262	00	19	00	68	00	11	02	65	40
Kegalle	00	97	00	299	00	02	00	28	00	11	01	93	00	28	00	79	20
Kalmunai	00	04	06	54	00	03	00	18	00	01	00	00	00	03	06	189	18
SRI LANKA	66	3964	60	4828	00	45	15	1841	01	992	16	1105	06	605	23	1550	51

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 08th October 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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ON STATE SERVICE

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WER SRI LANKA - 2005

National medicinal drug policy

Attempts to formulate a drug policy in Sri Lanka date back to 1960s. Sri Lanka had a partly written drug policy which was written as elements of a policy beginning from selection of drugs for the government drug supply, the Ceylon Hospital Formulary in early 1960s, the Bibile Wickremasinghe report in 1971 and the Cosmetic Devices and Drug Act (1980). However, there was a lack of comprehensiveness in these documents. Though there were attempts to develop a National Medicinal Drugs Policy (NMDP) in 1991 and 1996, they did not reach the stage of approval by the Cabinet.

On the foundation of previous efforts, a comprehensive, new policy document on Medicinal Drugs has been prepared in collaboration with the WHO and participation of all stakeholders. The foundation of the document was laid on the basic concepts of National Medicinal Drugs Policy suggested by the late Professor Senaka Bibile and the discussions with all stake holders. The stakeholders comprised of the Government Medical Officers Association, Independent Medical Practitioners Association, Sri Lanka Medical Association, University academics, pharmacists, representatives from the patient right movements and pharmaceutical industry.

This policy document was presented to the Minister of Health recently. The consultative meeting for the preparation of the NMDP was held with the participation of all stake holders in relation to medicinal drugs. The first draft prepared after the initial meeting was presented for public comments. The comments made by the public were discussed at length before preparation of the final document. The new policy includes many progressive features that enable the provision of high quality medicinal drugs for affordable prices to the people of our country.

The stated objectives of the Sri Lankan Medicinal Drug Policy are as follows:

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A tribute to a visionary

The 28th death anniversary of the Professor Senake Bibile was marked recently. Professor Senake Bibile was the pioneer in introducing the basic concepts of a National Medicinal Drug Policy to Sri Lanka. His concept of Essential Medicines which is accepted worldwide is considered to be a key initiative in the provision of affordable and quality drugs to the world population. He was well ahead of his time. His work on pharmaceuticals started in early 1950's reached to its climax in 1971, when the Bibile Wikramasinghe report introduced the first scientific medicinal drug policy in Sri Lanka. This became a role model to many developing nations.

Importance of his vision is felt more today than in yesteryears. The WER team wishes to pay tribute to this great visionary. The best tribute that the country can pay to this great son of Sri Lanka is to implement the Medicinal Drugs Policy that will enable the provision of high quality medicinal drugs for affordable prices to the people of our country.

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1. To ensure the availability and affordability of efficacious, safe and good quality medicine relevant to health care needs of the people in a sustainable and equitable manner

2. To promote the rational use of medicines by healthcare professionals and consumers

3. To promote local manufacture of essential drugs

The policy advocates a National Standing Committee appointed by the Minister on the recommendation of Director General of Health Services, comprising all stakeholders to oversee the implementation of National Medicinal Drug Policy.

The policy is based on the essential drugs concept and recommends the selection of drugs on valid scientific evidence, the disease patterns in the country and cost effectiveness. This provides the opportunity to limit unnecessary drugs entering the local pharmaceutical market. It will also protect consumers from drugs with questionable indications and usage.

A new pricing policy is recommended to ensure affordability of drugs. At present no pricing policy is in force in Sri Lanka for medicinal drugs. The existed pricing policy was abolished in September 2003. Previous policy was based on the CIF (cost, insurance and freight). CIF price was used as the base and percentage was added at each level of trade (importers, wholesale, retail). Therefore, the retailer had the opportunity of obtaining a higher profit by selling brand name with a high CIF price than a low cost drug of the same generic entity. In order to curtail this window for exploitation, the new policy proposed that the retail pricing should be based on a dispensing fee rather than cost plus markup. The dispensing fees for each category of drugs will be decided by the Technical Advisory Committee.

It also recommends legalization of generic prescribing and allowing cost effective generic substitution with the consent of the patient. When the prescriber has written an expensive brand name in the prescription, the patient will get the opportunity to ask for a product that costs him a lesser amount. The pharmacist is compelled and possesses the legal right to substitute an expensive product with a less costly one. Furthermore, the prescriber is barred from demanding a particular brand to be dispensed by using "Do not substitute" in the prescription. This allows provisions to protect the consumer from exorbitant prices of some branded products.

National Medicinal Drug Policy

- Is within the overall health policy of Sri Lanka
- Based on the essential medicines concept
- Main focus is on health sector
- Coordinates with education, finance, agriculture, animal husbandry, pharmaceutical trade and industry
- Safeguards the consumer/patient rights

Elements of NMDP

- ☑ Selection of essential medicines
- ☑ Affordability and equitable access
- ☑ Financing options
- ☑ Supply systems
- ☑ Regulation and quality assurance
- ☑ Quality use of medicine
- ☑ Research
- ☑ Human Resources
- ☑ Viable Local Pharmaceutical Industry
- ☑ Monitoring and Evaluation

NMDP endorses that public health provision of Doha declaration (Parallel imports and compulsory licensing) should be incorporated into the national legislation to ensure affordability of needed medicines. A compulsory license in medicine is an authorization from the Government permitting the import of generic medicines, or the local manufacture of the generic version of a patented medicine without the patent holders consent. Parallel importing can be used to tackle high prices, if that medicine is available at a cheaper price in another country. If patented medicine is expensive but is sold cheaper in another country, third parties can import that medicine without the consent of the manufacturer to be sold at a cheaper price.

The new policy recommends that the State should continue centralized bulk purchase and supply to its institutes. Centralized bulk purchase in Sri Lanka was started in 1972 after the establishment of the State Pharmaceutical Cooperation by late Prof. Senake Bibile. As large quantities of a particular drug that is needed by the state institutions for a year is purchased through world wide tenders, the unit price is reduced to a minimum. This saves colossal sums of foreign exchange to the country that can be utilized for other essential items such as food. The new policy further advocates that preference should be given to local manufactures when procuring drugs for the state sector. This will further reduce the burden on the annual budget of drugs.

NMDP proposes to establish a statutory body called the National Medicinal Drug Regulatory Authority accountable to the Minister of Health through the National Standing Committee. This authority will be solely responsible for regulation and control of manufacture, importation, registration, promotion, sale and distribution of medicinal drugs, devices nutraceuticals and functional foods. The new authority will have financial independence than the current authority thereby acquiring the ability to perform more efficiently. It will have the authority to limit the number of new chemical entities of a particular class of drugs as well as the number of the products of a particular chemical entity. These provisions provide a better regulation of the pharmaceutical market,

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

01st - 07th September 2005 (40th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	00	01 AP=1	00	00	01	00	77	78	-01.3%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	00	00	00	00	00	00	00	00	00	40	65	-38.5%
Tetanus	00	00	00	00	00	00	00	00	00	00	26	37	-29.7%
Whooping Cough	01 KL=1	00	01 HB=1	00	01 KR=1	00	00	00	03	00	95	36	+163.9%
Tuberculosis	78	37	19	40	00	00	00	29	203	49	7792	6929	+12.5

Table 2: Diseases under Special Surveillance

01st - 07th September 2005 (40th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	63	12	05	00	03	03	01	10	97	80	4124	13853	-70.2%
Encephalitis	00	00	00	00	00	00	00	00	00	00	46	80	-42.5%
Human Rabies	00	00	00	00	00	00	01 BD=1	00	01	01	40	76	-47.4%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.; **NA**= Not Available

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

quality assurance of the drugs and less confusion among prescribers, pharmacist and the consumers in the country.

The policy further recommends providing facilities to develop the local pharmaceutical manufacturing industry by providing incentives. The policy identifies that the state should continue to strengthen its stake in the pharmaceutical market in the country through State Pharmaceutical Corporation (SPC) and State Pharmaceutical Manufacturing Corporation (SPMC). It further recommends the amalgamation of these two corporations under a common administration in order to streamline the provision of quality drugs to the nation. The SPC should be the sole importer and distributor of pharmaceuticals to the state sector. It should also expand its services in the retail market through Osu Sala outlets. The SPMC will function as the manufacturing wing of the SPC.

Recently concluded meeting of the health ministers of the South East Asia Region (SEAR) has also endorsed the importance of a medicinal policy that concentrates on and facilitates the public health in member countries. Therefore, it is high time for the new policy to be enacted in order to provide a service to the nation in respect of medicinal drugs.

Compiled by Dr. M. C. Weerasinghe, Department of Community Medicine, Faculty of Medicine, University of Colombo.

Dr M. C. Weerasinghe delivered the Professor Senaka Bibile Memorial Lecture on 29th September 2005 at the Auditorium of the Public Library, Colombo.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

01st - 07th October 2005 (40th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	39	1491	05	220	00	00	02	44	00	110	09	97	00	04	02	95	54
Gampaha	18	972	06	211	00	02	01	49	00	57	05	182	00	02	06	111	71
Kalutara	06	228	01	388	00	00	00	39	00	90	01	85	00	02	00	32	40
Kandy	09	361	03	351	00	01	04	96	00	12	03	42	00	65	02	77	77
Matale	02	35	03	269	00	02	01	23	00	22	00	34	00	00	00	10	67
Nuwara Eliya	01	13	00	265	00	00	01	166	00	290	00	09	00	20	00	22	57
Galle	02	63	09	119	00	04	01	12	15	17	04	70	00	08	00	09	81
Hambantota	00	29	08	234	00	00	00	08	00	41	00	40	01	63	02	15	90
Matara	03	95	04	159	00	02	01	29	00	30	01	135	01	118	00	11	79
Jaffna	00	10	09	134	00	01	01	277	00	18	00	01	00	86	04	65	25
Kilinochchi	00	02	00	31	00	00	00	07	00	27	00	00	00	00	00	06	00
Mannar	00	00	01	28	00	00	05	48	00	25	00	00	00	01	00	14	67
Vavuniya	00	23	03	104	00	03	04	189	00	19	00	01	00	00	00	06	75
Mullaitivu	00	00	00	14	00	00	00	19	00	02	00	00	00	03	00	07	00
Batticaloa	00	03	00	34	00	02	00	07	00	03	00	02	00	05	01	251	22
Ampara	00	10	01	86	00	00	00	05	00	09	00	11	00	00	00	25	29
Trincomalee	00	45	05	284	00	00	00	35	00	38	00	06	00	03	02	143	44
Kurunegala	01	84	03	328	00	02	00	61	00	35	00	16	00	11	01	62	82
Puttalam	02	101	01	66	00	02	01	152	00	04	00	20	00	00	04	33	44
Anuradhapura	02	67	07	130	00	02	02	21	00	105	01	74	00	16	01	41	42
Polonnaruwa	01	43	04	45	00	00	00	75	00	01	00	19	00	01	00	18	86
Badulla	01	29	32	506	00	00	01	174	07	21	01	62	04	83	00	149	80
Monaragala	00	11	00	139	00	01	00	42	00	19	00	88	02	83	03	72	70
Ratnapura	08	304	07	514	00	17	01	265	00	19	00	69	00	11	01	67	53
Kegalle	02	101	06	314	00	02	00	29	00	11	01	96	02	33	03	82	70
Kalmunai	00	04	05	65	00	03	00	20	00	01	00	00	00	03	00	195	27
SRI LANKA	97	4124	123	5038	00	46	26	1892	22	1026	26	1159	10	621	32	1618	61

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 15th October 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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ON STATE SERVICE

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WEEKLY EPIDEMIOLOGICAL REPORT

A publication of the Epidemiological Unit,

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Vol. 32 No. 42 **15th - 21st October 2005**

SRI LANKA - 2005

WER

Financial sustainability for EPI

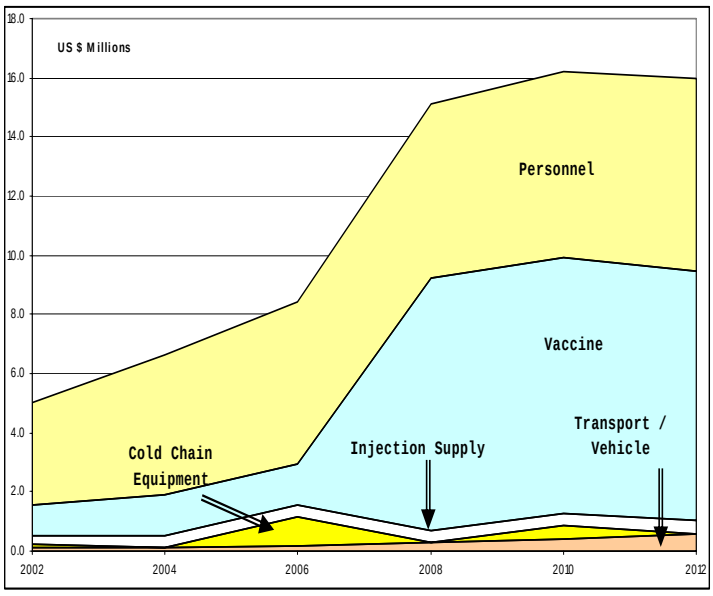
During the recent past, Sri Lanka showed a mixed outcome in economic status. This has created a disproportionate increase in both - the total government expenditure and revenue but widening the gap between. Although the budgetary allocation for health has increased gradually over the years, there is the theoretical risk of an adverse implication on the health care delivery system. To ensure an uninterrupted immunization service is the responsibility of programme managers. While further improving the quality of service, taking measures to reduce the cost and wastage is of prime importance in this exercise.

The main source of the government's health expenditure is the Consolidated Fund of the Government and the balance comes as foreign aid. Since more than 90% of the immunization cost is borne by the Government of Sri Lanka, it is reasonable to state that the immunization programme in Sri Lanka is largely self funded.

All EPI (Expanded Programme on Immunization) vaccines are purchased under the budgetary allocations for drugs and surgical consumables in the Ministry of Health. Therefore, there is the risk that financial allocations for vaccines could be limited if the requirement of other drugs and surgical consumables are comparatively high. Other logistics required for the EPI are also purchased on the same basis along with other purchases. However, the government's expressed commitment to strengthen and develop the EPI ensures its protection even when there is an economic instability. The fact that EPI in Sri Lanka has a strong community support and is a demand driven programme also strengthens an uninterrupted service provision.

(Continued on page 2)

Cost estimates for immunization programme in Sri Lanka 2002-2012



A steady increasing cost for the national immunization programme is observed from 2002 up to now. This trend will continue hereafter too. The personnel and vaccines are the leading expenses in the total immunization budget. The cost for personnel (salaries and other payments) will be 40 - 50% of the total cost. There will be a dramatic increase in cost for vaccines from 2007, due to the incorporation of JE into EPI (in 2007) and possible introduction of combined DPT-Hep B-Hib vaccine (in 2008). This will bear 35 - 50% of the total cost of the immunization programme. Introduction of Mumps vaccine (as MMR vaccine) is the next in line to be added to EPI, for which the need assessment has not yet commenced, but mumps has been made a notifiable disease since 2006.

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The total programme cost for immunization services in Sri Lanka in year 2002 was 7,049,843 US$ of which 75% was spent for routine services. Shared personnel cost was accounted at around 50% of all expenses. The cost of routine vaccination programme including vaccines and injection supplies was just 20% of the total budget. Maintenance and overhead (3.2%), cold chain equipment (1.6%) and, shared transportation (1.4%) costs are not significant as they are part of the integrated primary health care system. Only less than 1% was spent for the training, disease surveillance and supervisions, for which the total support was received from the donor agencies. The remaining 25% was spent for supplemental immunization activities.

The EPI in Sri Lanka is receivig financial support from the Vaccine Fund of the Global Alliance for Vaccines and Immunization (GAVI) since 2003. When compared to 2002, by 2004 routine recurrent cost has been increased by 37%, particularly due to the introduction of new vaccines (Hepatitis B), whereas supplemental immunization activities (measles catch-up programme in 2004) and shared personnel cost increased by 25% and 38% respectively. GAVI funded hepatitis B immunization programme accounts for a 15% of routine vaccine cost.

The vaccine storage facilities at national and provincial levels are still inadequate and new cold rooms are in the process of installation. Once the provincial cold rooms are installed, it will minimize the cost of vaccine transport and thereby the cot of vehicle maintenance at both national and district levels. The maintenance and replacement of the cold chain facility at the districts will require around US$ 150,000 for the next 10 years. The cost required for improving additional storage facilities at divisional level is around US$ 750,000 . Maintenance of cold chain and overheads require around 3% of the total allocation.

Providing facilities for improved data management will require around an additional fund of US$ 50,000 annually. On the job special training programmes for field staff on EPI services, particularly on data management requires around US$ 10,000 annually and it is expected to obtain support from the routine country budget of WHO and UNICEF.

Secure fund for year 2004 is US$8.4 million and this is estimated to increase to US$ 10.8 million in 2008 and US$ 12.4 million in 2010. For the corresponding years the probable fund will increase from US$0.6 million in 2004 to US$ 4.9 million and 5.3 million in 2008 and 2010 respectively. The challenge is to ensure both increased secure and probable funds and to identify strategies to recover them.

Despite the government commitment to support the national EPI programme, increasing vaccine cost and demand for immunization have clearly indicated the possible financing vulnerability. In order to ensure a secure government fund for vaccines in future, it is proposed to introduce a separate budget line designated for the immunization within the Ministry of Health. This will increase the accountability and transparency in financing for immunization.

The EPI donors recognize Sri Lanka as a country for good investments. Therefore, all EPI planning and future strategies are focused to increase the country's reputation and sustain the present achievements. Donor support for introduction of new vaccine and improving the quality of immunization service and surveillance has been identified as one of the key strategies to ensure the sustainability of the programme.

Currently, on average, the vaccine cold chain maintenance is fairly satisfactory. Surveillance of adverse events following immunization (AEFI) is now an integral part of the EPI in Sri Lanka and ensure the quality and safety of the EPI activities. Introduction of Auto Disable syringes into the EPI since 2003 was to further ensure the injection safety. However safe disposal of used syringes causes problems at local level. Burning and burial have been identified as the feasible method at immunization clinics.

Sri Lanka has already taken steps to reduce vaccine wastage by introduction of open vial policy for liquid vaccines, rescheduling clinic sessions and use of different dose vaccine vials. Reprogramming the EPI schedule by introducing Japanese Encephalitis vaccine as a routine will save other resources, though the cost for vaccine would rise.

The expansion of the cold room facilities at central and provincial levels and the reorganization of the vaccine distribution plan in the long term will save not only the transport cost, but also the other savings from the total improvement of cold chain facility. Good data management will help to improve the resource mobilization and cost effective use of the resources. Every effort will be taken to retain qualified and trained personnel in public health service by providing more training opportunities (local and abroad) and other privileges for those who are in the scheme, thereby making public health services more attractive.

Sri Lanka will initiate bulk procurement practice in the near future with other regional countries. This may help to enhance purchasing power and will compensate the market competition.

In addition to the state sector, the private sector also provides immunization services to the community. While the Government of Sri Lanka, as a national policy, firmly supports the free health, will also support the increased private sector participation in EPI.

Improving the quality of immunization service, surveillance activities and cold chain facilities will be done through the donor support, particularly with the support of World Bank funds by establishing a model clinic in each Medical Officer of Health area. The proposals are finalised and approved and

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

08th - 14th September 2005 (41st Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	01 NE=1	00	00	00	00	01 MO=1	00	02	03	79	81	-02.5%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	00	00	00	00	00	00	00	00	01	40	66	-39.4%
Tetanus	00	00	00	00	00	00	00	00	00	00	27	37	-27.0%
Whooping Cough	02 GM=2	00	00	00	00	00	00	00	02	00	97	36	+169.4%
Tuberculosis	26	00	06	19	16	03	16	00	86	323	7878	7252	+08.6%

Table 2: Diseases under Special Surveillance

08th - 14th September 2005 (41st Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	31	17	04	00	02	02	03	10	69	58	4205	13923	-69.8%
Encephalitis	00	00	00	00	00	00	00	00	00	01	46	82	-43.9%
Human Rabies	00	00	00	00	01 KR=1	00	00	00	01	00	41	76	-46.1%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.; **NA**= Not Available

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :
Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.
DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

implementation will commence soon.

Epidemiology Unit will actively facilitate the carrying out of training and research on vaccine preventable diseases. A burden study on *Haemophilus influenzae B* has just been concluded. Currently, there are two ongoing large collaborative projects on Pneumococcal meningitis and Rota virus surveillance. Another study to test the vaccine efficacy for JE live attenuated vaccine is planned with the Programme for Appropriate Technology in Health (PATH). International training workshops of Global Training Network (GTN) for AEFI and Vaccine procurement are also coordinated by the Epidemiology Unit annually.

Sri Lanka has effectively controlled most traditional vaccine preventable diseases through superior levels of sustained immunization coverage. The public support for the programme and the commitment of the primary health care staff has significantly contributed to this. At the central level the maintenance of an uninterrupted service is also not simple and easy. However it has been possible to ensure the financial sustainability of the future programme. At the same time it is the responsibility of all healthcare staff to contribute in improving the quality of the service. Minimizing the vaccine wastage and adverse events following immunization and improving vaccine coverage emphasising in areas where poor coverage is already reported would be targeted activities in this effort.

This article is based on the Financial Sustainability Plan of Expanded Programme on Immunization in Sri Lanka - 2005. Special thanks to Dr. Ananda Amarasinghe, Assistant Epidemiologist for his assistance in preparation of this article.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

08th - 14th October 2005 (41st Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	09	1500	04	224	00	00	00	44	00	110	00	97	00	04	00	95	38
Gampaha	15	993	05	219	00	02	01	50	00	57	08	192	01	03	05	116	71
Kalutara	07	235	04	395	00	00	03	42	00	90	01	86	00	02	00	32	70
Kandy	14	376	08	360	00	01	03	99	00	12	01	43	01	66	00	78	82
Matale	03	38	02	278	00	02	00	23	01	23	00	34	00	00	00	10	67
Nuwara Eliya	00	14	01	266	00	00	04	172	00	290	00	09	00	21	00	22	43
Galle	00	64	01	120	00	04	00	12	00	17	01	72	00	08	00	09	50
Hambantota	01	30	00	234	00	00	00	08	00	41	00	40	01	64	00	15	70
Matara	03	98	02	162	00	02	01	30	00	30	01	137	02	120	00	11	71
Jaffna	00	10	01	137	00	01	00	278	00	18	00	01	00	86	00	67	25
Kilinochchi	00	02	00	31	00	00	00	07	00	27	00	00	00	00	00	06	00
Mannar	00	00	00	28	00	00	02	50	00	25	00	00	00	01	01	15	67
Vavuniya	00	23	02	108	00	03	03	192	01	20	00	01	00	00	01	07	75
Mullaitivu	00	00	00	14	00	00	00	24	00	02	00	00	00	03	00	07	100
Batticaloa	00	03	00	34	00	02	00	07	00	03	00	02	00	05	01	254	33
Ampara	00	10	06	96	00	00	00	05	00	09	00	13	00	00	00	29	14
Trincomalee	00	45	07	292	00	00	00	35	00	38	00	06	00	03	03	146	56
Kurunegala	01	85	11	341	00	02	01	63	00	35	00	16	00	11	00	62	71
Puttalam	01	104	03	70	00	02	02	155	01	05	00	20	00	00	02	35	78
Anuradhapura	01	68	03	133	00	02	01	22	00	105	00	74	00	16	01	42	47
Polonnaruwa	01	44	01	46	00	00	00	75	00	01	00	19	00	01	00	18	86
Badulla	03	32	11	517	00	00	02	176	00	21	01	63	03	86	03	152	67
Monaragala	00	11	11	150	00	01	00	42	00	19	00	88	01	84	02	74	80
Ratnapura	07	311	07	523	00	17	00	265	01	20	02	71	00	11	01	68	60
Kegalle	03	105	03	317	00	02	02	32	00	11	02	103	02	35	02	84	60
Kalmunai	00	04	01	67	00	03	00	21	00	01	00	00	00	03	08	205	55
SRI LANKA	69	4205	94	5162	00	46	25	1929	04	1030	17	1187	11	633	30	1659	60

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 22nd October 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WER SRI LANKA - 2005

Vol. 32 No. 43 **22nd - 28th October 2005**

Good pharmacy practice

In a flourishing market economy, private providers have started to play a dominant role in provision of pharmaceutical care. In such a scenario, the state's objective of providing safe and efficacious drugs to the consumer may loose to maximisation of profits by the private provider. The role of profit maximisation is more often associated with the risk of low quality of the practice at private pharmacies.

Policy analysts have identified mechanisms such as regulation, advocacy and monitoring as mechanisms to liaise with private providers. The state lays down rules, regulations and enforces such legislations through a legitimate body. In Sri Lanka, the relevant legislation is the Cosmetic Devices and Drugs (CDD) Act No 27 of 1980, amendments No 38 of 1984, Act No 27 of 1987 and Act No 12 of 1993. Cosmetic Drugs Devices Regulatory Authority (CDDA) exercises the enforcement of the act for the state. It is the duty of the authorised officers to ensure the provision of safe efficacious drugs to the consumers. In addition to the Food and Drug Inspectors (FDI), Deputy Provincial Director of Health Services (DPDHS) and divisional public health authorities such as the Medical officer of Health (MOH) have been specified by the CDD Act as authorised officers.

In order to provide safe and efficacious drugs to the consumers at the pharmacy level, it is imperative that these officers ensure the compliance with Good Pharmacy practices (GPP) by the pharmacy staff. GPP is defined as "the practice of pharmacy aimed at providing the best use of drugs and other health care services and products by patients and the members of the public". It emphasises that the welfare of the consumer is the prime concern at all times.

The elements of GPP can be categorised in to seven broad groups: licensing, physical environment of the pharmacy, order in pharmacy, storage of drugs, and maintenance of cold chain, dispensing and documentation. A recent study carried out in urban areas of Gampha district and rural Polonnaruwa district has focussed on the status of compliance with the GPP at retail pharmacies.

A substantial floor area is a pre requisite for issuing recommendation for licensing of a pharmacy. Though a floor area of more than 120 square feet is a pre requisite for recommendation for licensing, It has been highlighted that this has not been adhered in certain occasions. Inadequate floor area of pharmacies presents problems such as difficulty in movement, lack of space to fix a wash basin and for proper placement of refrigerators. Improper placement of a refrigerator may adversely affect the maintenance of the cold chain thereby perishing life-saving drugs while inadequate space to move about may influence the efficiency of dispensing medicines.

Another pre requisite for issuing a licence for a retail pharmacy is the availability of a water supply with the requirement of a wash basin with its location in an easily accessible place. According to the study, this has been poorly adhered to in majority of pharmacies in the study areas. Some pharmacies did not have spacious premises to locate a wash basin while the reason for non availability of a wash basin in certain pharmacies which had adequate space was mere ignorance of this requirement. It was elicited that the reason for recommending license without fulfilling these pre conditional requirements was to improve the access to drugs. However, it is clear that such a move drastically reduces the quality of pharmaceutical services offered by the pharmacies.

Drug regulation 43(b) specifies that the premises shall have proper storage conditions for preserving the properties of drugs. In Sri Lanka, the average room temperature exceeded

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30°C and this had been observed in majority of inspected pharmacies. Installing air conditioners was affordable only to a handful of owners of large scale pharmacies. The High ambient temperatures of the pharmacy interior pose a problem for drugs that should be kept within 15-25 °C. The question of the efficacy of these medicines arises as a result of prolonged exposure to these temperatures exceeding 25°C. Testing of these samples is thus essential to ascertain the quality failure.

Another issue that was highlighted in the pharmacy study was the inadequate coverage of an alternative power supply to be used in an event of prolonged power failure. Of the pharmacies which did not have an alternative power supply, almost all did not have an alternative arrangement to move vaccines and other drugs that needed a storage temperature between 2-8°C in an event of a prolonged power failure. This presents an inherent danger in terms of providing efficacious drugs to the consumers as Pharmaceuticals that need a storage temperature between 2-8°C are found in majority of pharmacies. Vaccines for human consumption were also available in more than two third of inspected urban and rural pharmacies while veterinary vaccines were available only in 1/3 of the pharmacies.

The commonest vaccine that was found in private pharmacies in both urban and rural district was the Tetanus Toxoid. Two thirds of the pharmacies had this vaccine. In rural pharmacies, other types of vaccines were not available. This reflects the low demand of vaccines in the private sector due to the better access to vaccination in the public sector. This was almost similar in the urban sector. However in a handful of pharmacies in the urban sector, Oral Polio, Measles Mumps & Rubella (MMR), Hepatitis A, Hepatitis B, and *Haemophilus influenza* B (Hib) vaccines were available.

Though the maintenance of the temperature was an important aspect of ensuring the potency of vaccines and drugs, the temperatures inside the refrigerator exceed 2-8°C in majority of pharmacies. Thermometers were not available. Recording of the temperature had been carried out only in exceptional cases. Since pharmacies are business premises, drugs, food and beverages are stored together in the refrigerator. As a result, the space of the drugs food and beverages took up more than 50% of the total space in refrigerators in many pharmacies. Frequent opening of the refrigerator and the warmth of food and beverages cause the temperature to rise within the refrigerators affecting the potency of the drugs. Non availability of water bottles and ice packs also increase the temperature within the refrigerator. Additionally, practice of compact storage of vaccines, drugs, foods and beverages cause poor circulation of air between drugs and vaccines.

In majority of bigger pharmacies, the drugs had been stored even in doors of the refrigerator exposing them to the room temperature whenever the refrigerator was opened. However, smaller pharmacies do not stick to this due to the small numbers of vaccines and refrigerated drugs in their refrigerators.

All these observations suggest the questionable potency of drugs and vaccines available in pharmacies. In Contrast to this, in the public sector, there is a well established system of monitoring of Cold Chain. Cold Chain monitors indicate the need for quick use or discarding vaccines. There are hierarchical officers who monitor the cold chain ensuring the efficacy of the vaccine.

In Sri Lanka, as the majority of pharmacies are situated facing to motorable roads, dust is very common. However, the contamination with dust can be minimised by adhering to the practice of shutting down doors of shelves after transactions. In certain pharmacies, there were expired drugs contrary to the regulation 46 (b) of the CDD Act. The finding is suggestive of some deficiencies: inadequate or infrequent inspection by authorised officers, owners/staff not willing to have regular inspection of shelves and removal of expired drugs and non availability of a system to identify slow moving drugs when the expiry dates are close. The other danger is that the slow moving expired drugs especially when not dispensed in original pack can be sold to the clients.

The other biggest concern was the non availability of a proper mechanism to destroy expired drugs. The expired items are discarded to the rubbish collection in many pharmacies and subsequently removed by garbage disposal units of the local bodies as only a handful of drug companies collect expired items. This contravenes the Regulation No.72 of the CDD Act which specifies that any drug which fails to confirm to the specified standards or the storage life of which has expired shall be destroyed under the supervision of an officer authorised by the authority.

(Continued on page 3)

CONDITIONS THAT IS EXPECTED IN A PHARMACY

- Should display the pharmacy registration certificate, business registration certificate and the pharmacist's registration along with his photograph at a conspicuous place
- The pharmacist should be physically present in the pharmacy.
- The floor area should be not less than 120 sq. ft.
- If other grocery items are selling, a separate area and a separate person for drugs
- A wash basin and a towel
- Proper light and ventilation
- Floor of the pharmacy should be free of dampness
- There should be a ceiling for the roof
- Walls should be painted with a waterproof paint such as rubber paint
- There should not be what so ever water leaking inside
- If drugs are dispensing, facility for boiled, cooled, filtered water
- Pesticides and other agrochemicals should not be kept with drugs
- Drugs should be stored at least 4 inches above the floor level and one foot (at least 6 inches) away from walls
- If bulks are stacked, they should not be more than 8 feet high
- Drugs should be stored in covered places such as cupboards to prevent from contamination with dust
- Drugs should be kept away from direct sunlight
- Drugs should be stored in the specified optimum temperature for each drug
- Should store in a way that first received drugs are dispensed first
- Drugs should be stored in an orderly manner that can be traced easily (e.g. in alphabetical order)
- All drugs should be along with the original container
- Expired drugs should not be displayed or sell
- Drugs with the crown mark or other signs of state (e.g. FHB, C.R. No) are prohibited for sale
- Should keep a register of all drugs
- Should maintain, Drugs purchasing register, Correspondence file, Price list and the Prescription register

Table 1: Vaccine-preventable diseases & AFP

15th - 21st September 2005 (42nd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 CB=1	00	00	00	00	00	01 BD=1	00	02	01	81	82	-01.2%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	01 KD=1	00	00	00	00	00	00	01	02	42	68	-38.2%
Tetanus	00	00	00	00	00	00	00	00	00	00	27	37	-27.0%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	97	36	+169.4%
Tuberculosis	61	34	05	32	21	00	00	00	153	40	8031	7292	+10.1

Table 2: Diseases under Special Surveillance

15th - 21st September 2005 (42nd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	32	10	01	00	03	01	00	10	57	63	4287	14001	-69.4%
Encephalitis	00	01 KD=1	00	00	00	00	00	00	01	02	48	85	-43.5%
Human Rabies	00	00	00	00	00	00	00	00	00	03	42	80	-47.5%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.; **NA**= Not Available

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

The CDD Act has clearly specified its objective of providing safe and efficacious drug supply to consumers. The Sri Lankan experience demonstrates that there is a divergence of the service provider's objective of profit maximisation from the objective of the CDD Act. As pointed out by health policy analysts, regulation and monitoring remain the core mechanisms to approximate these two objectives. Many of these deficiencies can be corrected within the current system. In order to effectively implement these regulatory mechanisms, routine monitory mechanism should be strengthened with introduction of targets for the officers involved.

It is imperative that more focus should be on the storage of drugs including cold chain items. At the district level, the services of the Regional Epidemiologists can be used by the Deputy Provincial Directors to improve maintenance of cold chain at private pharmacies. Regional Epidemiologists are specially trained by the Epidemiology Unit to supervise maintenance of cold chain in curative and preventive institutions in the public sector. As the CDD Act specifies the Medical Officer of Health as an authorised officer, he can also be utilised for this purpose. Independent monitoring of the elements of GPP by MOH in addition to the FDII will be an additional measure to improve the provision of efficacious drugs to consumers. As the disposal of bio waste remains a problem in relation to drugs, it is timely to consider a central low-cost model bio-waste plants at district levels. Mechanisms need to be worked out to collect and safely dispose of expired drugs under the supervision of authorised officers at the district level.

This article was based on the study "Pharmaceutical consumption among adults, private pharmacy services and implementation of drug regulations in a selected urban and rural district" done by Dr. P.R.Wijesinghe, for his MD Community Medicine thesis.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

15th - 21st October 2005 (42nd Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	28	1535	07	232	00	00	02	46	01	111	01	102	00	04	00	96	62
Gampaha	03	1002	03	225	00	02	01	52	00	57	02	194	00	03	02	119	43
Kalutara	01	238	03	401	00	00	00	42	00	90	00	86	00	02	01	33	30
Kandy	08	390	04	364	01	02	10	109	00	12	00	43	00	66	01	79	68
Matale	02	40	01	279	00	02	00	23	00	23	00	34	00	00	01	11	42
Nuwara Eliya	00	14	03	273	00	00	03	176	00	290	00	09	01	22	00	22	57
Galle	00	64	00	120	00	04	01	13	00	20	02	74	00	08	00	09	81
Hambantota	00	30	02	236	00	01	00	08	00	41	00	40	00	64	00	15	70
Matara	01	101	04	167	00	02	00	31	00	30	00	137	00	120	00	11	71
Jaffna	00	11	07	145	00	01	00	279	00	19	00	01	00	86	00	67	25
Kilinochchi	00	02	00	31	00	00	00	07	00	27	00	00	00	00	00	06	50
Mannar	00	00	00	28	00	00	00	50	00	25	00	00	00	01	00	15	00
Vavuniya	00	23	01	109	00	03	01	193	00	20	00	01	00	00	00	07	50
Mullaitivu	00	00	00	14	00	00	00	24	00	02	00	00	00	03	00	07	00
Batticaloa	00	03	00	34	00	02	00	07	00	03	00	02	00	05	00	254	22
Ampara	00	10	00	97	00	00	00	05	00	09	00	13	00	00	00	29	00
Trincomalee	00	45	01	296	00	00	00	35	00	38	00	06	00	03	00	146	33
Kurunegala	03	88	16	362	00	02	00	64	00	35	00	16	00	11	00	62	71
Puttalam	00	104	01	72	00	02	04	159	00	05	02	22	00	00	04	39	56
Anuradhapura	01	69	06	140	00	02	00	22	00	105	00	74	00	17	00	42	42
Polonnaruwa	00	44	01	47	00	00	00	75	00	01	00	19	00	01	00	18	100
Badulla	00	32	27	551	00	00	00	177	00	27	00	63	01	88	01	156	60
Monaragala	00	11	00	152	00	01	00	43	00	19	00	88	00	85	04	78	40
Ratnapura	08	319	05	529	00	17	00	265	00	20	01	74	00	11	00	70	73
Kegalle	02	108	00	317	00	02	01	33	00	11	03	106	01	36	00	85	50
Kalmunai	00	04	00	68	00	03	00	21	00	01	00	00	00	03	04	209	18
SRI LANKA	57	4287	92	5289	01	48	23	1959	01	1041	11	1204	03	639	18	1685	52

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 29th October 2005 :Total number of reporting units = 276.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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Comments and contributions for publication in the WER Sri Lanka are welcome. However, the editor reserves the right to accept or reject items for publication. All correspondence should be mailed to The Editor, WER Sri Lanka, Epidemiological Unit, P.O. Box 1567, Colombo or sent by E-mail chepid@sltnet.lk

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WEEKLY EPIDEMIOLOGICAL REPORT
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Vol. 32 No. 44 29th October - 04th November 2005

SRI LANKA - 2005

WER

Reducing measles vaccine wastage

Unlike in many low income countries where immunization activities are largely dependant on donor support, the major contribution to the Expanded Programme on Immunization (EPI) in Sri Lanka is by the Government. For example, in 2002, 98% of the cost of the immunization programme has been borne by the Government. Backed by a good public support and strengthened by the Government's commitment EPI in Sri Lanka is the strongest public health programme in Sri Lanka. During the recent past several steps have been taken to improve the quality of the programme. In addition, more activities to improve the quality of the programme and introduction of new vaccines to the EPI is planned and will be implemented in future. This requires a colossal sum of public funds.

In the contemporary society improved productivity is an essential criterion to sustain any programme, especially when the availability of funds are limited. This is equally valid to the immunization programme too. Reducing the vaccine wastage to the maximum possible limit should be considered in parallel to this objective.

Use of ten dose vaccine vials for all vaccines since the inception of EPI is aimed at reducing the cost. The cost per dose substantially lowers when multi-dose vaccine vials are used in place of single dose vials. However, in instances where a ten dose vial has to be opened for a

(Continued on page 2)

WER is now in the web on time

The Epidemiology Unit publishes the Weekly Epidemiological Report (WER) since late1970's. This is probably the oldest weekly publication in disease surveillance in the region which was originated for the purpose of providing a feedback to the field staff whose untiring effort paved the basis for surveillance data. If not, the Weekly Return of Communicable Diseases (WRCD) has been sent punctually by the Medical Officers of Health there would not be a WER. During this period of three decades of its publication the WER has evolved gradually improving the quality of its content and also its readability, print and distribution. We are proud to announce that at present the WER is posted in time on our website. At this juncture, we pay our humble gratitude to all MOOH throughout the history who bothered to send the WRCD on time, the UNICEF who took the entire burden to provide funds for its printing, SoftWave for their contribution by printing it without delay and the readers who patiently waited for its arrival even though it was late.

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very few number of clients the wastage is high. The open vial policy on liquid vaccines introduced early this year has been successful to improve the cost effectiveness of the programme. When the Hepatitis B vaccine was incorporated into the EPI in 2001, a combination of multi-dose vials - two dose and ten-dose had been introduced in a ratio of 25%: 75%. This has been proven to be effective in reducing the cost.

A study carried out in the Puttalam district in 2002 also demonstrated that the correct combination of multi-dose vials would reduce vaccine wastage and thereby the cost. In this study the attendance pattern for immunization in all immunization clinics in the Puttalam district for the year 2001 was analysed. Puttalam is one of the two districts in the North Western province. There are nine Medical Officer of Health (MOH) areas in the district. Immunization services to the community are delivered at 140 clinic centres spread throughout the district. Analysis is done on the total attendance to the clinics and is based on the data available in Clinic Immunization Registers maintained at the respective immunization clinics and Vaccine Movement Registers maintained at MOH offices and hospitals.

There was a total of 2884 clinical sessions conducted during the year 2001 in the Puttalam district. Out of this in 2456 clinical sessions 14125 children were provided with Measles vaccine. In more than half of these clinical sessions there were five or a lesser number of children to obtain Measles vaccine.

Attendance pattern for measles immunization in the Puttalam DPDHS area in 2001 and minimum number of vaccine vials required

Attendance pattern (No. of clients)	No. of attendance	Frequency of occurrence	Percentage of frequency of occurrence	No of vials required if use 10 dose vials only	No of vials required if use 5 and 10 dose vials simultaneously	
					Five dose	Ten dose
1 – 5	4313	1330	54.15	1330	1330	00
6 – 10	7020	932	38.95	932	00	932
11 – 15	1762	140	5.70	280	140	140
16 – 20	801	45	1.83	90	00	90
21 – 25	111	5	0.20	15	05	10
26 – 30	81	3	0.12	09	00	09
31 – 35	00	00	0.00	00	00	00
36 – 40	37	01	0.04	04	00	04
Total	14125	2456	100.00	2660	1475	1185

As shown in the Table, in current practice, 2660 ten dose Measles vaccine vials would be needed to meet the demand. The minimum wastage of vaccine would be 46.9%. If a combination of five and ten dose vials could be used instead of only ten dose vials, the vaccine wastage could be brought down to a minimum level of 26.5%. This would be a 20% reduction of wastage. Since there are no marked differences in EPI activities in different parts of the country, it is reasonable to assume that these figures are valid at a national level.

Measles vaccine records a high level of wastage in EPI Sri Lanka and is around 50%. As well Measles is one of the expensive vaccines used in the EPI. This costs US $ 1.10 and 0.85 for each ten dose and five dose vial respectively. Although per-dose cost of a five dose Measles vaccine vial is closer to twice the cost of a ten dose vial, a correct combination of these two types of vials will be cost effective. Thirty eight percent from five dose vials and 62% from ten dose vials is found to be the best combination. By employing this at a national level it is estimated that over Rs. 0.7 million can be saved annually.

- Based on the findings discussed in the article, it has been decided to initiate the use of both five dose and ten dose Measles vaccine vials in the EPI in Sri Lanka. Therefore, in addition to the ten dose Measles vaccine vials, five dose vials also have been already imported to the country. They will soon be distributed to the MOH offices. As the local authority in immunization, the MOH should make arrangements to distribute the required number of five dose and ten dose Measles vaccine vials in a ratio of 30%: 70% to each immunization centre based on the attendance records of each clinic in the area.

- Both five dose and ten dose Measles vaccine vials and diluent ampoules for current use are supplied by the same manufacturer. Although five dose vaccine vials are little smaller than the ten dose vial, the 2.5 ml and 5 ml diluents are filled in the same size ampoules. Therefore, when the vaccine is reconstituted utmost care should be taken to select the diluent with the correct volume. Same care should be taken in vaccine distribution too. This is to ensure that correct stocks of diluent ampoules are sent along with each type of vaccine vials.

- Unless the staff at the immunization clinic take the correct decision whether to open the five dose or ten dose Measles vaccine vial, all these efforts would be in vain. It should be borne in mind that the cost per dose of five dose Measles vaccine is higher than that of the ten dose vial.

The study in the Puttalam DPDHS division is carried out by the Regional Epidemiologist, Puttalam Dr. S. D. M. P. Gunasekara and Assistant Epidemiologist Dr. T.S. R. Peiris.

Table 1: Vaccine-preventable diseases & AFP

22nd - 28th September 2005 (43rd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 GM=1	00	01 MT=1	00	00	00	01 MO=1	01 KG=1	04	00	85	82	+03.7%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	00	00	00	00	00	00	00	00	01	42	70	-40.0%
Tetanus	01 CB=1	00	00	00	00	00	00	00	01	01	28	38	-26.3%
Whooping Cough	01 GM=1	00	00	00	00	00	00	00	01	02	98	38	+157.9%
Tuberculosis	83	16	26	18	19	01	00	26	189	112	8220	7404	+11.0%

Table 2: Diseases under Special Surveillance

22nd - 28th September 2005 (43rd Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	22	16	03	00	00	01	00	02	44	55	4366	14071	-69.0%
Encephalitis	00	00	00	00	01 PU=1	00	00	01 RP=1	02	00	50	86	-41.9%
Human Rabies	00	00	00	00	00	00	00	00	00	00	44	82	-46.3%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.; **NA**= Not Available

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 1)

WER is now in the .....

Over the years all Chief Epidemiologists struggled to release the WER in time. Throughout the history many Epidemiologists and medical officers who served in the Epidemiology Unit silently but courageously contributed to its success and to distribute it regularly although there were delays.

The present team of Epidemiologists at the Epidemiological Unit assures all readers that the Epidemiology Unit is determined to produce the WER in time and it would appreciate if you can send your comments indicating your needs which may be very useful in improving the WER.

Please visit our web site: www.epid.gov.lk every Tuesday where you will find the current issue of the WER.

Chief Epidemiologist

Table 3: Selected notifiable diseases reported by Medical Officers of Health

22nd – 28th October 2005 (43rd Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	02	1541	00	232	00	00	00	49	00	111	01	104	00	04	00	96	46
Gampaha	17	1026	06	232	00	02	00	53	00	57	01	195	01	04	01	121	57
Kalutara	03	251	03	410	00	00	00	43	00	90	01	87	00	02	00	34	50
Kandy	14	408	02	367	00	02	01	110	00	12	02	45	00	66	02	81	64
Matale	02	42	02	282	00	02	00	23	00	23	00	34	00	00	01	12	50
Nuwara Eliya	00	15	05	282	00	00	03	183	00	290	01	10	01	23	00	23	86
Galle	01	66	04	124	00	04	00	13	01	21	01	75	00	08	00	09	56
Hambantota	01	31	00	240	00	01	00	08	00	41	00	40	01	68	00	15	60
Matara	01	102	04	171	00	02	01	32	00	30	00	137	02	122	00	11	100
Jaffna	00	11	01	148	00	01	01	280	00	19	00	01	00	86	01	68	50
Kilinochchi	00	02	02	33	00	00	00	07	00	27	00	00	00	00	00	06	25
Mannar	00	00	01	30	00	00	00	50	00	25	00	00	00	01	00	15	83
Vavuniya	00	23	01	112	00	03	00	194	00	20	00	01	00	00	00	07	50
Mullaitivu	00	00	00	14	00	00	00	24	00	02	00	00	00	03	02	09	100
Batticaloa	00	03	01	35	00	02	00	07	00	03	00	02	00	05	05	265	56
Ampara	00	10	00	100	00	00	00	05	00	09	00	13	00	00	00	29	00
Trincomalee	00	45	00	299	00	00	00	37	00	38	00	06	00	03	03	152	44
Kurunegala	00	88	02	366	00	02	00	64	00	35	00	16	00	11	00	62	41
Puttalam	00	105	07	81	01	03	00	159	00	05	01	23	00	00	00	41	67
Anuradhapura	00	74	00	141	00	02	00	24	00	105	00	74	00	17	00	43	37
Polonnaruwa	01	45	02	49	00	00	00	75	04	05	00	19	01	02	00	18	57
Badulla	00	32	09	562	00	00	00	177	00	27	00	63	01	89	02	162	27
Monaragala	00	11	02	158	00	01	01	44	00	19	00	88	00	86	02	80	80
Ratnapura	01	321	06	539	01	18	00	267	00	20	00	74	00	11	00	71	53
Kegalle	01	110	02	321	00	02	00	34	00	11	01	108	01	37	02	87	60
Kalmunai	00	04	00	69	00	03	00	22	00	01	00	00	00	03	14	225	27
SRI LANKA	44	4366	62	5397	02	50	07	1984	05	1046	09	1215	08	651	35	1742	53

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 05th November 2005 :Total number of reporting units = 279.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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Vol. 32 No. 45 05th - 11th November 2005

SRI LANKA - 2005

WER

Local scenario of a global challenge

Tuberculosis remains one of the leading infectious causes of death despite the efforts of many healthcare inputs all over the world. It is not simply a problem hanging over from the past, but a growing challenge and is a global emergency being very much in the limelight due to its association with HIV/AIDS and development of multi-drug resistant strains.

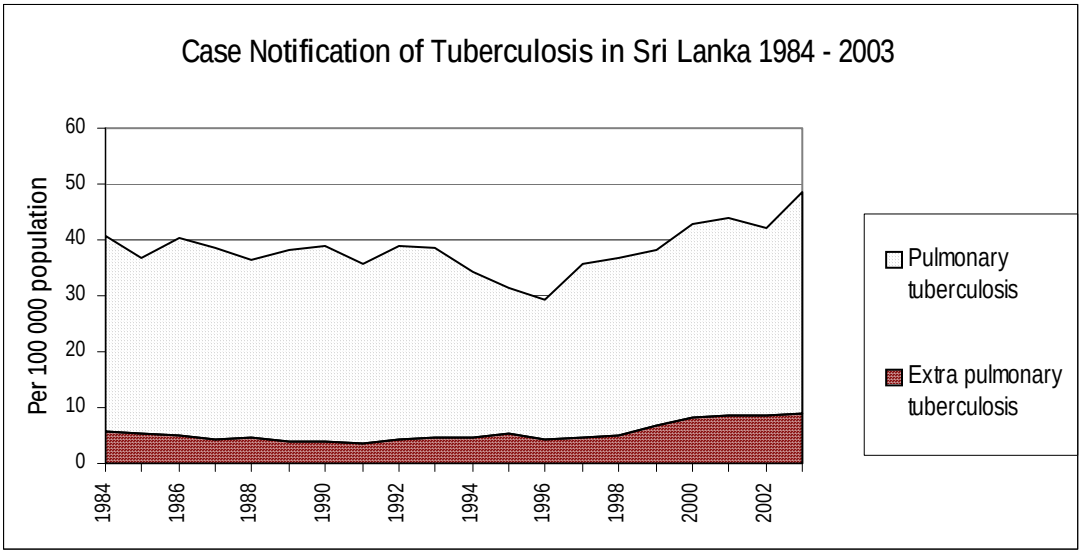
The history of tuberculosis (TB) control activities in Sri Lanka is documented since 1916 with the establishment of the Anti Tuberculosis Institute in Pettah. In 1945, Anti Tuberculosis Campaign was established and in 1988 it was re-named as Respiratory Disease Control Programme. In 2001 the name was changed to National Programme for Tuberculosis Control and Chest Diseases (NPTCCD). It is a decentralized unit of the Ministry of Health, headed by the director /NPTCCD and functions under the Deputy Director General of Public Health Services (DDGPHS 1).

The NPTCCD functions through a network of 23 district chest clinics (DCC), over 41 branch chest clinics, 2 chest hospitals and 10 chest wards in close co-ordination with other general health institutions.

Directly Observed Treatment Short-Course (DOTS) strategy is the internationally recommended approach to TB control. By the end of 2003, there were 15 districts in the country where DOTS were implemented. This is 80.7% of the total population coverage by DOTS.

The targets for TB control were set by the World Health Assembly in 1991 and are:

(Continued on page 2)



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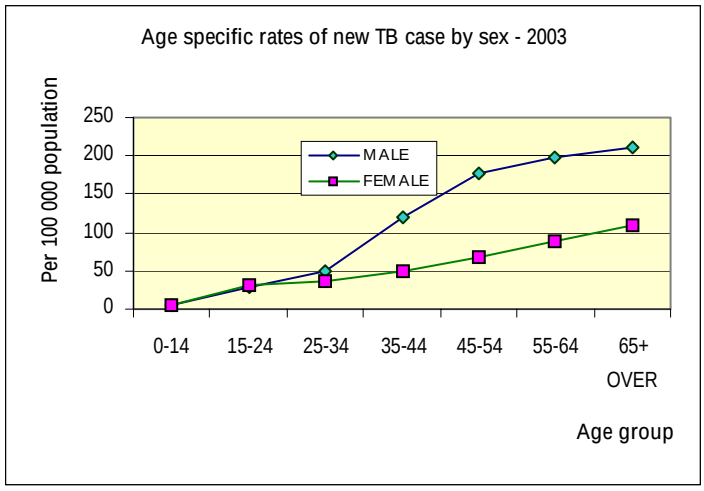
- To detect 70% of the estimated smear positive cases and
- To treat successfully 85% of the detected smear positive TB cases.

In terms of surveillance all TB cases are divided into two groups as pulmonary tuberculosis (PTB) and extra-pulmonary tuberculosis. Depending on the results of sputum smear PTB cases are again divided in to sputum smear positive and sputum smear negative tuberculosis.

The estimated incidence of TB for the country in the year 2002 was 10280 cases of all forms and 4623 cases of smear positive pulmonary tuberculosis cases. In 2003, the total number of new cases of TB of all forms reported to the centre was 9312. This consisted of 7603 PTB cases out of which 62% (4739) were sputum smear positive for TB bacillus. This accounts for 102.5% case detection rate.

There has not been a significant decline in the TB incidence over years as around 8500 - 9000 new cases has been detected annually. Since 1996 the incidence of TB has increased gradually but steadily. Improved case detection, especially in districts where TB control activities have been inadequate in the past and also regulation of referrals and improved notification could have contributed for this increase. However, a true increase in the incidence of the disease should be seriously considered.



The proportion of pulmonary TB out of all TB cases has remained almost same. On the other hand, the proportion of sputum smear positive pulmonary TB cases has declined gradually. The number of extra pulmonary TB cases reported over years are increasing. Among them, 34% were TB lymphadenitis.

The incidence of TB before 15 years of age is very low. The rate gradually increases with advancing age. Males show a much higher increase than females. The male to female ratio of TB incidence is 2:1.

In 2002, among sputum smear positive cases the cure rate was 77.5% and a further 3.2% completed treatment (without laboratory confirmation of cure) giving an overall treatment success rate of 80.7%. The treatment success rate varies across districts from 90.3% in Matara to 75.8% in Colombo (among

(Continued on page 3)

Case detection rate	Annual new smear-positive cases / Estimated annual new smear-positive incidence
Treatment success rate	The proportion of patients who complete their entire Course of treatment with or without bacteriological confirmation of cure.

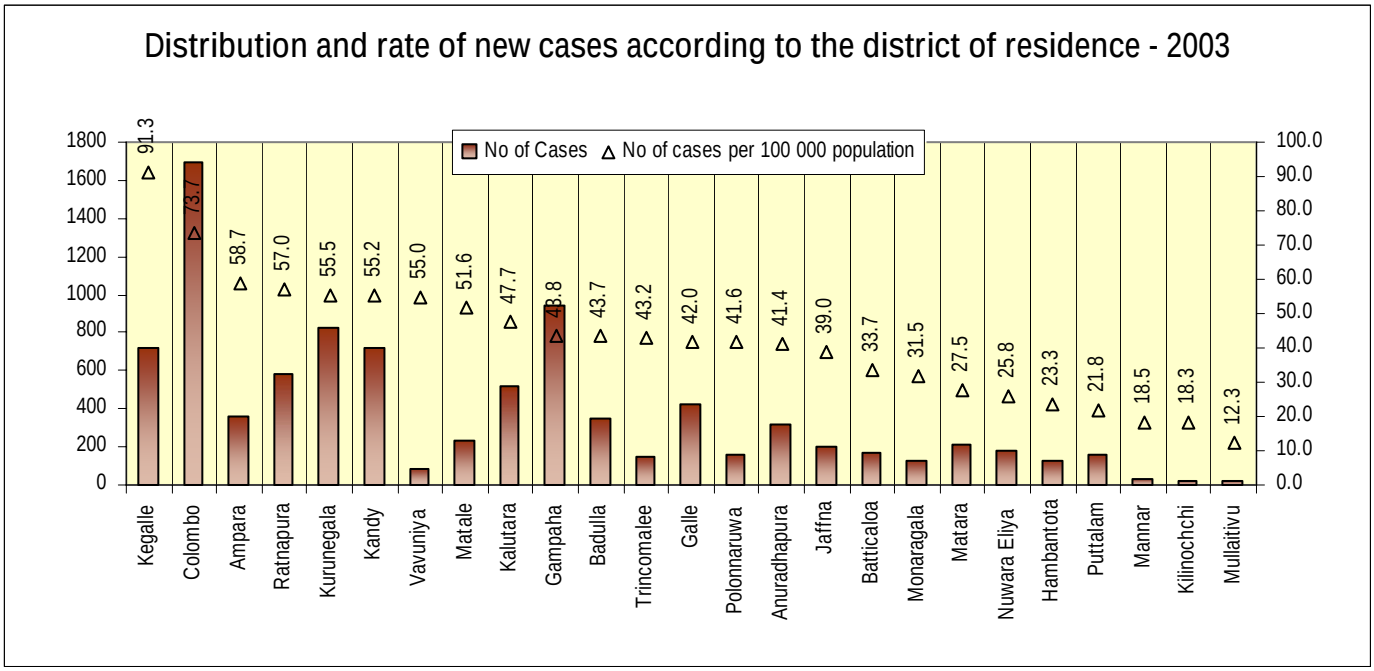


Table 1: Vaccine-preventable diseases & AFP

29th October - 04th November 2005 (44th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	01 KD=1	00	00	00	00	00	00	01	02	86	84	+02.4%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	00	00	00	00	00	00	00	00	00	44	70	-37.1%
Tetanus	00	00	00	00	00	00	00	00	00	01	30	40	-25.0%
Whooping Cough	00	00	02 MT=1HB=1	00	00	00	00	00	02	02	102	40	+155.0%
Tuberculosis	124	05	03	21	19	33	08	12	225	265	8445	7669	+10.1%

Table 2: Diseases under Special Surveillance

29th October - 04th November 2005 (44th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	50	07	03	00	01	03	01	10	75	82	4485	14183	-68.4%
Encephalitis	00	00	00	00	00	00	00	00	00	01	51	87	-41.4%
Human Rabies	00	00	00	00	00	00	00	01 RP=1	01	01	45	85	-47.1%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.; **NA**= Not Available

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

districts under DOTS) and 66.2% in Vavuniya (among districts not under DOTS). However, the overall treatment success rate of non-DOTS areas is 79.9% and is very much closer to that of the DOTS areas.

Treatment failure and defaults are concerning factors that influence on the treatment success rate. The treatment failure was recorded only among 25 sputum smear positive patients giving a rate of 0.6 per 100 000 population. The national defaulter rate was 12.1%. There were 521 defaulters out of which 214 (41.1%) were residing in the Colombo district. Among the re-treatment group also there were 26.7% of defaulters. Despite the efforts by chest clinic Public Health Inspectors (PHII) as well by range PHII, to trace defaulters, the defaulter rate remains high in urban areas. The high percentage of floating population in urban areas is one of the reasons for the observed high defaulter rate.

Sources:

National Programme for Tuberculosis Control and Chest Diseases, Sri Lanka. Annual Report 2003.

Department of Health Services, Sri Lanka. Annual Health Bulletin 2002.

The WER editor wishes to acknowledge Dr. Manori Malawaraarachchi for her contribution in preparation of this article.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

29th October - 04th November 2005 (44th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	24	1586	06	245	00	00	01	51	00	112	07	119	00	04	00	96	77
Gampaha	16	1047	07	248	00	02	01	59	01	61	02	199	00	03	00	121	100
Kalutara	10	262	09	422	00	00	00	43	00	90	00	88	00	02	00	34	90
Kandy	06	419	07	377	00	02	02	113	09	25	01	46	00	66	01	84	73
Matale	01	44	07	292	00	02	00	23	03	26	00	34	00	00	00	12	92
Nuwara Eliya	00	15	01	284	00	00	01	184	00	290	00	10	00	23	00	23	86
Galle	01	69	03	128	00	04	01	14	00	21	00	76	00	08	00	09	63
Hambantota	01	33	04	246	00	01	00	08	00	41	00	40	01	69	00	15	90
Matara	01	103	04	175	00	02	00	32	00	30	00	137	00	122	00	11	93
Jaffna	00	11	04	154	00	01	01	289	00	19	00	01	00	86	01	70	75
Kilinochchi	00	02	02	35	00	00	00	08	00	27	00	00	00	00	00	06	50
Mannar	00	00	00	30	00	00	00	54	00	25	00	00	00	01	00	16	67
Vavuniya	00	23	05	118	00	03	00	194	00	20	00	02	00	00	02	09	50
Mullaitivu	00	00	00	14	00	00	00	24	00	02	00	00	00	03	00	09	100
Batticaloa	00	03	00	35	00	02	00	07	00	03	00	02	00	05	03	277	33
Ampara	00	10	07	109	00	00	00	05	00	09	00	13	00	00	01	32	57
Trincomalee	00	45	00	303	00	00	01	38	00	38	00	06	00	03	01	154	56
Kurunegala	01	89	14	385	00	02	01	65	00	35	01	17	00	11	00	63	94
Puttalam	00	105	24	107	00	03	00	159	00	05	00	23	00	01	01	42	89
Anuradhapura	02	79	06	152	00	02	00	24	00	105	00	74	00	17	00	44	74
Polonnaruwa	01	46	02	52	00	00	00	75	00	05	00	19	00	02	00	18	86
Badulla	01	33	08	580	00	00	00	188	00	27	00	63	01	91	04	168	87
Monaragala	00	11	12	171	00	01	11	55	00	19	00	88	09	95	04	84	100
Ratnapura	09	335	07	559	00	19	02	269	01	21	02	77	00	11	02	73	80
Kegalle	01	111	03	326	00	02	00	34	00	11	03	112	01	38	01	88	70
Kalmunai	00	04	00	73	00	03	00	23	00	01	00	00	00	03	04	245	45
SRI LANKA	75	4485	142	5620	00	51	22	2038	14	1068	16	1246	12	664	25	1803	77

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 12th November 2005 :Total number of reporting units = 279.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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Vol. 32 No. 46 12th - 18th November 2005

WER SRI LANKA - 2005

Bridging the gaps in vaccine management

The Epidemiology Unit is responsible for estimation of the annual vaccine requirement for the country. Procurement of vaccine is done through the State Pharmaceutical Corporation. Upon arrival in the country, all vaccines are stored under the custody of the Epidemiology Unit at the central cold rooms located at the Epidemiology Unit and the National Hospital of Sri Lanka. When the storage capacity is inadequate, cold rooms in the private sector are hired for the purpose.

All districts of the country have Regional Medical Supplies Divisions (RMSD) responsible for stocking and distributing all health supplies to the health facilities within the districts. Epidemiology Unit is responsible for delivery of vaccines to RMSDs where these vaccines are stored in cold rooms, freezers and refrigerators. Vaccine storage temperatures are monitored by RMSDs as per WHO/ UNICEF recommendations and instructions from Epidemiology Unit. RMSDs deliver vaccines and injection supplies to the Medical Officers of Health (MOH) numbering to 279 all over the country.

MOOH store vaccine in refrigerators and distribute to 1800 medical institutions and over 6000 clinics for vaccination. Most of the clinics do not have any refrigerators and vaccine is delivered to them by MOH on the morning of the immunization session. All un-used and opened liquid vaccine vials are collected back by MOH after the clinic services for intended use at subsequent sessions under the 'use of open vaccine vial policy'. Reconstituted vaccines are discarded at the end of the session at clinics.

All vaccines are sensitive biological substances. The higher the temperature to which the vaccine is exposed, the quicker is the loss of potency. Some vaccines are also sensitive to freezing and this can cause irreversible damage. The only way that it is possible to prove that vaccines have been stored at the correct temperature at all times is by using a continuous temperature recording device or regular manual temperature records. The temperature records must be inspected regularly and retained for auditing purposes.

Recently, the Epidemiology Unit opted for an external assessment of the vaccine cold chain management through UNICEF. This is for an objective assessment to ascertain qualitative and quantitative needs of vaccine storage and distribution system. This assessment was carried out at national, sub national (district) and point of service provision (MOH) levels and was under-

(Continued on page 2)

Avian Influenza updates

The following documents are available at the Epidemiology Unit web site.

- *Avian influenza fact sheet*
- *National influenza pandemic preparedness plan of the Ministry of Health*
- *Sri Lanka exotic disease emergency plan of the Division of Animal Health, Department of Animal Production and Health*

http://www.epid.gov.lk/Disease%20Situations.htm

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1. National level scores as per EVSM Questionnaire

Indicator	Score (%)
Reshipment and arrival procedures	86
Maintaining correct storage temperatures	86
Maintaining sufficient cold storage capacity	100
Buildings, equipment and transport	48
Effective maintenance	80
Effective stock management	65
Reliable delivery to intermediate stores and minimizing damage during distribution	78
Standard operating procedures	No score
Financial and human resources	No score

taken by the World Health Organization (WHO), UNICEF and the Epidemiology Unit.

Three teams carried out the survey through the Effective Vaccine Stores Management (EVSM) questionnaire/ Vaccine Management Assessment tool (VMA) developed by WHO. One Regional Medical Supplies Division (RMSD), two Medical Officer of Health (MOH) Offices and two clinics were visited by each of the teams to:

1. Check current vaccine management situation against EVSM indicators at national and sub national levels.

2. Calculate percentage weight-age for each of the EVSM indicators (through the software inbuilt in WHO/EVSM) against standard programme requirements.

3. Ascertain shortcomings and providing recommendations against each of the EVSM indicators.

The Vaccine Management Assessment (VMA) tool is developed by the WHO Global Training Network on Vaccine Management (GTN/VM) team to help countries to improve the quality of their vaccine management down to the service delivery level. The purpose of the VMA is to investigate vaccine management knowledge and practices amongst health staff operating at national, sub-national and service delivery levels. It bases itself on the data and practices recorded over the last six months. The tool helps assessors to identify and document major knowledge and performance gaps in a consistent format. Targeted technical support and training can then be provided to overcome these deficiencies. The assessment will also help to identify areas of strengths and weaknesses.

The minimum requirement for certification of good management was 80%. This assessment revealed that while certain aspects of the vaccine management are satisfactory some areas require more attention and improvement (Box 1 and 2).

The vaccine is promptly cleared from the airport on arrival in the country. This is essential in maintaining the cold chain. Although this occurs without any interruption, signing a Memorandum of Understanding (MOU) between the Ministry of Health and the Customs has been recommended by the evaluation team. Although the staff involved is aware of the contingency measures regarding the maintenance of correct storage temperature, a proper contingency plan is not in paper format. This also has been recommended by the team. The main reasons for the low rating of buildings, equipment and transport indicator is the fact that cold rooms are scattered in several locations thereby making close supervision difficult. The other reason is that most of these cold rooms are very old and use CFC. It is recommended that all cold/freezer rooms, refrigerators/freezers with the programme should be converted to CFC free refrigerant units whenever these are broken down. The need to give priority to the completion of the new cold storage stores which is currently under construction is also emphasized as this will bring together the scattered cold storage facilities.

2. Sub national level scores as per EVSM questionnaire

indicator	District	MOH	Average
Vaccine storage temperature	81.3	73.0	77.2
Cold store capacity	62.7	80.0	71.3
Building, cold chain equipment and transport	72.0	73.6	72.8
Maintenance of cold chain equipment and transport	83.3	78.2	80.8
Stock management	43.0	40.8	41.9
Effective vaccine delivery	66.3	76.6	71.5
Correct diluents use of freeze dried vaccines*	50.0	55.0	52.5
Effective VVM use	86.3	72.8	79.6
Multi-dose policy	66.7	100.0	83.3
Vaccine wastage control	16.7	75.0	45.8

** The low rating for the indicator 'Correct diluents use of freeze dried vaccines' scored only 52.5% on average in the sub national level was due to the receipt and issue of vaccine diluents are not recorded anywhere. Therefore, in certain instances, the vaccine stocks were not tallied with vaccine diluents stocks. Proper documentation and distribution of vaccine diluents at all levels of vaccine distribution also has been recommended.*

For an effective stock management, a computerized stock control system at the national level is recommended in place of the existing manual recording. Training on knowledge of maximum and minimum stock levels, calculation of stock requirements, and physical verification of stocks will improve stock management at the district and MOH levels.

Colour changes in Vaccine Cold Chain Monitors (VCCM) and Vaccine Vial Monitors (VVM) are currently used as the guide in cold chain monitoring. However, this only provides information on cumulative exposure to heat and does not provide a clear picture about temperature fluctuations or exposure to extreme cold. Therefore, the use of digital temperature monitoring systems – 'Tiny Talks' are recommended for regular monitoring of temperature during vaccine distribution. The

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

05th - 11th November 2005 (45th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	01 MT=1	00	00	01 AP=1	00	00	02	02	88	86	+02.3%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	01 NE=1	00	00	00	00	00	00	01	00	46	71	-35.2%
Tetanus	00	00	00	00	00	01 AP=1	00	00	01	00	31	40	-22.5%
Whooping Cough	00	00	00	00	00	00	00	02 RP=1KG=1	02	03	104	43	+141.9%
Tuberculosis	75	29	26	18	25	00	00	03	176	139	8621	7808	+10.4%

Table 2: Diseases under Special Surveillance

05th - 11th November 2005 (45th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	60	18	06	00	04	01	02	19	110	91	4606	14286	-67.8%
Encephalitis	00	01 KD=1	00	00	00	00	00	01 RP=1	02	03	53	90	-41.1%
Human Rabies	01 CB=1	00	00	00	00	00	00	01 RP=1	02	02	49	87	-43.7%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.; **NA**= Not Available

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

need for routine vaccine management procedures in place to be translated into Standard Operating Procedures (SOP) format also has been highlighted.

Recommendations are also made to improve service delivery at the sub national levels (at district and at MOOH). Improving knowledge - especially training of store keepers on the issue and proper storage of vaccine in the refrigerators is recommended. Temperature monitoring in the freezer compartments and also use of Freeze Watch equipments to safeguard freeze sensitive vaccines are also recommended. It also recommended to arrange for temperature recording on holidays or introducing automatic recording devices.

Depending on recommendations made, the Epidemiology Unit has taken several measures to improve the vaccine management. The SOP on vaccine management has been drafted in English and will be translated into Sinhala and Tamil. This will be available for use by 2006. Tiny Talk equipment for cold chain monitoring also has been acquired and will be in use very soon. Staff development by training all categories of staff involved in vaccine management also has been strengthened in the line of recommendations. A new vaccine storage complex is now under construction and will soon be available to accommodate all cold rooms under the same roof.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

05th - 11th November 2005 (45th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	30	1620	07	252	00	00	02	54	01	113	07	128	00	04	02	98	62
Gampaha	20	1067	09	257	00	02	01	60	01	62	04	203	00	03	03	124	79
Kalutara	10	272	02	424	00	00	00	43	00	90	02	90	00	02	00	34	50
Kandy	18	437	12	389	01	03	02	115	02	27	02	48	02	68	01	85	73
Matale	00	44	10	302	00	02	00	23	02	28	00	34	00	00	01	13	67
Nuwara Eliya	00	15	00	284	00	00	02	186	00	290	00	10	00	23	04	27	86
Galle	00	69	00	128	00	04	01	15	00	21	01	77	00	08	00	09	50
Hambantota	01	34	01	247	00	01	00	08	00	41	00	40	00	69	00	15	80
Matara	05	108	02	177	00	02	00	32	00	30	04	141	01	123	00	11	93
Jaffna	00	11	04	158	00	01	01	290	01	20	00	01	00	86	01	71	38
Kilinochchi	00	02	04	39	00	00	00	08	00	27	00	00	00	00	00	06	50
Mannar	00	00	00	31	00	00	00	54	00	25	00	00	00	01	00	16	83
Vavuniya	00	23	01	119	00	03	01	195	01	21	00	02	00	00	01	10	75
Mullaitivu	00	00	00	14	00	00	00	24	00	02	00	00	00	03	00	09	00
Batticaloa	00	03	03	38	00	02	00	07	00	03	00	02	00	05	02	280	44
Ampara	00	10	00	109	00	00	00	05	00	10	00	13	00	00	01	33	14
Trincomalee	00	45	04	307	00	00	01	39	00	38	00	06	00	03	03	158	67
Kurunegala	04	93	21	406	00	02	01	66	10	45	02	19	01	12	00	63	76
Puttalam	00	105	31	138	00	03	00	159	02	07	01	24	00	01	00	42	44
Anuradhapura	00	85	12	164	00	02	00	24	00	105	01	75	00	17	00	44	53
Polonnaruwa	01	47	10	62	00	00	01	76	00	05	00	19	00	02	04	22	86
Badulla	02	35	09	590	00	00	01	190	00	27	01	64	06	97	01	169	60
Monaragala	00	11	07	178	00	01	03	58	00	19	00	88	02	97	04	88	70
Ratnapura	19	355	18	578	01	20	02	271	01	22	04	82	00	11	03	76	87
Kegalle	00	111	02	329	00	02	00	34	00	11	02	117	03	42	01	89	60
Kalmunai	00	04	00	73	00	03	00	23	00	01	00	00	00	03	10	256	09
SRI LANKA	110	4606	169	5793	02	53	19	2059	21	1090	31	1283	15	680	42	1848	63

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 19th November 2005 :Total number of reporting units = 279.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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SRI LANKA - 2005
WER

Floods: On Your Guard

Sri Lanka had experienced heavy torrential rains during the past weeks resulting in widespread flooding in at least ten districts. An estimated number of 30,000 families were affected and some 2,000 homes have been damaged or destroyed. Several deaths were also reported due to drowning and other injuries. A non-stop 24-hour spell of rain from 21st to 22nd November caused considerable havoc across the country particularly in the Western, Sabaragamuwa, Northern & Eastern Provinces. Although water levels have fallen in most affected areas, rainy weather may continue and it is needed to continue to assess flood damage and the risk of communicable diseases and take corrective and preventive measures to minimize after effects.

Even in areas where flood is not experienced, there could be an adverse impact on public health due to contamination of drinking water sources by over flowed septic tanks or other ground contaminants and due to pooling of water in fields and gardens. The major concern associated with floods is the spread of communicable diseases. During and immediately after floods, dysentery and other diarrhoeal diseases, viral hepatitis, enteric fever and leptospirosis could be on the increase. Once the flooded water subsided, existing water puddles and other collections of water would be an ideal environment for vectors like mosquitoes to breed resulting in outbreaks of dengue fever, malaria and filariasis.

Encountering problems associated with floods is a multi-disciplinary activity where the Medical Officer of Health (MOH) has a key role to play. All primary health care workers should be in action as a team. An Emergency Action Committee of the region should be formulated if there isn't one already. The MOH, Divisional Secretary, Chairman of the Local Government, Grama Niladharis, Officer-in-charge of the Police Station and other area leaders will comprise an ideal Emergency Action Committee. With the help of other committee members, the MOH should take responsibility for the health of the victims of floods and other residents in the affected areas.

MOH has to organize a health team to carry out health activities in the affected areas. A proper coordination with other governmental and non-governmental organizations and health volunteers is essential. The area PHI should be the leader of the local team. He has the responsibility of coordinating other health care personnel and health volunteers.

During floods special emphasis should be given to safe water and food supplies to all victims. People should be encouraged to consume boiled cooled water all the time. Being displaced by floods, if people are in temporary shelters, supply of safe water for mass consumption would be required. In such a situation chlorination of water would be a convenient and effective alternative to boiling water. In addition, a large amount of clean water would be necessary for other requirements. Initially, the supply of precooked food would be necessary. Although primary health care staff would have a little con-

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trol of such supplies maximum effort should be taken to ensure a supply of hygienically prepared food. During the subsequent days, they should use the opportunity in safe food delivery. All food should be properly cooked before consumption. Raw vegetables and leafy vegetables should be avoided. Fruits should be washed thoroughly with clean, treated water and peeled before consumption. Public should be educated on the importance of these safe practices.

Any food contaminated with flood water should be discarded. Canned food may be used provided they are not bulging, opened or damaged. However, the container should be thoroughly washed with treated water before opening.

Nutrition of infants and children, pregnant mothers, the old and sick should receive priority. Public Health Nursing Sisters and Public Health Midwives can greatly contribute in educating and supervising these practices.

Hand hygiene should also receive proper attention. They should always wash hands with soap and water before preparing or eating food, after toilet use, after participating in flood cleanup activities, and after handling articles contaminated with flood water or sewage. Support and supervision by the primary health care staff would be very important since people who had good hygienic practices may also tend to practice risk behaviours in difficult situations.

Safe disposal of excreta is also extremely important. People should be encouraged to use latrines for the purpose. If latrines are submerged with water, an alternative latrine located in a higher elevation should always be chosen. Construction of temporary latrines may be necessary and MOOH and PHII should take the initiative with the help of the Local Government authorities.

Once the flood water has receded, all houses including latrines should be thoroughly cleaned. Tropical chloride of lime (TCL) can be used as a disinfectant. If dead animals are around they should be buried. There could be heaps of garbage washed in with flood water and trapped among trees, fences and even inside of houses. They should be cleared. Removal by the local government authorities for proper disposal would be convenient to the public. However, this would not be practical all the time. Burial in a deep pit would be the alternative.

Collection of water in receptacles as well as pooling of water in pits would be the next hazard. This will persist for weeks and will be reinforced by scattered showers which usually follows heavy rains. These are ideal breeding places for mosquitoes. There is a definite increase in the risk of spreading mosquito borne diseases such as dengue fever, malaria and filariasis, depending on the area affected. In addition, there would be the nuisance due to other mosquito species. MOH and PHII have to take a personnel interest to look into this matter. Cleaning of the environment should be continued until this threat is satisfactorily controlled. Priority should be given to physical cleaning of the environment. Use of chemical methods for example, spraying larvicides is not recommended as the sole remedy and should only be a supplementation to the cleaning of the environment.

The other most important aspect that primary health care staff should focus their attention is the disease surveillance. With the disruption of routine activities in an emergency condition, routine notification would be incomplete. In addition most of the victims would be treated out of the health system

(Continued on page 3)

Management of patients with bloody diarrhoea

The most common cause for bloody diarrhoea is shigellosis. All such cases should be treated promptly and need antimicrobial therapy. Therefore all cases with bloody diarrhoea should be referred to a health facility where treatment is available. This lessens the risk of serious complications and death, shortens the duration of symptoms, and hastens the elimination of *Shigella* from the stool. Other supportive measures used to treat acute diarrhoea, such as rehydration, and feeding should also be provided. Symptomatic treatment should be given for fever and pain. These patients should be monitored regularly to assess the improvement of the condition. Important signs of improvement are less fever, less blood in the stool, less frequent stools and improved appetite.

A medical officer should prescribe antimicrobials. The choice of antimicrobial should, if possible, be based in recent susceptibility data from Shigella strains isolated in the area.

Bloody diarrhoea is sometimes associated with dehydration owing to the loss of water and electrolytes. The patient's state of hydration should be accurately and regularly assessed. Oral rehydration will correct or prevent dehydration in most patients and will thus, avoid the need for intravenous therapy. All oral fluids, including ORS solution, should be prepared with the best available drinking water and stored safely. Only a small proportion of patients require intravenous rehydration, usually at the beginning of the treatment. ORS solution should be given as soon as they can drink, even before intravenous therapy has been stopped.

Continued feeding is imperative for all patients with bloody diarrhoea to accelerate recovery, and to prevent hypoglycaemia and malnutrition. Frequent small meals with familiar foods, rich in energy and protein, should be provided. Children should be fed at least every four hours. Infants and children who breastfeed should continue to be breastfed as often and for as long as they want. Initially, food may be refused and nasogastic or intravenous administration of fluids may be required, but appetite usually improves after one to two days. Young children convalescing from bloody diarrhoea should be given an extra meal each day for at least two weeks to help them recover any weight lost during the illness.

Fever should be controlled with anti-pyretic drugs. This decreases the risk of convulsions and improves appetite. Paracetamol is the treatment of choice and its analgesic effect is also beneficial.

Table 1: Vaccine-preventable diseases & AFP

12th - 18th November 2005 (46th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	02 CB=1KL=1	00	01 GL=1	00	00	01 AP=1	00	00	04	02	92	88	+04.5%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	00	00	00	00	00	00	00	00	00	46	71	-35.2%
Tetanus	00	00	00	00	00	00	01 BD=1	00	01	00	32	40	-20.0%
Whooping Cough	00	00	00	00	00	00	00	00	00	00	104	43	+141.9%
Tuberculosis	01	49	00	07	00	41	14	16	128	48	8749	7856	+11.4%

Table 2: Diseases under Special Surveillance

12th - 18th November 2005 (46th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	49	07	08	00	01	07	00	03	75	99	4696	14418	-67.4%
Encephalitis	00	00	00	00	00	00	00	00	00	00	53	90	-41.1%
Human Rabies	00	01 ML=1	00	00	01 KR=1	00	00	00	02	00	51	89	-42.7%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.; **NA**= Not Available

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

where the surveillance process is in operation. Therefore, Public Health Inspectors should do active case finding in affected areas. It also should be borne in mind that due to disruption of routine systems and damage to infrastructure, in addition to the poor notification these areas are more vulnerable to spread of communicable diseases than during a normal period.

Proper and prompt investigation of all suspected cases, should be coupled with activities to prevent further spread of diseases. Reporting to higher levels of authority should also be prompt. This will provide much needed information to assess the overall situation and to make decisions for a proper control.

Documentation of all activities carried out, problems encountered, means overcome should be followed by the end of emergency response. This will provide information for a practical solution in future emergencies.

Source:

World Health Organization. Guidelines for the control of shigellosis, including epidemics due to *Shigella dysenteriae* type 1. WHO 2005.

Available at: http://www.who.int/topics/cholera/publications/shigellosis/en/index.html

Table 3: Selected notifiable diseases reported by Medical Officers of Health

12th - 18th November 2005 (46th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	33	1655	08	260	00	00	00	54	00	113	04	135	00	04	01	99	77
Gampaha	07	1075	03	269	00	02	00	60	00	62	02	206	00	03	00	124	86
Kalutara	09	283	00	430	00	00	00	43	00	91	00	90	00	02	01	35	90
Kandy	06	445	04	395	00	02	02	118	01	28	00	48	00	68	05	90	59
Matale	01	45	36	338	00	02	00	23	02	30	01	35	00	00	00	13	75
Nuwara Eliya	00	15	02	289	00	00	04	192	00	290	00	10	00	23	00	27	86
Galle	03	72	05	133	00	04	00	15	02	23	01	78	00	08	00	09	75
Hambantota	00	35	01	250	00	01	01	09	00	41	00	40	00	70	00	15	80
Matara	05	113	05	182	00	02	00	32	00	30	01	142	01	124	00	11	100
Jaffna	00	11	00	166	00	02	00	291	00	20	00	01	00	86	01	75	88
Kilinochchi	00	02	00	45	00	00	00	08	00	27	00	00	00	00	00	06	50
Mannar	00	00	10	41	00	00	00	54	00	25	00	00	00	01	00	16	83
Vavuniya	00	23	10	129	00	03	00	195	02	23	00	02	00	00	00	10	100
Mullaitivu	00	00	00	18	00	00	00	26	00	02	00	00	00	03	01	11	100
Batticaloa	00	03	00	38	00	02	00	07	00	03	00	02	00	05	01	281	44
Ampara	00	10	00	116	00	00	00	05	00	10	01	14	00	01	00	39	29
Trincomalee	00	45	08	320	00	00	01	40	00	38	00	06	00	03	01	160	67
Kurunegala	01	94	31	438	00	02	00	66	00	45	02	21	00	12	00	63	82
Puttalam	00	108	36	191	00	03	00	163	00	07	00	24	00	01	01	45	56
Anuradhapura	07	92	06	177	00	02	00	24	00	105	00	75	00	17	00	44	68
Polonnaruwa	00	49	00	62	00	00	00	76	02	07	00	19	00	02	01	23	86
Badulla	00	35	04	597	00	00	00	190	00	30	00	64	00	97	03	172	60
Monaragala	00	11	10	189	00	01	02	60	02	21	00	88	03	102	01	91	80
Ratnapura	02	357	08	587	00	20	01	272	00	22	00	83	00	11	00	79	73
Kegalle	01	114	03	336	00	02	01	35	00	11	04	121	01	43	01	92	60
Kalmunai	00	04	00	76	00	03	00	26	00	01	00	00	00	03	01	269	18
SRI LANKA	75	4696	190	6072	00	53	12	2084	11	1105	16	1304	05	689	19	1899	71

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 26th November 2005 :Total number of reporting units = 279.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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AFP Surveillance - Revisited

Polio is a crippling disease in childhood and possesses an age-old history that extends as far as the early stages of human civilization. This was endemic in all five continents until late 1980s. Due to successful immunization programmes, poliomyelitis is now concentrated only in some parts of sub-Saharan Africa and South Asia. Presently, the world is geared for global eradication of wild poliovirus. This is an achievable target since the polio virus is unable to survive outside the human body for longer period and because inexpensive, very effective two vaccines are available against the virus. Furthermore, there is no evidence for a persistent wild poliovirus carrier state. There are no animal or insect reservoirs as well.

Supported by all these evidences, a global initiative to eradicate polio by the end of the year 2000 was launched at the 41st World Health Assembly in 1988. Although the achievements are lagging behind the targets, results are promising. This is proven by the drastic reduction of the global polio caseload from an estimated 350,000 cases in 1988 to 1255 in 2004.

Having very receptive community with a good faith in the country's immunization programme and the commitment of the health care staff, Sri Lanka had achieved a very high coverage of childhood immunization. The results are encouraging; there have been no wild polio virus victims in Sri Lanka since the last case was reported in 1993. However, several South Asian countries are still reporting polio cases and our neighbouring country – India is polio endemic. Therefore there is a risk of polio importation to Sri Lanka and a thorough vigilance is needed to curtail this problem. This will be the best contribution the country can offer to the global initiative of polio eradication. Such an exercise will be rewarded back by the World Health Organization's certification of Sri Lanka as a polio free country. This should be achieved through the surveillance of acute flaccid paralysis (AFP). Because paralytic poliomyelitis is one cause of AFP, regardless of the diagnosis, all AFP cases should be reported. Maintaining a high sensitivity of AFP reporting will ensure that every case of paralytic poliomyelitis is detected early, reported, and investigated promptly, resulting in preventive & control measures to interrupt transmission of disease. Historically, poliomyelitis has often been referred to as infantile paralysis. Only occasionally, poliomyelitis may occur in older children. Therefore, AFP surveillance is focused on children aged <15 years.

Experience in other parts of the world indicates that at least 1 case of non-polio AFP occurs for every 100,000 population children aged <15 years per year. This is referred to as the "background" rate of AFP among children. The other non-polio causes of AFP, such as Guillain-Barre Syndrome account for this background rate, regardless of whether acute poliomyelitis exists in the community.

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Guidelines for the Preparedness and Response to an Avian Influenza Pandemic Threat -(General Circular No: 02-164/ 2005) is available on line.

Visit: http://www.epid.gov.lk/pdf/AI%20circular%202005.pdf

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Prompt notification of all AFP cases to the surveillance network is everybody's responsibility. The community should be made aware what AFP means and the importance of its notification to the health care system. However, in an instance where a child is paralyzed, he/she will promptly be taken to a hospital irrespective of the family's social status and which part of the country they reside. Therefore, detection of the nearly the total caseload of AFP can be done at hospital level. Even more, these cases will end up in institutions where Consultant care is available. Therefore, surveillance of medical facilities where Consultant Paediatricians, Consultant Physicians and Consultant Neurologists are available will detect the targeted AFP cases. At present, the Regional Epidemiologist (RE) visits medical facilities in the area where a Consultant Paediatrician or a Consultant Neurologist practices and actively detects all cases with AFP. In addition, it is the duty of the Consultant and his team of Medical Officers to notify such cases to the RE/Deputy Provincial Director of Health Services or to the Epidemiologist of the Epidemiology Unit.

The hospital staff is responsible for stool sampling of the child. Assuming the child as a case of poliomyelitis, the out break response at the field level should be done by the MOH of the area where the child resides. Examination of stools samples for virology should be done at a WHO accredited reference laboratory. The Medical Research Institute is the only such facility in Sri Lanka.

Isolation of wild poliovirus from stools is the best way to confirm the diagnosis of paralytic poliomyelitis. Virus usually can be found in the faeces from 72 hours to up to 8 or more weeks after infection, with the highest probability during the first 2 weeks. For all AFP cases, two specimens should be collected within 2 weeks after the onset of paralysis, 24 to 48 hours apart. The goal to collect specimens within two weeks of the onset of paralysis is important because virus excretion diminishes with time resulting in a reduction of the sensitivity of poliovirus detection. Even when a case of AFP is seen late in the field, stool specimens should be collected irrespective of the date of onset. However, the chances of finding poliovirus in the stool 60 days after the onset of paralysis is extremely remote. It should be noted that with a functioning and sensitive surveillance system for AFP, late detection of AFP cases indicates surveillance failure.

Specimens must arrive at the laboratory in good condition with ice which has not melted completely during transport. If specimens arrive with no ice, then the criteria for transport of specimens will not have been met. If wild poliovirus is present in the stool, its identification will be impossible if temperatures are not maintained in transport, requiring the maintenance of the cold chain. "Adequate specimens" can be defined as 2 specimens, at least 24 hours apart, collected within 14 days of paralysis onset; each of adequate volume (8-10 g) and arriving at a WHO accredited laboratory in good condition. "Good condition" means no desiccation, or leakage of faeces,

(Continued on page 3)

Role of RE in AFP surveillance

- RE should do active surveillance for AFP cases by visiting all hospitals in the area where a Consultant Paediatrician, a Consultant Physician or a Consultant Neurologist is available.
- In case of detection of AFP cases if not notified yet it should be notified to the Epidemiology Unit and to the MOH of the area where the child resides.
- All the AFP cases should be examined by RE on or around 60 days of the onset of paralysis to check for any residual paralysis and Form 3 (EPID/37/3/R 2004) should be completed and sent to the Epidemiology. Unit.

Role of the MOH on AFP Surveillance

Investigation

On receipt of notification of an AFP case the MOH should record it in the AFP register and investigate the case personally as soon as possible but not later than 72 hours of notification. On receipt of the yellow form (EPID/37/2/R 2004) from the Epidemiology Unit the form must be completed and returned to the Epidemiologist, with a copy to the RE within a one week of notification.

Outbreak response

This should be prompt and immediately after notification of the case.

- Visit the community where the case is resident with the area PHI and PHM.
- Inform the parents of the case and the community that this is an AFP case, which may be due to many causes one of which is poliomyelitis and the importance of investigating such cases to specially eliminate poliomyelitis as the cause.
- Meet the parents of the case and inquire whether the patient had travelled out of the area within 28 days before the onset of paralysis. Enter any positive finding in the remarks column of yellow form (EPID/37/2/R 2004).
- Obtain the immunization history of the child including any extra doses of OPV received.
- Inquire from the parents whether any person in the house had received OPV during the 28 days before onset of paralysis. This is important if the poliovirus is isolated from the sample of stools to differentiate whether it is the vaccine virus or the wild poliovirus. Enter any positive findings in the remarks column of form (EPID/37/2/R 2004).
- Find out whether there are any other children in the family or in the vicinity with paralysis of recent onset.

Collection and transport of samples of stools from contacts

One sample each from 3-5 immediate contacts should be collected. Even in late notifications, this have to be done. Immediate contacts are siblings, playmates and classmates.

- Request parents of immediate contacts, to make samples of stools of the contacts available for collection the following day.
- The quantity of the sample should be 8-10 grams or the size of two thumbnails or two tamarind seeds.
- Samples should be collected in to clean dry screw-capped bottles and correctly labelled.
- Container should be packed in ice during transport.
- Lid of the container should be tightly closed to prevent leaking and drying of sample
- MOH should arrange transport to send the specimens to the MRI within 72 hours of collection.
- If samples have not been collected the following day, they should be collected as early as possible.

Immunization of contacts

- One dose of OPV should be given irrespective of the immunization status of the children living within a 2 km radius of the AFP case and under the age of the AFP case. The number of children immunized should be limited to about 250-300.
- Should be careful not to create unnecessary panic in the community.
- Message should never be given through mass media and public addressing systems should not be used for outbreak response activities.

Other polio control activities at MOH level

Immunization of immigrants

- All immigrants under 15 years of age from South India and internal immigrants from Northern and Eastern Province of Sri Lanka should be given two extra doses of OPV upon arrival with a 6-8 weeks interval.
- Public Health Midwives should o keep a register about the returnees from South India and a consolidated return should be sent to the RE monthly.

Table 1: Vaccine-preventable diseases & AFP

19th - 25th November 2005 (47th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	01 KD=1	00	00	00	00	00	00	01	01	93	89	+04.5%
Diphtheria	00	00	00	01 KN=1	00	00	00	00	01	00	02	01	+100.0%
Measles	00	00	00	00	00	00	00	01 RP=1	01	01	47	72	-34.7%
Tetanus	00	00	00	00	00	00	00	00	00	00	32	40	-20.0%
Whooping Cough	00	00	03 MT=3	00	00	00	00	00	03	01	107	44	+143.2%
Tuberculosis	57	00	11	55	20	00	00	41	184	237	8933	8093	+10.4%

Table 2: Diseases under Special Surveillance

19th - 25th November 2005 (47th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	59	24	17	01	09	02	11	10	133	87	4856	14532	-66.6%
Encephalitis	01 GM=1	02 KD=2	00	00	00	00	00	00	03	02	56	92	-39.1%
Human Rabies	00	00	00	00	00	00	00	00	00	02	51	91	-44.0%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.; **NA**= Not Available

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

adequate documentation and evidence that the cold chain was maintained. All specimen containers must be clearly labelled. A specimen carrier or vaccine carrier with frozen ice packs can be used for this purpose. If a vaccine carrier is used, it should be marked properly to avoid the risk of its being mixed with other vaccine carriers used for the transportation of vaccines. The vaccine carriers used to transport stool specimens should never be used to transport vaccines. Ideally, all stool specimens should be sent to the laboratory the day they are collected.

Programme Surveillance Indicators: Targets & Achievements – 2004

Indicator	Target	Achievement
Rate of AFP due to causes other than poliomyelitis (non-poliomyelitis AFP rate) in children under 15 years of age	1/ 100 000	1.9/ 100 000
Timeliness of weekly reporting	≥80%	86%
Reported AFP cases investigated within 48 hours of report	≥80%	100%
Reported AFP cases with 2 stools specimens collected within 14 days of onset	≥80%	86%
Reported AFP cases with a follow-up examination at 60 days after onset of paralysis to verify presence of residual paralysis or weakness	≥80%	100%
Specimens arriving at the National Laboratory (MRI) within 3 days of collection	≥80%	100%
Specimens arriving at laboratory in "good condition"	≥80%	97%
Virology test results be available within 28 days	≥80%	100%
Stool samples non-polio entero-virus was isolated	≥10%	08%

Table 3: Selected notifiable diseases reported by Medical Officers of Health

19th - 25th November 2005 (47th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	36	1694	07	268	00	00	01	56	01	114	01	138	00	04	01	100	62
Gampaha	08	1089	12	283	01	03	01	61	00	62	02	208	00	03	02	127	64
Kalutara	15	298	09	439	00	00	01	44	00	91	01	91	01	03	02	37	100
Kandy	19	470	14	411	02	04	05	123	01	31	04	52	01	71	01	92	77
Matale	03	48	21	360	00	02	02	25	00	30	00	36	00	00	01	14	75
Nuwara Eliya	02	17	05	294	00	00	02	194	00	290	00	10	00	23	02	29	71
Galle	04	77	03	137	00	04	02	17	00	23	00	78	00	08	00	09	69
Hambantota	01	36	04	254	00	01	00	09	04	45	00	40	00	70	00	15	90
Matara	12	126	08	190	00	02	02	34	01	31	07	149	03	127	01	12	93
Jaffna	00	11	03	169	00	02	02	293	00	20	00	01	00	86	03	78	50
Kilinochchi	00	03	00	48	00	00	01	10	00	27	00	00	00	00	00	06	75
Mannar	00	00	00	41	00	00	00	54	00	25	00	00	00	01	00	16	00
Vavuniya	00	23	19	148	00	03	01	196	00	23	00	02	00	00	01	11	75
Mullaitivu	00	00	00	18	00	00	00	26	00	02	00	00	00	03	02	13	100
Batticaloa	01	05	00	40	00	02	00	07	00	03	00	02	00	05	02	287	56
Ampara	00	10	00	117	00	00	00	05	00	10	00	14	00	01	00	41	43
Trincomalee	00	45	27	347	00	00	00	40	00	38	00	06	01	04	15	175	78
Kurunegala	07	101	87	526	00	02	00	66	00	45	00	21	00	12	02	65	82
Puttalam	02	112	25	216	00	03	00	163	00	07	00	24	00	01	00	46	67
Anuradhapura	02	94	19	197	00	02	01	25	00	105	00	75	00	17	00	44	58
Polonnaruwa	00	49	04	66	00	00	00	76	00	07	00	19	00	02	01	24	86
Badulla	11	49	16	617	00	00	03	194	00	30	00	64	01	99	05	178	80
Monaragala	00	11	04	199	00	01	05	65	00	21	00	88	01	103	03	94	100
Ratnapura	08	368	12	599	00	20	05	277	00	22	02	85	03	14	05	87	80
Kegalle	02	116	07	344	00	02	01	36	00	11	11	134	03	46	02	96	60
Kalmunai	00	04	03	79	00	03	01	27	00	01	00	00	00	03	07	278	36
SRI LANKA	133	4856	309	6407	03	56	36	2123	07	1114	28	1337	14	706	58	1974	71

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 03rd December 2005 :Total number of reporting units = 279.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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ON STATE SERVICE

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WEEKLY EPIDEMIOLOGICAL REPORT
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Vol. 32 No. 49 03rd - 09th December 2005

SRI LANKA - 2005
WER

Out in the field: looking for the disease

The global community is currently experiencing the largest and most severe avian influenza outbreak in the recorded history. Never before in the history of this disease have so many countries been simultaneously affected, resulting in the loss of so many birds. This disease has devastated the poultry industries in many Asian countries during early 2004.

Despite the death or destruction of an estimated 150 million birds, the causative virus H5N1 is now considered endemic in many parts of Indonesia and Viet Nam and in some parts of Cambodia, China, Thailand, and possibly also the Lao People's Democratic Republic. Control of the disease in poultry is expected to take several years.

Since its beginning in South-East Asian region in mid 2003, through early February 2004, poultry outbreaks caused by the H5N1 virus have been reported in eight Asian nations: the Republic of Korea, Viet Nam, Japan, Thailand, Cambodia, Lao People's Democratic Republic, Indonesia, and China. Most of these countries had never before experienced an outbreak of highly pathogenic avian influenza in their histories.

In early August 2004, Malaysia reported its first outbreak of H5N1 in poultry, becoming the ninth Asian nation affected. Russia reported its first H5N1 outbreak in poultry in late July 2005, followed by reports of disease in adjacent parts of Kazakhstan in early August. Deaths of wild birds from highly pathogenic H5N1 were reported in both countries. Almost simultaneously, Mongolia reported the detection of H5N1 in dead migratory birds. In October 2005, H5N1 was confirmed in poultry in Turkey and Romania.

Japan, the Republic of Korea, and Malaysia have announced control of their poultry outbreaks and are now considered free of the disease. In the other affected areas, outbreaks are continuing with varying degrees of severity.

Several affected countries have reported human infection with a high mortality. Direct contact with infected poultry, or surfaces and objects contaminated by their faeces, is presently considered the main routes of human infection. To date, most human cases have occurred in rural or peri-urban areas where many households keep small poultry flocks, which often roam freely, sometimes entering homes or sharing outdoor areas where children play. As infected birds shed large quantities of virus in their faeces, opportunities for exposure to infected droppings or to environments contaminated by the virus are abundant under such conditions. Moreover, because many households in Asia depend on poultry for income and food, many families sell or slaughter and consume birds when signs of illness appear in a flock, and this practice has proved difficult to be changed. Exposure is considered most likely during slaughter, defeathering, butchering, and preparation of poultry for cooking.

Domestic ducks can now excrete large quantities of highly pathogenic virus without showing signs of illness, and are now acting as a "silent" reservoir of the virus, perpetuating transmis-

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sion to other birds. This adds yet another layer of complexity to control efforts and removes the warning signal for humans to avoid risky behaviours.

The role of migratory birds in the spread of highly pathogenic avian influenza is not fully understood. Wild waterfowl are considered the natural reservoir of all influenza A viruses. They have probably carried influenza viruses, with no apparent harm, for centuries. They are known to carry viruses of the H5 and H7 subtypes, but usually in the low pathogenic form. Considerable circumstantial evidence suggests that migratory birds can introduce low pathogenic H5 and H7 viruses to poultry flocks, which then mutate to the highly pathogenic form.

The behaviour of the virus in its natural reservoir, wild waterfowl, may be changing. The spring 2005 die-off of upwards of 6,000 migratory birds at a nature reserve in central China, caused by highly pathogenic H5N1, was highly unusual and probably unprecedented. In the past, only two large die-offs in migratory birds, caused by highly pathogenic viruses, are known to have occurred: in South Africa in 1961 (H5N3) and in Hong Kong in the winter of 2002–2003 (H5N1).

Recent events make it likely that some migratory birds are now directly spreading the H5N1 virus in its highly pathogenic form. Further spread to new areas is expected. No one knows with certainty whether a pandemic can be prevented. The best way to prevent a pandemic would be to eliminate the virus from birds, but it has become increasingly doubtful if this can be achieved within the near future.

So far there is no evidence that HPAI has been introduced into Sri Lanka. However the risk will exist as long as the disease is completely brought under control in affected countries. Therefore, the awareness and alert is necessary for early identification of the disease in case of being imported to the country. The Government of Sri Lanka has already initiated an emergency preparedness plan in the event of detection of HPAI infection among birds or humans. Since the media has given due prominence to the risk of the pandemic, the public also are concerned about the infection. Reported deaths in few numbers among birds during the recent past in several parts of the country have gained a wider public attention.

The health status of poultry farms and population with emphasis on sudden onset of high mortality has to be monitored for an early detection of an outbreak. If the mortality rate is more than 5% at any one time, it is considered as an emergency. In addition, wild life infectious disease is under surveillance in semi-urban areas and in remote rural areas. This may provide valuable information for early warning on diseases circulation in the wild prior to livestock outbreaks.

If there are any suspicious deaths or disease among birds the owner of the farm or the Veterinary Surgeon should report the incident to the Provincial Director of the Department of Animal Production and Health or to the Veterinary Research Institute, Gannoruwa (Tel: 081 22388195) or to the Molecular Medicine Unit of the Faculty of Medicine of the University of Kelaniya (Tel: 011 2960483). This will activate the field and laboratory investigation of the disease. The Veterinary Investigation Officer of the Province/District together with the field veterinarian will investigate the disease condition and take all measures to prevent the spread of the disease from the foci of infection. The investigation includes, examination of living birds, collection of pathological specimens from both living and moribund birds and laboratory confirmation of the disease.

The emergency prepared plan for HPAI developed by the Division of Animal Health of the Department of Animal Production and Health is available in the Epidemiology Unit web site (http://www.epid.gov.lk/Disease%20Situations.htm).

Identifying avian influenza in birds

Influenza A viruses may infect a wide range of domestic and wild bird species. Birds in the family Phasianidae - chickens, turkeys and related poultry such as quail, guinea fowl and pheasant – show severe disease when infected with highly pathogenic (HPAI) strains. Ducks may be infected and excrete HPAI virus with few if any clinical signs. Wild waterfowl and migratory sea birds are commonly infected with low pathogenicity strains (LPAI) in some parts of the world. They are believed to be a natural "reservoir" of viruses and the source of new strains. There is some evidence that pigeons are not infected with the H5 HPAI strains tested to date, although they may be moderately susceptible to some H7 strains.

In fully susceptible birds, infection with HPAI will probably be reported within a few days due to high mortality. However, LPAI infections may go unreported for some time.

HPAI viruses affect multiple organs. HPAI may result in the death of all the birds in the flock. Fully susceptible birds die very rapidly without previously showing signs of illness. When clinical signs are seen they may show a wide variation. The symptoms include a sudden decrease in the consumption of food or water; decrease or loss of egg laying; respiratory signs including sneezing, râles, excessive lacrimation, or sinusitis; oedema of the head and face, with subcutaneous haemorrhage and cyanosis of the skin, particularly of the head and wattles; diarrhoea, and occasionally neurological signs such as tremors or unusual posture of the head.

LPAI viruses cause a much milder disease consisting primarily of mild respiratory disease and depression. There are likely to be egg production problems in laying birds. Sometimes infections with other organisms or environmental conditions may cause exacerbation of LPAI infections leading to much more serious disease often with significant mortality: this occurs particularly in turkeys.

Mortality will depend on species and age of host, virulence of the virus strain, immune status, environmental conditions, and type of flock. In fully susceptible young chickens, infections with HPAI viruses may result in 100% flock mortality within days.

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP 26th November - 02nd December 2005 (48th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	00	00	00	00	01 PU=1	00	00	01 RP=1	02	01	95	90	+05.6%
Diphtheria	00	00	00	00	00	00	00	00	00	00	02	01	+100.0%
Measles	00	00	00	00	00	00	00	00	00	01	47	73	-35.6%
Tetanus	00	00	01 MT=1	00	00	00	00	00	01	00	33	40	-17.5%
Whooping Cough	00	00	00	00	00	00	00	00	00	01	110	46	+139.1%
Tuberculosis	23	32	29	19	00	04	00	11	118	82	9051	8175	+10.7%

Table 2: Diseases under Special Surveillance 26th November - 02nd December 2005 (48th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	62	20	15	01	08	13	07	10	136	107	5010	14685	-65.9%
Encephalitis	02 CB=2KL=1	02 KD=2	00	00	00	00	00	00	03	04	59	96	-38.5%
Human Rabies	00	00	00	01 JF=1	00	00	00	00	01	00	53	92	-42.4%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.; **NA**= Not Available

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

In the event of suspected human cases, it should be notified to the local Medical Officer of Health (MOH). It is the responsibility of the MOH to personally investigate reported cases with a view to carrying out preventive and control activities at the field level. A close collaboration with the divisional veterinary authorities and the regional health authorities namely, Deputy Provincial Director of Health Services and the Regional Epidemiologist is essential. In the event of such a situation, all MOH field staff, particularly the Public Health Inspectors should give priority to preventive and control activities.

At present the Infectious Disease Hospital (IDH), Angoda has been identified as the National Referral and Isolation Facility in the country and Lady Ridgeway Hospital for Children (LRH) for paediatric referrals. Eighteen other major hospitals have also been identified as sentinel surveillance and isolation sites. The General Circular in this regard is available at the Epidemiology Unit web site.

Source:

- The Department for Environment, Food and Rural Affairs UK Provisional disease profile for avian influenza (http://www.defra.gov.uk/animalh/diseases/vetsurveillance/profiles/ai-fullprofile.pdf)
- WHO. Avian Influenza (http://www.who.int/csr/disease/avian_influenza/en/)

Table 3: Selected notifiable diseases reported by Medical Officers of Health

26th November - 02nd December 2005 (48th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	32	1732	02	273	02	02	01	57	00	114	04	142	00	04	00	101	77
Gampaha	18	1114	11	304	00	03	00	63	00	62	01	210	00	03	00	127	79
Kalutara	12	310	05	444	01	01	03	47	00	91	04	95	00	03	00	37	60
Kandy	14	487	06	419	00	04	02	125	00	31	02	54	00	71	00	95	77
Matale	06	54	42	410	00	02	00	25	00	30	00	36	00	00	00	14	75
Nuwara Eliya	00	17	03	298	00	00	07	201	00	290	01	11	00	23	00	29	71
Galle	03	81	05	142	00	04	01	18	01	24	01	79	00	08	01	10	63
Hambantota	02	38	06	260	00	01	00	09	00	45	02	42	03	73	00	15	100
Matara	10	136	02	192	00	02	02	36	00	31	01	150	03	130	00	12	93
Jaffna	00	11	04	175	00	02	00	293	00	20	00	01	00	86	01	81	25
Kilinochchi	00	03	00	53	00	00	00	10	00	27	00	00	00	00	00	06	50
Mannar	00	00	00	41	00	00	00	54	00	25	00	00	00	01	00	16	17
Vavuniya	00	23	15	163	00	03	01	197	00	23	00	02	00	00	00	11	75
Mullaitivu	00	00	00	18	00	00	03	29	00	02	00	00	00	03	03	16	100
Batticaloa	00	05	00	40	00	02	00	07	00	03	00	02	00	05	12	300	44
Ampara	00	10	00	120	00	00	00	05	00	10	01	15	00	01	01	43	29
Trincomalee	01	46	06	353	00	00	01	41	00	38	00	06	00	04	09	187	56
Kurunegala	06	107	54	617	00	02	00	67	00	45	06	27	00	12	01	67	65
Puttalam	02	114	08	234	00	03	04	170	00	07	00	24	00	01	00	47	56
Anuradhapura	11	105	02	206	00	02	00	25	00	105	00	75	00	17	01	46	63
Polonnaruwa	02	51	03	72	00	00	00	76	00	07	00	19	00	02	01	25	86
Badulla	07	56	20	643	00	00	04	198	00	30	02	66	03	102	10	188	87
Monaragala	00	11	12	211	00	01	00	65	01	22	00	88	03	106	00	94	90
Ratnapura	09	378	16	615	00	20	02	280	00	22	02	89	01	15	02	89	93
Kegalle	01	117	09	355	00	02	01	37	00	11	14	151	01	47	00	96	100
Kalmunai	00	04	00	80	00	03	00	27	00	01	00	00	00	03	04	282	18
SRI LANKA	136	5010	231	6738	03	59	32	2162	02	1116	41	1384	14	720	46	2034	69

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 10th December 2005 :Total number of reporting units = 279.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WER SRI LANKA - 2005

Vol. 32 No. 50 10th - 16th December 2005

Expanding Horizons

Steps have been taken to add three new diseases - meningitis, chickenpox and mumps to the list of notifiable diseases in Sri Lanka. Out of these three, meningitis is the most important disease by means of severity and the sequeale of the disease. As well, a wide variety of microorganisms - bacteria, virus and fungi causes meningitis. *Neisseria meningitides*, *Streptococcus pneumoniae* and *Haemophilus influenzae* type b are responsible for most of the bacterial meningitis cases. These three organisms are responsible for almost 75% of all meningitis cases and 90% of bacterial meningitis in children. Another worry is the development of resistance to the commonly used antibiotics to treat meningitis, among causative bacteria. This has been reported from different parts of the world.

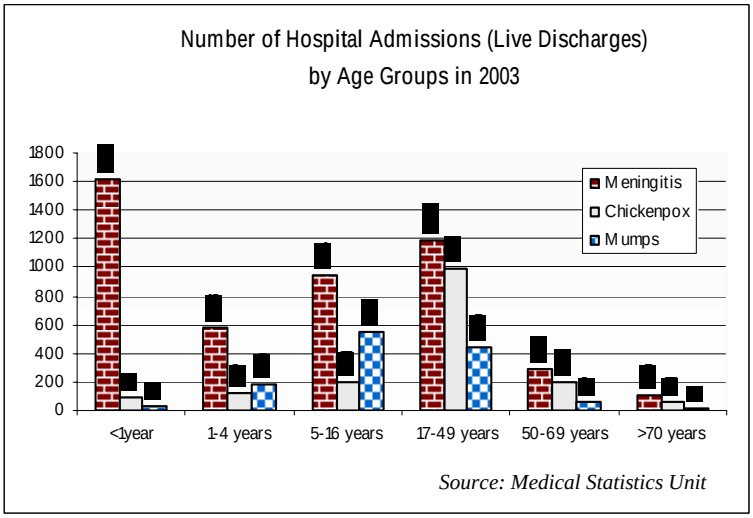
Many different viruses cause viral or aseptic meningitis. Enteroviruses, such as coxsackieviruses and echoviruses are the commonest. Herpes viruses and mumps virus can also cause viral meningitis. Viral meningitis can occur as epidemics or as sporadic cases. Meningitis due to fungi is rare. Immuno-compromised patients are the most vulnerable.

Meningitis surveillance data is important to understand the epidemiology and the burden of the disease. This also will be essential in directing future strategies of disease prevention and control. The indoor morbidity and mortality data reveals that there were 3146 bacterial and 1265 viral meningitis cases during 2003. Out of this, there were 158 bacterial and 23 viral meningitis deaths.

Even though chickenpox is a mild disease in children, it can cause complications in adults, pregnant women, neonates and immuno-compromised patients. Outbreaks can occur in schools and other institutional settings. Infection among pregnant mothers during the first trimester may rarely cause congenital malformation of the baby. Infection in the later stages of pregnancy predisposes to herpes zoster of the infant. Onset of chickenpox in the mother within 5 days to delivery and within 48 hours after delivery predisposes the newborn to severe neonatal infection and may be fatal.

Few outbreaks of chickenpox were reported from various parts of the country during the last few years. Available data suggests an

(Continued on page 2)



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increase of reported cases of chickenpox. According to the Indoor morbidity and mortality statistics in the year 2003 there were 1749 admissions with varicella (chickenpox) infection out of which 15 were fatal.

Mumps is an infection common in childhood. This often causes outbreaks in nurseries and schools. Infection with mumps virus can lead to acute complications such as aseptic meningitis, orchitis, pancreatitis and long term irreversible nerve deafness. Orchitis may lead to subfertility. Incidence data on mumps also is not available in Sri Lanka. In 2003, there were 1285 admissions to government hospitals one of which was fatal.

Surveillance case definitions

Meningitis

Fever of acute onset with one or more of the following signs of meningeal irreitation/infalmmation:
Neck stiffness; irritability; poor sucking (in infants); seizures; bulging fontanellaes (in infants); altered consciousness; other signs of meningeal irritation/ inflammation.

Chickenpox

An illness with acute onset of diffuse (generalized) papulovesicular and/ or vesiculopustular rash*, appearing on the trunk and face and then spreading to extremeties, without other apparent cause.
* In children only few vesicles may be present.

Mumps

An illness with acute onset of unilateral or bilateral tender, self-limited swelling of the parotid or other salivary gland, lasting more than or equal to two days, and without other apparent cause.

The major share of current notifications for all diseases comes from the admitted patients in the government hospitals. The three diseases added to the notifiable diseases list are not strange to the hospital staff and in fact commonly or uncommonly are encountered in hospital settings for a long period of time. Therefore, it may take some time to get used to these as notifiable diseases. To prevent a consequent poor notification rate at the beginning, every personnel in the surveillance network should take maximum interest and effort to notify all suspected cases of meningitis, chickenpox and mumps.

Meningitis is a disease severe enough to admit all patients to a hospital where specialist care is available. Therefore, concentrating on such hospitals will be able to detect almost all the cases with meningitis. Regional epidemiologists are already visiting these hospitals for surveillance of acute flaccid paralysis. This is a good opportunity to educate, remind and encourage the hospital staff to notify these cases. In addition , there would be a few meningitis cases in major private hospitals.

On the other hand, a larger proportion of cases of chickenpox and mumps are not severe enough to seek medical treatment. In addition, due to the cultural practices, many of these patients never seek medical attention and do confine themselves to their houses until the disease is cured. Unless there are complications, it is very rare to find these patients in a medical or paediatric ward. Therefore, the routine notification system would miss the majority of these patients.

There are two other instances where these patients may encounter the health system. One occasion would be the presentation to the Out Patients Departments (OPD), most often during the very early stages of the disease when the patient is unaware of the disease or unsure of the diagnosis. Symptoms and signs would vary from non-specific febrile illness to the typical disease. These cases would be diagnosed, treated and sent home by the attending physician at the OPD. The other occasion where these patients encounter the health care system is when the patient him/herself informs the Public Health Inspector or the Medical Officer of Health to obtain a Medical Certificate for absence from work.

Since hospital inpatient data of chickenpox and mumps reveals only a fraction of the burden of the disease, new strategies have to be developed to improve notification. One is the motivation to notify chickenpox and mumps cases when they are presented to the OPD of Government Hospitals. A similar number of patients may be visiting their family physicians. Therefore, General Practitioners should be encouraged to notify them to the relevant MOH.

The primary health care staff would be a very good source for detecting chickenpox and mumps. Since most of these patients are confined to their homes during the course of illness and it takes about one to two weeks to resolve the disease the primary health care staff will encounter these cases during their field visits. The MOH can motivate the field staff to report these cases actively .

The Public Health Inspector, during the field investigation of notified diseases look for similar cases among the family members and other associates. This also will reveal more cases among contacts of the patient. All these cases also should be investigated and reported to the MOH.

There is a higher chance to spread chickenpox and mumps in places like schools, pre-schools, day care centres and factories. Therefore, if the patient was attending any of these places, the PHI should visit these places to detect new cases and also to educate people and to provide guidance in curbing the spread of the disease. If this place is not with in his own area, the information can be passed to the relevant PHI through the MOH.

How to improve meningitis, chickenpox and mumps notification?

- RE to search suspected cases of meningitis during their active surveillance of AFP.
- Hospital staff to notify suspected cases of chickenpox and mumps seen at OPD.
- General Practitioners to notify suspected chickenpox and mumps cases.
- Field health staff to actively report new cases that come across during their field visits.
- PHI to investigate and notify new cases found during field investigation of notified cases.
- PHI to visit schools, factories or other institutions where patients were attending to find out more cases.

Table 1: Vaccine-preventable diseases & AFP

03rd - 09th December 2005 (49th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 KL=1	00	01 GL=1	00	00	01 AP=1	00	02 RP=2	05	00	100	90	11.1%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	00	00	00	00	00	00	00	00	01	47	75	-37.3%
Tetanus	00	00	01 MT=1	00	00	00	00	00	01	01	34	41	-17.1%
Whooping Cough	00	00	00	00	00	00	00	00	00	03	111	49	+126.5%
Tuberculosis	181	18	08	34	26	05	00	20	292	245	9343	8420	+11.0%

Table 2: Diseases under Special Surveillance

03rd - 09th December 2005 (49th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	86	27	13	01	13	23	05	09	177	135	5211	14850	-64.9%
Encephalitis	00	01 ML=1	00	00	00	00	00	00	01	02	60	99	-39.4%
Human Rabies	00	00	00	00	00	00	00	00	00	02	53	94	-43.6%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.; **NA**= Not Available

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

New Publications

SLMH - EPID 05/03

Guidelines on Clinical Management of Dengue Fever/ Dengue Haemorrhagic Fever

This guideline was prepared by the Sub Committee of Technical Experts on Clinical Management of Dengue Fever/ Dengue Haemorrhagic Fever with a view to assisting clinicians in proper management of patients.

This contains an overview on dengue fever and also sections on out patient and first contact management, management of dengue fever in the hospitalised patients, coordination of laboratory investigation for management of patients and surveillance of dengue fever.

The ultimate goal of this effort is to prevent mortality due to dengue fever. This is a very useful reference material on the subject as it was prepared basically to address the issues currently faced by the Sri Lankan medical staff taking into consideration the immense difficulties they confront with in patient management.

This publication can be downloaded from the Epidemiology Unit web site:

http://www.epid.gov.lk/publication.htm

Table 3: Selected notifiable diseases reported by Medical Officers of Health

03rd - 09th December 2005 (49th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	29	1765	04	281	00	02	02	60	04	118	01	143	00	04	00	101	77
Gampaha	32	1149	05	313	00	03	01	64	01	63	02	212	00	03	02	129	79
Kalutara	25	340	08	457	00	01	00	47	00	91	02	98	00	03	01	38	90
Kandy	25	521	19	438	00	04	05	132	06	37	06	61	01	72	05	100	73
Matale	02	56	45	457	01	03	02	27	00	30	02	38	00	00	00	14	75
Nuwara Eliya	00	17	01	299	00	00	07	208	00	290	01	12	01	24	02	32	86
Galle	00	81	00	145	00	04	00	18	03	27	02	81	00	08	00	10	50
Hambantota	03	41	14	274	00	01	00	09	00	45	00	42	02	75	00	15	100
Matara	10	146	06	198	00	02	00	36	00	31	01	151	05	135	01	13	86
Jaffna	00	11	04	183	00	02	00	294	00	20	00	01	00	86	00	86	38
Kilinochchi	01	04	02	60	00	00	00	10	00	27	00	00	00	00	00	06	75
Mannar	00	00	03	50	00	00	03	58	00	25	00	00	00	01	01	17	83
Vavuniya	00	23	22	191	00	03	00	197	00	23	00	02	00	00	00	11	100
Mullaitivu	00	00	02	20	00	00	01	30	00	02	00	00	00	03	00	16	100
Batticaloa	00	05	00	41	00	02	00	07	00	03	00	02	00	05	05	305	22
Ampara	00	10	01	121	00	00	00	05	00	10	00	15	00	01	00	43	57
Trincomalee	00	46	03	378	00	00	00	41	00	39	00	06	00	04	02	196	67
Kurunegala	12	120	50	704	00	02	03	70	00	45	05	32	00	12	02	69	88
Puttalam	01	115	50	313	00	03	02	172	00	07	01	25	00	01	01	48	89
Anuradhapura	21	128	03	215	00	02	00	25	00	105	00	76	00	17	01	48	47
Polonnaruwa	02	53	04	76	00	00	00	76	00	07	00	19	00	02	00	25	86
Badulla	05	61	18	664	00	00	04	203	00	30	02	68	01	106	03	191	80
Monaragala	00	11	11	222	00	01	04	69	00	22	02	90	01	107	04	98	90
Ratnapura	05	383	20	635	00	20	03	283	00	22	02	91	00	15	04	93	100
Kegalle	04	121	11	366	00	02	02	39	00	11	01	152	01	48	02	98	60
Kalmunai	00	04	04	90	00	03	00	27	00	01	00	00	00	03	15	302	36
SRI LANKA	177	5211	310	7191	01	60	39	2207	14	1131	30	1417	12	735	51	2104	73

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 17th December 2005 :Total number of reporting units = 279.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WEEKLY EPIDEMIOLOGICAL REPORT
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WER SRI LANKA - 2005

Vol. 32 No. 51 **17th - 23rd December 2005**

Too Risky to Eat?

For the surveillance purposes in Sri Lanka, food poisoning is defined as **"an acute gastroenteritis in a person linked to an ingested food or liquid: or an outbreak of acute gastroenteritis in two or more persons linked by common exposure to food or liquid ingested."** A relatively wide range of microorganisms or their toxins are responsible for food poisoning. Outbreaks can occur anywhere and at anytime where people consume food irrespective of whether it is the home, the working place, a ceremonial gathering or a public restaurant.

The consequences of food poisoning could be anything from the mildest - a brief unpleasant experience to the worst - a death. Commonly it is mild in nature and passes off without any treatment or any attention. However, if occurred in large numbers or in severe forms it attracts public attention and the attention of the health care system.

During the first 50 weeks of this year, 1143 cases of suspected food poisoning have been notified. This provides a crude rate of six cases per 100,000 population for the said time period. Out of these 1143 cases, at least 50% were due to large-scale outbreaks occurring at factories, hostels and ceremonial functions. Therefore, notification figures do not reflect the real magnitude. Since there is no limit in time or place for food poisoning to occur, prevention would be possible only if hygienic food handling practices are employed universally. However, major concern would be where a large number of people consume the same food item posing the threat of large outbreaks. Therefore, more emphasis is necessary to ensure the application of hygienic food handling practices at places where food is prepared for consumption by a large number of people. The main focus is hotels and restaurants. In addition, there are certain ceremonial functions, factories and other work places where a large number of people consume food collectively.

At times, this food is prepared as household enterprises. Therefore, the accessibility to these places may not be straightforward as in established hotels and restaurants. However, Public Health Inspectors (PHII) can gather information regarding these places during their factory visits. As well, there may be instances these persons submit for formal registration at the local government. Inspection of these places by PHII should be constructive, so as to encourage and guide food handlers to engage in safe practices. Structure of the food preparation area, its ventilation, lighting, water supply, garbage disposal are among the things that has to be evaluated. In addition, the health of food handlers and their practices, food storage methods also should be evaluated.

Structures within food establishments should be soundly built with durable materials and be easy to maintain and clean. In particular, the surfaces of walls, partitions and floors should be made with impervious materials with no toxic effect in intended use. The walls and partitions should have a smooth surface up to a height appropri-

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(Continued from page 1)

ate to the operation. Floors should be constructed to allow adequate drainage and cleaning. Ceilings and overhead fixtures should be constructed and finished to minimize the build up of dirt and condensation, and the shedding of particles. Windows should be easy to clean.

Equipment and containers (other than once-only use containers and packaging) coming into contact with food, should be ensured that, they can be adequately cleaned, disinfected and maintained to avoid contamination of food. Equipment and containers should be made with materials with no toxic effect in intended use. Where necessary, equipment should be durable and movable or able to be dismantled to facilitate for maintenance, cleaning, disinfection, monitoring and, inspection for pests.

An adequate supply of potable water with appropriate facilities for its storage and distribution should be available to ensure the safety and suitability of food. Adequate drainage and waste disposal systems and facilities too should be provided. They should be designed and constructed so that the risk of contaminating food or the potable water supply is avoided.

Adequate facilities, suitably designated, should be provided for cleaning food, utensils and equipment. Personnel hygiene facilities should be available to ensure that an appropriate degree of personal hygiene can be maintained and to avoid contaminating food. Facilities should include adequate means of hygienically washing hands, including wash basins and a supply of water. Lavatories of appropriate hygienic design should be available but should be adequately away from the food preparation and storage areas. Adequate changing facilities for personnel also should be available.

Adequate means of natural or mechanical ventilation should be provided, in particular to minimize air-borne contamination of food, for example, from aerosols and condensation droplets. Ventilation should be able to control odours which might affect the suitability of food and to control humidity, ensuring the safety and suitability of food.

Adequate natural or artificial lighting should be provided to enable the undertaking to operate in a hygienic manner. Lighting should not be such that the resulting colour is misleading. The intensity should be adequate to the nature of the operation.

Adequate facilities for the safe and separate storage of food, ingredients and non-food chemicals (e.g. cleaning materials, lubricants, fuels) should be provided. Food storage facilities should permit adequate maintenance and cleaning, to avoid pest access and harbourage.

Fresh fruits and vegetables should be kept separated from raw meat, poultry, or seafood in the refrigerator. In food preparation, separate cutting boards should be kept for meat and vegetables. Same cutting board should not be used without cleaning with hot water and soap before and after preparing food.

Food should be prepared as close as the time of consumption. If prepared earlier, should be kept warm until it is consumed. Otherwise precooked food has to be refrigerated immediately after preparation and reheated adequately before consumption. Saving left-over food for future consumption is not usually advocated and should never happen in hotels, restaurants, hostels etc.

Pathogens can be transferred from one food to another, either by direct contact or by food handlers, contact surfaces or the air. Raw, unprocessed food should be effectively separated from cooked/ processed food.

The availability of food and water encourages pest harbourage and infestation. Potential food sources should be stored in pest-proof containers and/or stacked above the ground and away from walls. Areas both inside and outside food premises should be kept clean. Refuse should be stored in covered, pest-proof containers. Suitable provision must be made for the removal and storage of waste. Waste must not be allowed to accumulate in food handling, food storage, and other working areas and the adjoining environment.

People known, or suspected, to be suffering from, or to be a carrier of a disease or illness likely to be transmitted through food, should not enter any food handling area, if there is a likelihood of contaminating food. Any person so affected should make aware of the illness or symptoms of illness to a responsible person. Conditions that should be reported, so that any need for medical examination and/or possible exclusion from food handling can be considered include, jaundice, diarrhea, vomiting, fever, sore throat with fever, visibly infected skin lesions such as boils, cuts, etc., discharges from the ear, eye or nose.

Food handlers should maintain a high degree of personal cleanliness and, where appropriate, should wear suitable protective clothing, head covering, and footwear. Cuts and wounds, where personnel are permitted to continue working, should be covered by suitable waterproof dressings. Personnel should always wash their hands when personal cleanliness may affect food safety, for example, at the start of food handling activities, immediately after using the toilet and after handling raw food or any contaminated material, where this could result in contamination of other food items, they should avoid handling ready-to-eat food, where appropriate.

People engaged in food handling activities should refrain from behaviour, which could result in contamination of food, for example, smoking, spitting, chewing or eating, sneezing or coughing over unprotected food.

(Continued on page 3)

Table 1: Vaccine-preventable diseases & AFP

10th - 16th December 2005 (50th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 GM=1	00	00	01 BT=1	00	00	00	00	02	02	102	92	10.9%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	00	00	00	00	01 AP=1	00	00	01	02	45	78	-42.3%
Tetanus	00	00	01 HB=1	00	00	00	00	00	01	01	35	42	-16.7%
Whooping Cough	00	00	00	00	00	00	00	01 KG=1	01	01	112	50	+124.0%
Tuberculosis	81	20	12	03	13	00	00	11	140	94	9483	8514	+11.4%

Table 2: Diseases under Special Surveillance

10th - 16th December 2005 (50th Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	85	24	10	03	19	04	06	05	156	120	5395	14988	-64.0%
Encephalitis	00	00	00	00	00	00	00	00	00	03	60	102	-41.2%
Human Rabies	00	00	00	00	00	00	00	00	00	01	53	95	-44.2%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.; **NA**= Not Available

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis
Special Surveillance : Acute Flaccid Paralysis
National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

(Continued from page 2)

Food must be adequately protected during transport. The type of conveyances or containers required depends on the nature of the food and the conditions under which it has to be transported.

Food poisoning outbreaks should be considered as an emergency. Hospital staff or the General Practitioners are the first persons coming to know of such outbreaks. They should inform such a situation to the area Medical Officer of Health (MOH) immediately preferably over the telephone. The MOH along with the PHI should investigate the outbreak to identify the source of food poisoning, and to prevent further spread. New cases if any should be identified and should ensure appropriate treatment. Sampling of food for bacteriological and toxicological analysis would reveal the source and the causative organism for food poisoning.

MOH should make this an opportunity to educate the food handlers on the importance of hygienic food handling practices and its basics. This also would be a good practical exercise in outbreak investigation for all the primary health care staff.

Source:

Codex Alimentarius Commission. Basic Texts on Food Hygiene. Third Edition. Joint FAO/WHO Food Standard Programme. Italy 2003.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

10th - 16th December 2005 (50th Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	41	1814	02	283	00	02	01	62	00	118	02	145	00	04	03	104	62
Gampaha	24	1177	08	324	00	03	03	67	01	64	04	217	01	04	05	134	86
Kalutara	20	360	03	460	00	01	03	50	00	91	00	98	00	03	01	39	70
Kandy	14	545	15	456	00	04	03	136	01	38	01	63	03	76	00	100	73
Matale	06	62	34	511	00	03	00	27	00	30	01	39	00	00	00	14	92
Nuwara Eliya	04	21	06	305	00	00	01	209	00	290	00	12	00	24	01	33	86
Galle	02	85	00	147	00	04	00	18	00	27	00	81	00	08	00	10	63
Hambantota	01	42	02	276	00	01	01	10	02	47	00	42	00	75	00	15	80
Matara	07	153	06	204	00	02	00	36	01	32	00	151	03	138	00	13	86
Jaffna	01	12	07	194	00	02	08	315	02	22	00	01	01	87	04	95	63
Kilinochchi	00	04	00	66	00	00	00	10	00	27	00	00	00	00	00	06	50
Mannar	00	00	03	53	00	00	02	60	00	25	00	00	00	01	00	17	83
Vavuniya	00	23	04	195	00	03	01	198	00	23	00	02	00	00	00	11	100
Mullaitivu	00	00	00	20	00	00	01	31	00	02	00	00	00	03	01	17	100
Batticaloa	02	07	00	44	00	02	00	07	00	03	00	02	00	05	02	309	44
Ampara	00	10	00	122	00	00	00	05	00	10	00	15	00	01	00	44	57
Trincomalee	00	46	07	401	00	00	00	41	00	39	00	06	00	05	04	208	56
Kurunegala	19	139	42	762	00	02	01	71	00	45	03	36	00	12	01	70	82
Puttalam	00	116	12	332	00	03	01	173	00	07	00	26	00	01	00	48	44
Anuradhapura	02	131	07	230	00	02	00	26	00	105	01	79	00	18	00	49	68
Polonnaruwa	02	55	03	79	00	00	00	76	00	07	00	19	00	02	00	25	86
Badulla	06	67	14	681	00	00	06	210	00	30	01	69	01	108	05	196	73
Monaragala	00	11	16	238	00	01	01	70	00	22	04	95	00	107	00	98	100
Ratnapura	03	386	09	644	00	20	01	284	00	22	03	94	00	15	00	93	67
Kegalle	02	125	05	374	00	02	00	39	05	16	12	168	00	49	01	99	70
Kalmunai	00	04	03	93	00	03	00	27	00	01	00	00	00	03	10	317	27
SRI LANKA	156	5395	208	7494	00	60	34	2258	12	1143	32	1460	09	749	38	2164	71

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 24th December 2005 :Total number of reporting units = 279.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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WEEKLY EPIDEMIOLOGICAL REPORT

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Vol. 32 No. 52 **24th - 30th December 2005**

WER SRI LANKA - 2005

Flashback 2005

Dawn of the year 2005 had offered perhaps the greatest challenge to the epidemiology unit since its inception. A few days ago, on that fateful boxing day, a tsunami had struck the costal areas of South East Asia causing a heavy death toll and property destruction. International agencies feared that the indirect deaths in the aftermath of the disaster as a result of unsanitary conditions could exceed deaths directly due to the tsunami. Consequently, addition of a new dimension was essential to the traditional mission of the unit, which was promotion of health and quality of life of Sri Lankans by preventing communicable diseases, injuries and disabilities. Epidemiology Unit stood up to this challenge from the beginning of the new year having established a special surveillance of communicable diseases and giving appropriate guidelines and leadership to normalize the environmental conditions unfavourable to the occurrence and spread of communicable diseases. Today, we along with our brethren in the country look back with dignity to tell the world that we as a nation managed to prevent major health catastrophes in the aftermath of one of the most fearful natural disasters. To share with the future generations, with the support of UNICEF. it was possible to document the post tsunami experiences of Epidemiologists. In future, this will be a hands on reference in a booklet format.

To embark on a mission, as established by the unit, technical capacity of the unit is of paramount importance. To face up to these daunting challenges, the unit recruited several post graduate qualified medical officers as a move to strengthen its capacity. This was further strengthened by the recruitment of graduates during the past 12 months. Parallel to these changes, Epidemiology Unit was granted the status of financial autonomy, which was long overdue, in July 2005. A new face-lift has been given to the unit with the completion of its long awaited refurbishment.

Disease surveillance remains one of the key functions of the epidemiology Unit. The biggest challenge during the bygone year was the sustainability of enhanced disease surveillance in the tsunami affected areas while strengthening same in the rest of the island. As a measure of sustaining the interest and motivating the officers to continually monitor the disease situation, three reviews were carried out in three provinces affected by tsunami.

The success of the disease surveillance in the tsunami affected areas was reflected in the ability to forecast two outbreaks of hepatitis A. Timely intervention contained the outbreak. The Unit provided expert guidance to the WHO project on computerization of disease surveillance system in major hospitals in tsunami affected areas. Collaborations with the CDC of the USA, Institute of Tropical Medicine of the Nagasaki University in Japan and the WHO opened avenues for research on respiratory diseases, Tuberculosis and diarrhoeal diseases in the tsunami affected areas. While paying focused attention to the disease surveillance in the disaster-affected areas, the unit actively involved in improving surveillance in the rest of the country.

The updated edition of the Weekly Epidemiological Report, the premier bulletin on disease surveillance activities in the country, for the previous week is now accessible on the website of the unit on every Tuesday. Bygone year saw the revision of the notifiable list of diseases with the addition of AFP, Chicken pox, Mumps and Meningitis. The gazette notification in this respect is pending.

The unit managed to fulfil quite a few long felt needs in 2005. With the support of multi disciplinary experts it could publish a handy booklet of case definitions for disease surveillance. The

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manual on poliomyelitis was revised and guidelines were developed for strengthening surveillance of measles and rubella. The success of the unit in AFP surveillance is reflected in the achievement of an AFP reporting rate above two per 100000 population in the past year.

Despite hectic schedules, the unit extended its support to review surveillance activities of AFP, diarroheal diseases, polio, measles, rubella etc. with a view to strengthening it at the district level. District teams enormously benefited from the unit during the year 2005. Regional Epidemiologists (REE) enhanced their capacity on data management using Epi-Info through training programmes conducted by the unit. They were equipped with computers, printers and vehicles with the support of the WHO.

Epidemiology Unit started to explore new, previously undiscovered horizons during the previous year. Unit in collaboration with the South Asian Pneumococal Network (SAPNA) initiated a pneumococal surveillance at the LRH. Further expanding collaboration with world-renowned agencies, surveillance of rotavirus was initiated at the LRH with the assistance of the Institute of Vaccine and Immunization (IVI). The same year witnessed our successful completion of the project of the surveillance of Haemophilus Influenzae b disease that was launched in the preceding year. The report was accomplished and the findings were shared with clinicians other relevant professionals. Adding new dimensions to the multi disciplinary cooperation, the epidemiology unit bridged the gap between epidemiologists, microbiologists, entomologists and clinicians with a residential workshop, which provided opportunity for participants to share their valuable work experience with colleagues. Fruition of this venture was made possible by the financial assistance of the United States Naval Medical Research Unit (NAMRU) based at Jakarta.

The story of immunization is a huge success in Sri Lanka and international agencies recognize it as a sound investment. Planning strategies in 2005 were focused on enhancing country's reputation in relation to immunization and sustaining current achievements. As a strategic move in this direction, EPI programme was reviewed quarterly with REE.

In Sri Lanka, more than 90% of the cost of the EPI is borne by the Government hence it is reasonable to state that the EPI programme in Sri Lanka is self-funded. Ensuring an uninterrupted service to the recipients remains the greatest challenge. Measures were taken by the Epidemiology Unit to procure vaccines in time so as not to interrupt the continuity of a long lasting successful programme.

The subsequent direction of the EPI programme is to ensure the service of the highest quality to recipients. Plans were drawn in the bygone year by the unit to establish 260 model immunization clinics (one in each MOH area) that will provide high quality services under the Health Sector Development Project of the WB/MH. A steady rising cost for National Immunization Programme has been observed to date and this will further continue to rise with the addition of new vaccines in the years to come. A financial sustainable plan for the EPI was prepared and submitted to the Global Alliance for Vaccines and Immunization (GAVI) for funding additional vaccines.

In the North & East, the unit achieved training of more than five hundred medical officers on managing EPI.

Among other accomplishments in 2005, third international course on AEFI, introduction of Hepatitis B vaccines for the final, phase III areas, development of Standards of Procedures on vaccine management with the involvement of foreign consultants and financial assistance of UNICEF and production of a video film on quality immunization practice deserve allusion.

No major outbreaks of diarrhoeal diseases, Japanese Encephalitis or dengue were reported in the past year. However, the country experienced heavy rains leading to floods in many parts of the country. Timely alerts and measures to avoid outbreak situations were dispatched to the regions for prompt action. In order to ensure, the uniformity in dissemination of outbreak related information and diffuse unnecessary panicking of masses, a central information cell was in operation during the period of deluge. Development and distribution of IEC materials to the districts was yet another feat of the unit in 2005.

As accustomed, immunization of Japanese Encephalitis vaccine were performed in high risk areas in May – September. A study on cost of JE immunization was initiated and currently underway. A fitting tribute to the success of the JE immunization programme in Sri Lanka was the documentary on control of JE produced by Rockhopper TV for the communication giant BBC with the assistance of the Programme for Appropriate Technology in Health (PATH).

Accomplishments in relation to the menace of dengue were phenomenal in 2005. A national plan of action was prepared and launched during the year 2005. By the end of the year 2005, case load had been reduced by nearly 75% in comparison to the preceding year despite heavy rains experienced throughout the year. Timely alerts forecasting impending epidemics and stressing the need for containment measures were issued regularly. The biggest realization was the development and implementation of action plans for 48 MOH areas with the financial assistance of the National Dengue control Unit during the bygone year. Guidelines for the management of dengue fever and dengue haemorrhagic fever have been finalized under the recommendations made by the sub committee on clinical management and the publication is currently in print and is available on the website.

Sri Lankan contribution for the global surveillance of dengue fever came into effect during this year by weekly updating the country situation into the Dengue Net - the global network on dengue fever surveillance managed by the WHO. In this aspect Sri Lanka is a leading country in the SEARO region.

Among other feats in 2005, investigation of the myocarditis outbreak at Badulla and Peradeniya were challenging, new experiences to the unit. Alabama University of the USA came forward to assist us in addressing a long neglected issue by conducting an international workshop on health effects of pesticides in September, 2005. Operationalizing of activities to address the issue of concern is already in its embryonic stages.

Epidemiology Unit revolutionized the concept of reviews by

Table 1: Vaccine-preventable diseases & AFP

17th - 23rd December 2005 (51st Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 GM=1	01 KD=1	01 GL=1	00	00	01 PO=1	00	01 SB=1	05	01	107	93	+15.1%
Diphtheria	00	00	00	00	00	00	00	00	00	00	01	01	00.0%
Measles	00	00	00	00	00	00	00	00	00	00	45	78	-42.3%
Tetanus	00	00	00	00	00	00	00	00	00	02	35	44	-20.5%
Whooping Cough	00	00	00	00	00	00	00	01 KG=1	01	02	113	52	+117.3%
Tuberculosis	69	20	00	10	19	00	00	00	118	62	9601	8576	+12.0%

Table 2: Diseases under Special Surveillance

17th - 23rd December 2005 (51st Week)

Disease	No. of Cases by Province								Number of cases during current week in 2005	Number of cases during same week in 2004	Total number of cases to date in 2005	Total number of cases to date in 2004	Difference between the number of cases to date between 2005 & 2004
	W	C	S	NE	NW	NC	U	Sab					
DF/DHF*	85	24	10	03	19	04	06	05	186	132	5608	15155	-63.0%
Encephalitis	00	00	01 MT=1	00	00	00	00	00	01	04	62	107	-42.1%
Human Rabies	00	00	00	01 TR=1	00	00	00	00	01	00	54	95	-43.2%

***DF / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever; Details by districts are given in Table 3.; **NA**= Not Available

Source : Weekly Return of Communicable Diseases :Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis

Special Surveillance : Acute Flaccid Paralysis

National Control Program for Tuberculosis and Chest Diseases : Tuberculosis

Key to Tables 1 and 2 :

Provinces :W=Western, C=Central, S=Southern, NE=North & East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.

DPDHS Divisions :CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Kilinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttlam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

conducting performance reviews in districts. This enabled the epidemiologists to visit the field and assess the situation prevailing in the respective districts. Findings of three such reviews with recommendations were disseminated to district authorities in Ratnapura, Kurunegala and Puttalam. The last performance review was conducted in Anuradhapura in December.

Technical capacity of the Epidemiology Unit was given the due recognition by the Ministry of Health in 2005 when it was entrusted with the task of conducting an external review of the health services in North-Western (Wayamba) province as an ongoing preparation for the Annual Wayamba Health Summit. Conducting the Puttalam district review was also a part of the summit.

The other daunting task that the unit undertook during the bygone year was the preparation for the possible avian influenza outbreak. Epidemiology Unit took the leading role in harnessing efforts of all different professionals to prepare a comprehensive plan in this regard. The outcome of this effort was the National Preparedness Plan for Avian influenza. Sri Lanka is leading the pack in South Asia in this regard.

With a national calamity in the background, year 2005 was a high exigent year for the Epidemiology Unit. With fierce dedication to the cause, it was able to accomplish the exceedingly large volume of objectives it outlined at the inception. The unit humbly recognizes the invaluable support extended by all staff categories in the Ministry of Health, other governmental and non governmental (local and foreign) organizations, media and general public without which the accomplishment of its objectives would have been so far away.

We are on the verge of the dawn of a fresh year. Epidemiology Unit will be ready as ever to fulfil its commitment to the national cause of ensuring the quality of life for all Sri Lankans by ensuring optimal health.

Table 3: Selected notifiable diseases reported by Medical Officers of Health

17th - 23rd December 2005 (51st Week)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephalitis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Returns Received Timely**
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	47	1865	03	286	00	02	01	64	01	119	02	148	00	04	02	106	38
Gampaha	31	1215	11	335	00	03	01	68	00	66	03	220	00	05	03	137	57
Kalutara	11	373	00	466	00	01	01	51	02	94	02	101	00	03	00	39	40
Kandy	39	586	13	470	00	04	02	138	00	38	03	68	06	82	02	102	82
Matale	04	66	19	530	00	03	00	27	00	30	00	39	00	00	00	14	83
Nuwara Eliya	01	22	01	306	00	00	01	210	00	290	01	13	00	24	02	35	71
Galle	04	89	02	149	00	04	01	19	00	27	03	84	00	08	02	12	63
Hambantota	00	42	04	280	00	01	01	11	00	47	01	43	00	75	00	15	80
Matara	09	162	04	208	01	03	00	36	00	32	02	153	03	141	00	13	100
Jaffna	01	13	02	206	00	02	06	326	00	22	00	01	00	89	04	102	63
Kilinochchi	00	04	00	66	00	00	02	12	00	27	00	00	00	00	00	06	100
Mannar	00	00	00	53	00	00	02	62	00	25	00	00	00	01	01	18	83
Vavuniya	01	24	07	202	00	03	02	200	01	24	01	03	00	00	00	11	100
Mullaitivu	00	00	00	20	00	00	00	31	00	02	00	00	00	03	00	17	00
Batticaloa	00	07	00	44	00	02	01	08	01	04	00	02	00	05	02	311	44
Ampara	00	10	00	123	00	00	00	06	00	10	00	15	00	01	01	46	43
Trincomalee	01	47	08	409	00	00	00	41	00	39	00	06	00	05	04	212	44
Kurunegala	05	144	15	804	00	02	04	76	00	45	00	37	00	12	02	72	76
Puttalam	01	118	19	368	00	03	00	173	00	07	01	27	00	01	00	52	67
Anuradhapura	01	133	11	243	00	02	00	26	00	105	02	81	01	19	03	52	58
Polonnaruwa	05	60	02	81	00	00	00	76	00	07	02	21	00	02	01	26	86
Badulla	00	68	14	696	00	00	04	214	00	30	00	69	01	109	00	196	80
Monaragala	00	11	05	243	00	01	01	71	01	23	01	96	01	108	00	98	90
Ratnapura	23	412	08	655	00	21	01	285	00	22	04	98	01	16	01	94	67
Kegalle	02	133	06	381	00	02	00	39	00	16	06	179	01	50	01	100	70
Kalmunai	00	04	05	99	00	03	00	28	00	01	00	00	00	03	11	328	27
SRI LANKA	186	5608	159	7723	01	62	31	2298	06	1152	34	1504	14	766	42	2214	67

Source : Weekly Returns of Communicable Diseases (WRCD)

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever

****Timely** refers to returns received on or before 31st December 2005 :Total number of reporting units = 279.

A = Cases reported during the current week**; B** = Cumulative cases for the year;

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