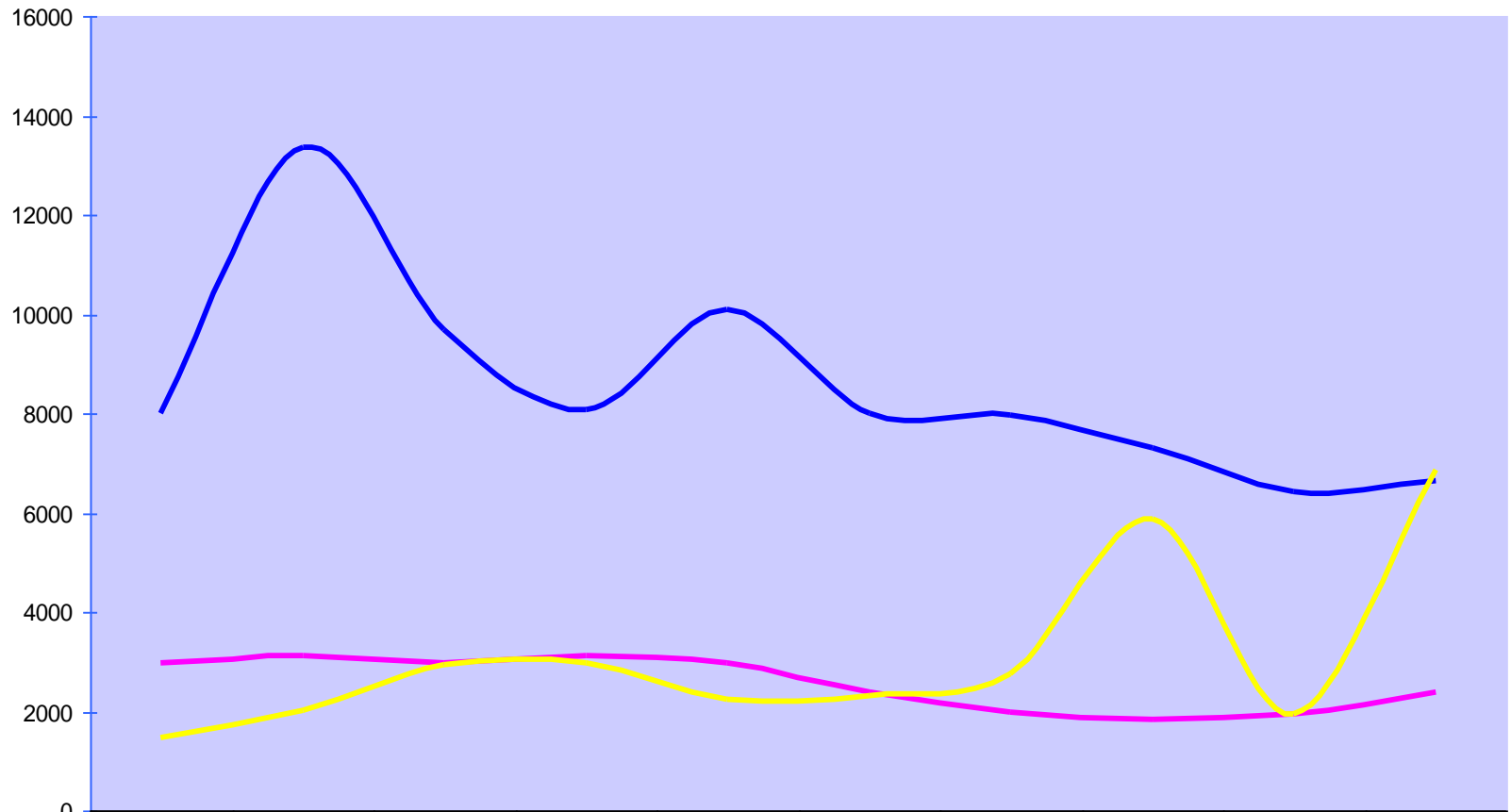




INTESTINAL INFECTIONS

Dr. Anura Jayasinghe. MBBS, MSc, MD

Trend of main water borne diseases in Sri Lanka



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
— B. dysentery cases	8000	13365	9672	8063	10106	7999	7976	7313	6424	6645
— Enteric fever cases	2970	3108	2962	3116	2978	2382	1989	1825	1950	2376
— Viral hepatitis cases	1486	2034	2936	2984	2237	2294	2765	5884	1930	6860

E coli

- Live in the intestines of people and animals.
- Most varieties of E. coli are harmless
- E. coli O157:H7, can cause severe, bloody diarrhea
- Expose to E. coli from contaminated water or food

E coli causes cont...

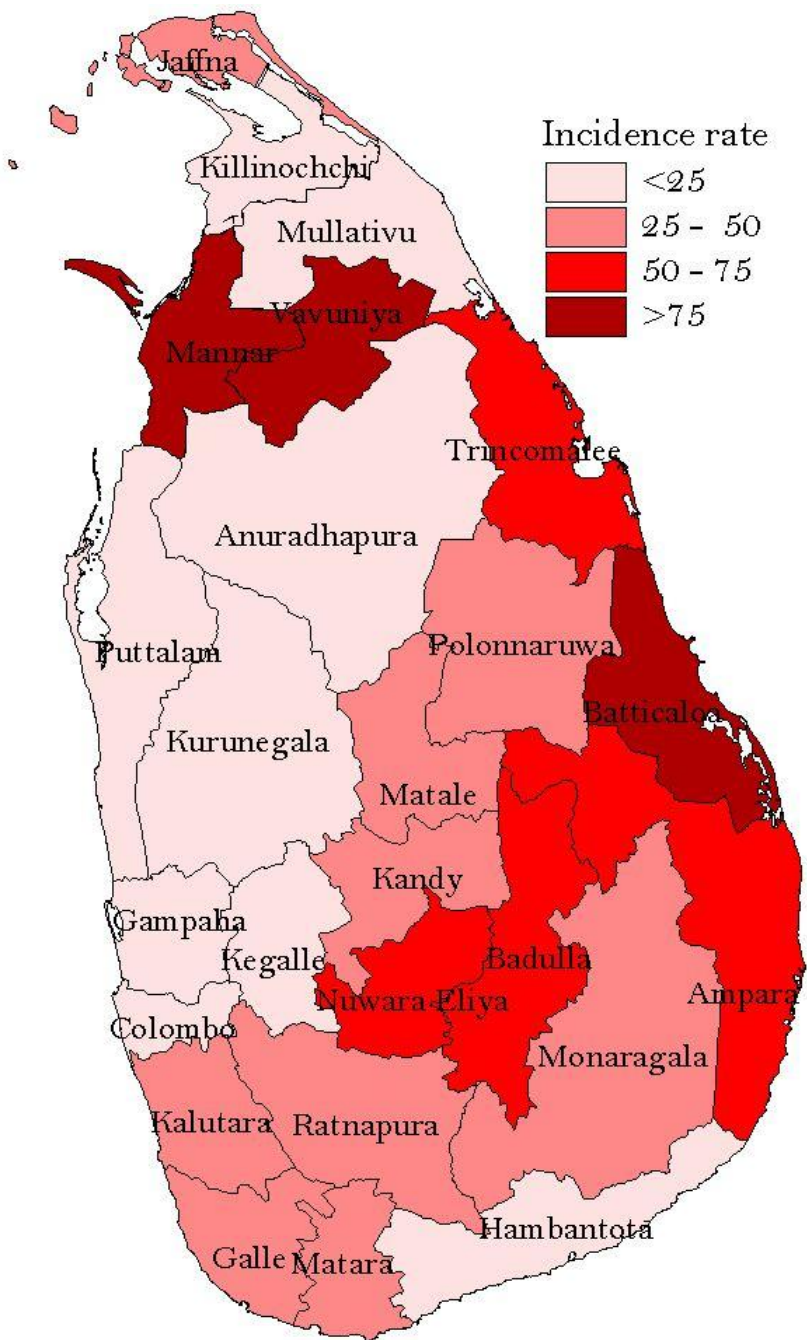
- **Contaminated food**
 - ▣ **Beef:** When cattle are slaughtered and processed, E. coli bacteria in their intestines can get on the meat.
 - ▣ **Unpasteurized milk:** E. coli bacteria on milking equipment can get into raw milk.
 - ▣ **Fresh produce:** Runoff from cattle farms can contaminate fields: spinach and lettuce

E coli causes

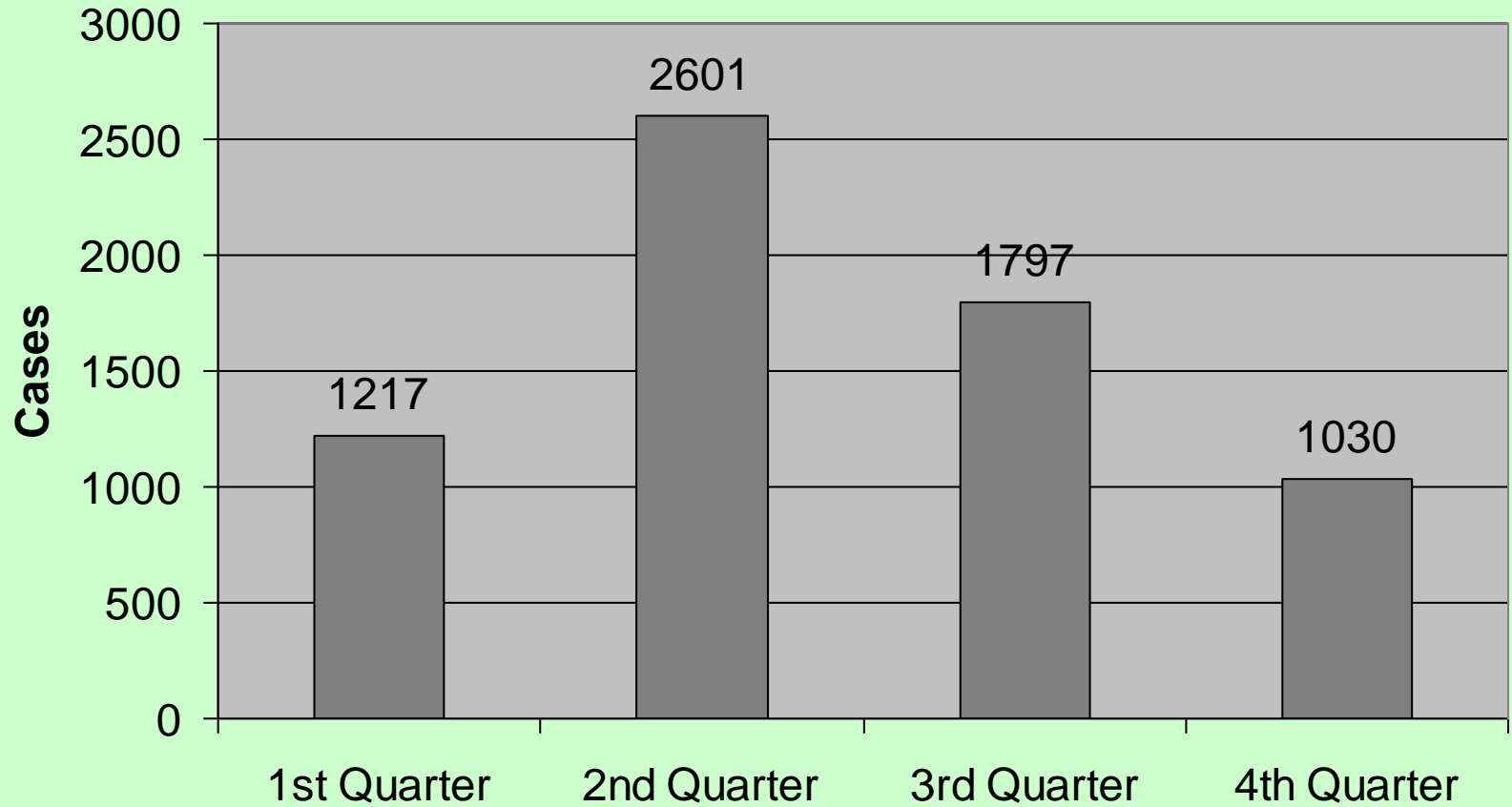


- **Contaminated water:** Human and animal feces
- **Personal contact:** E. coli bacteria can easily travel from person to person, especially when infected adults and children don't wash their hands properly. Restaurant workers who don't wash their hands after using the bathroom can transmit E. coli bacteria to food.

Bacillary Dysentery



Notified Cases of Bacillary Dysentery 2009



Bacillary Dysentery	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Badulla	72	80	114	178
Kandy	99	81	50	146
Kurunegala	48	55	88	132
Trincomalee	27	32	60	131
Batticaloa	38	134	73	120
Ratnapura	186	136	116	114
Ampara	10	20	27	100
Moneragala	15	19	69	94
Anuradhapura	25	44	37	86
Polonnaruwa	10	12	51	79
Colombo	49	58	72	77
Kalutara	86	84	129	76
Puttalam	41	42	48	72
Matale	27	34	45	67
Nuwara-Eliya	110	157	96	60
Galle	55	56	99	59
Kalmunai	46	18	28	59
Mannar	11	37	36	56
Gampaha	39	56	34	50
Matara	92	76	60	47
Jaffna	33	39	31	46
Vavuniya	36	1250	336	39
Kegalle	34	55	70	37
Hambantota	26	26	28	32
Mullaitivu	2	0	0	0
Kilinochchi	0	0	0	0

Shigella causes



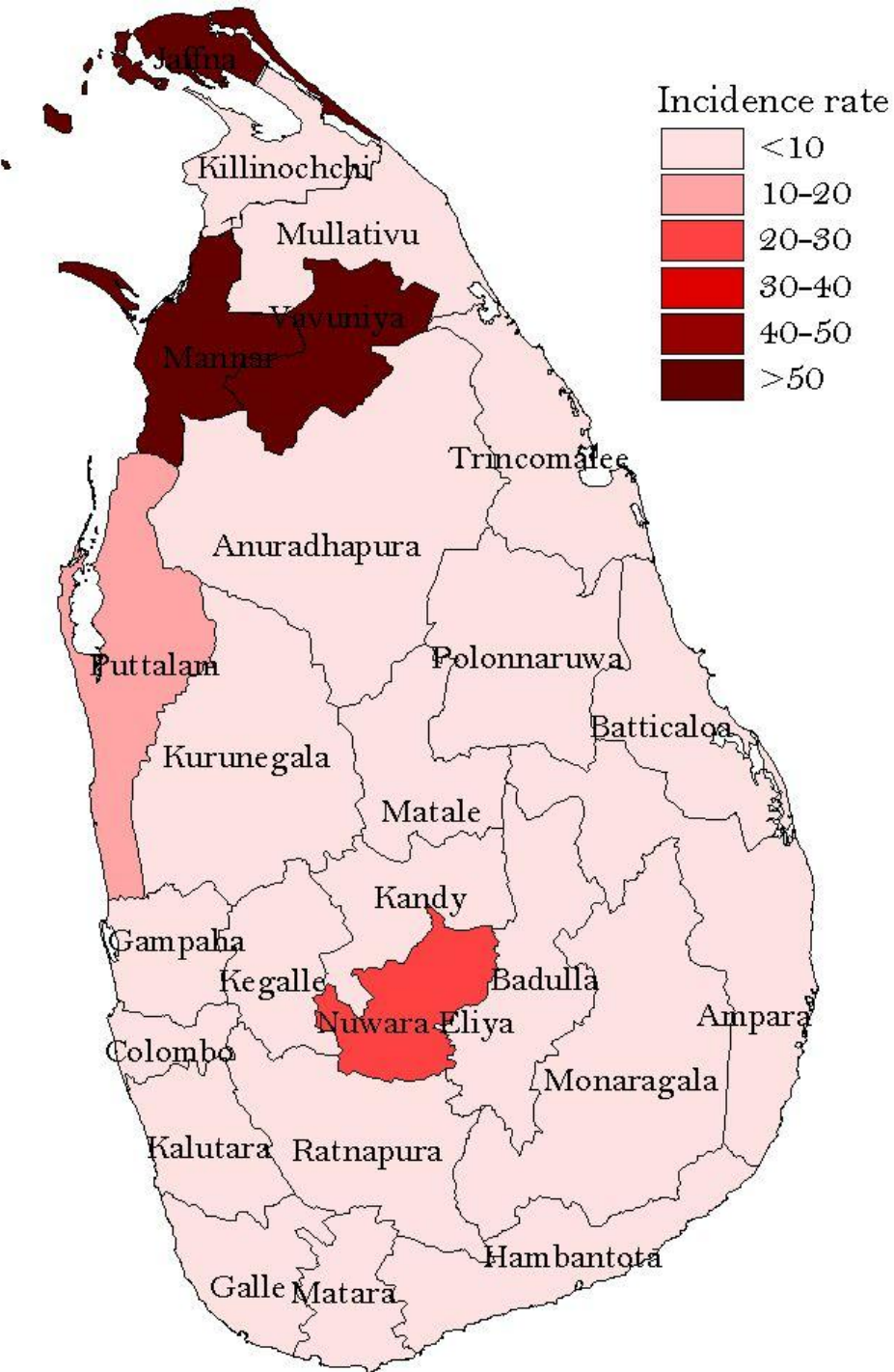
- **Poor hygiene and inadequate hand washing can cause Shigella to spread from an infected person.**
- **Eating contaminated food can cause shigellosis,**
 - Handling by an infected person who fails to wash adequately after using the toilet
 - Growing in a field that contains sewage
 - Coming into contact with flies that breed in infected feces
- **Drinking water infected with Shigella or swimming in infected water**



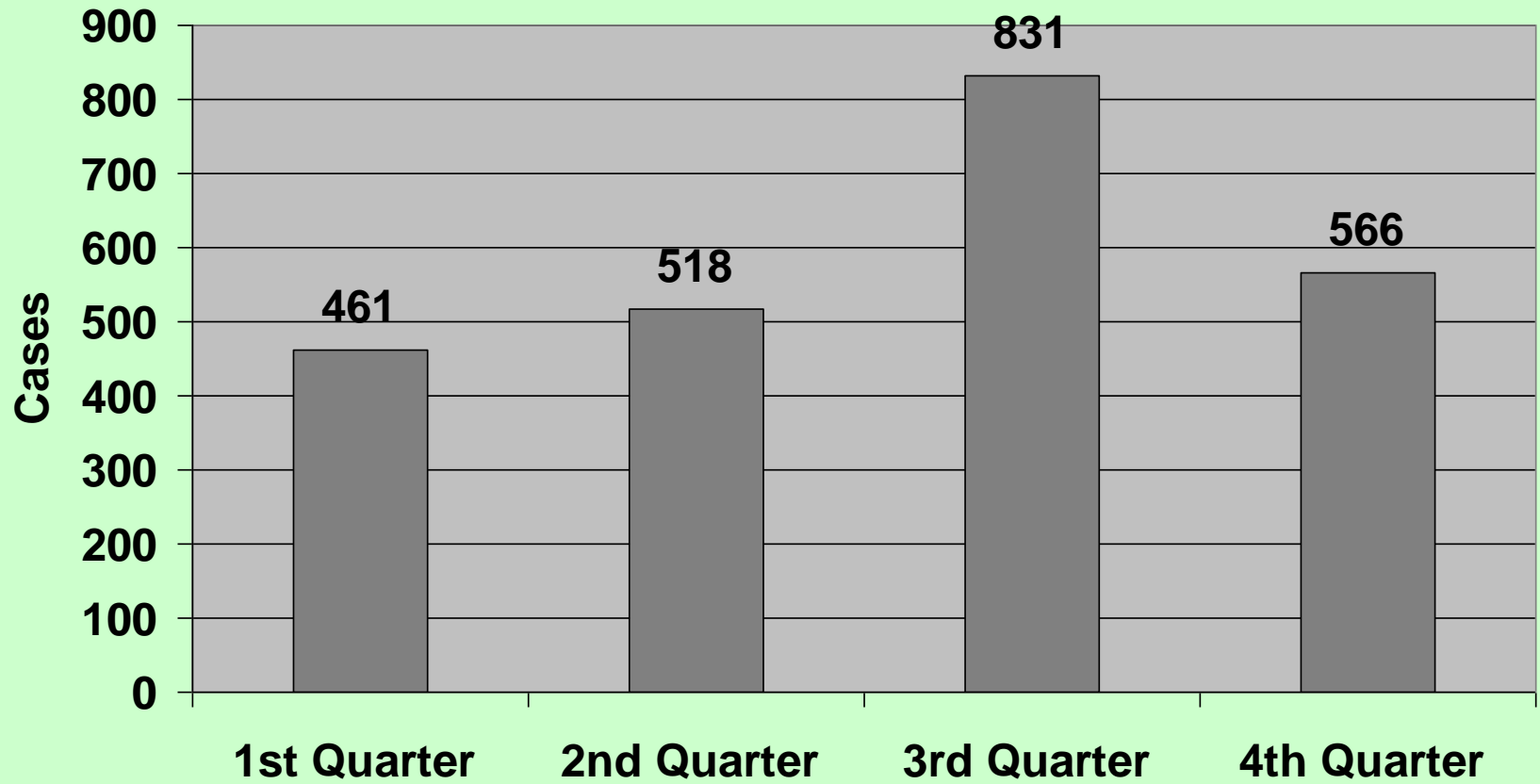
- **Risk factors**

Shigella infection is highly contagious, particularly for children.

Enteric Fever



Notified Cases of Enteric fever 2009



Enteric Fever	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Jaffna	72	88	61	172
Vavuniya	2	144	498	62
Colombo	65	37	75	52
Nuwara-Eliya	57	72	31	45
Badulla	16	11	12	34
Kurunegala	16	24	22	28
Mannar	56	22	21	28
Puttalam	36	20	9	19
Kegalle	12	11	18	18
Trincomalee	0	4	5	16
Gampaha	19	10	10	15
Kalutara	23	19	7	15
Batticaloa	5	2	8	13
Ratnapura	22	14	11	11
Kandy	9	8	7	9
Matale	14	9	3	9
Matara	4	0	2	7
Moneragala	7	8	8	3
Hambantota	2	3	1	3
Galle	0	2	1	3
Kalmunai	5	3	6	2
Anuradhapura	3	1	3	2
Ampara	5	0	7	0
Polonnaruwa	10	6	5	0
Mullaitivu	1	0	0	0
Kilinochchi	0	0	0	0

Typhoid

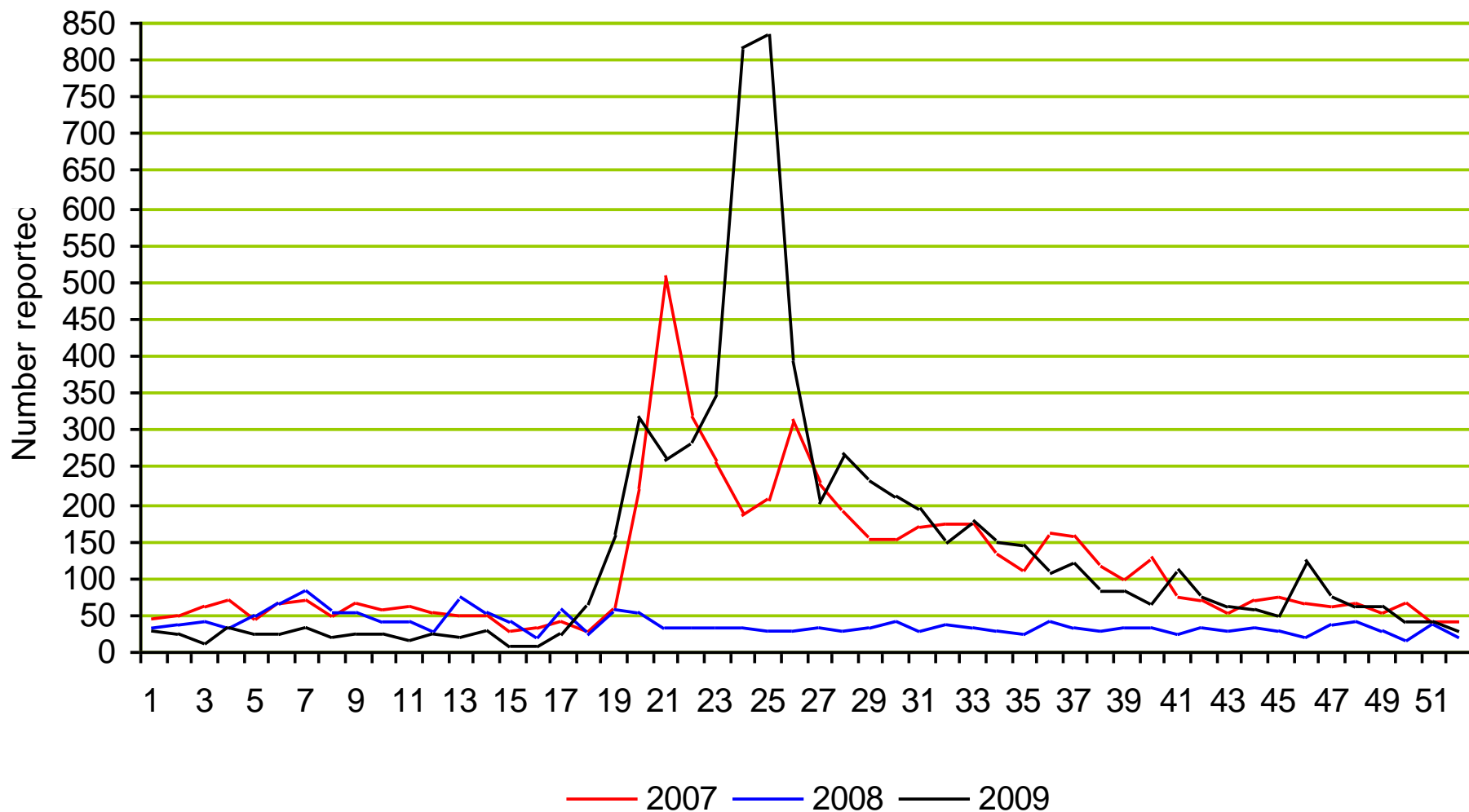


- Typhoid fever is caused by *Salmonella typhi* bacteria.
- Typhoid fever spreads through contaminated food and water or through close contact with someone who's infected.
- Signs and symptoms usually include high fever, headache, abdominal pain, and either constipation or diarrhea.

Weekly Incidence of Viral Hepatitis

Sri Lanka, 2007 - 2009

15



Hepatitis

- Hepatitis A is a highly contagious liver infection caused by the hepatitis A virus.



Transmit

- When someone with the virus handles the food you eat without first carefully washing his or her hands after using the toilet
- Drinking contaminated water
- Eating raw shellfish from water polluted with sewage
- Being in close contact with a person who's infected: even if that person has no signs or symptoms
- Having sex with someone who has the virus
- Receiving a blood transfusion with blood that contains the virus, though this is very rare

Treatments and drugs

- **No specific treatment exists** for hepatitis A.
- **Expect to have less energy.** Rest when you need to. You may need several days off work or school in order to recover.
- **Find ways to cope with nausea.** Eat small snacks throughout the day, rather than three large meals. Try soft, easily digested foods, such as soup or broth, yogurt and toast.
- **Give your liver a rest.** Your liver may have difficulty processing medications and alcohol if you have hepatitis A.



□ Lifestyle and home remedies

You can take steps to reduce the risk that you may pass the virus to others. Take steps to:

- **Wash your hands thoroughly after using the toilet.** Scrub vigorously for at least 10 seconds and rinse well. Dry your hands with a disposable towel.
- **Don't prepare food for others while you're actively infected.** You can easily pass this highly contagious infection to other people.



Let others know it's OK to be near you.

You **can't** spread the hepatitis A virus by sneezing, coughing, hugging or sitting next to someone.

Salmonella infection

- Salmonella bacteria typically live in the intestines of animals and humans and are shed through feces. Humans become infected most frequently through contaminated water or food sources: such as poultry, meat and eggs.
- Typically, people with salmonella infection develop diarrhea, fever and abdominal cramps within 12 to 72 hours. Signs and symptoms of salmonella infection generally last four to seven days. Most healthy people recover without specific treatment.

Wells



Tube wells



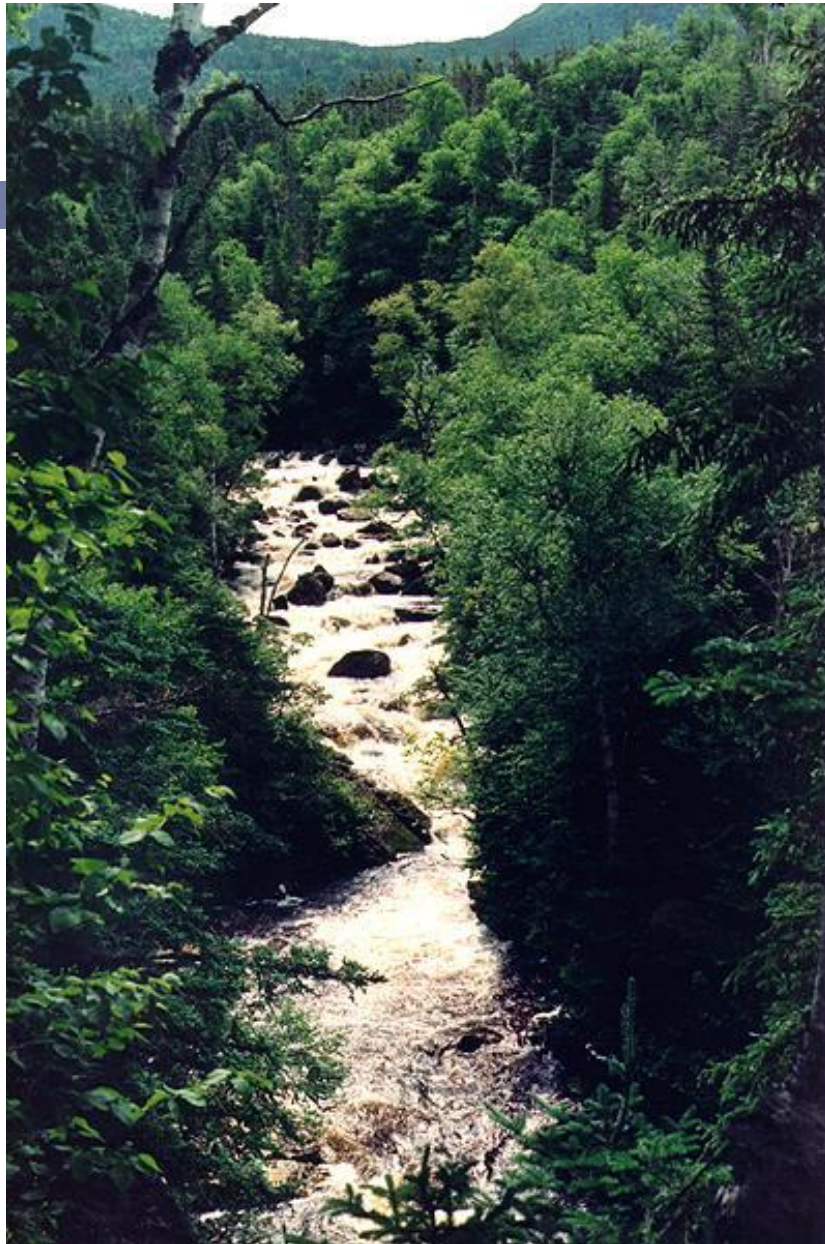
Community water projects



Lake



Stream





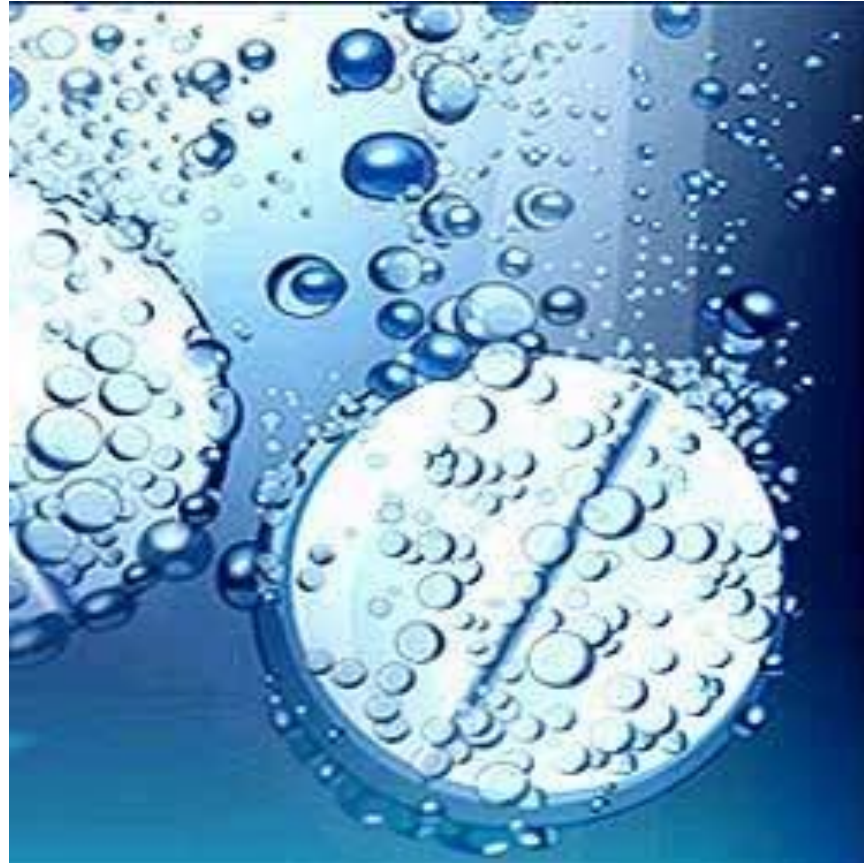
Boiling



Filtration



Chlorine tablets



Chlorination



Control and Prevention of Intestinal Infection



- **Wash your hands.** Frequent hand washing is the best way to control infection.
- **Avoid drinking untreated water.**



- **Avoid raw fruits and vegetables.** avoid fruits and vegetables that you can't peel
- **Choose hot foods.** Avoid food that's stored or served at room temperature. Steaming hot foods are best. it's best to avoid food from street vendors



- **To prevent infecting others**
- **Clean household items daily.** Clean toilets, door handles, telephone receivers and water taps at least once a day with a household cleaner and paper towels or disposable cloths.



- **Avoid handling food.** Avoid preparing food for others until your doctor says you're no longer contagious.
- **Keep personal items separate.** Set aside towels, bed linen and utensils for your own use and wash them frequently in hot, soapy water. Heavily soiled items can be soaked first in disinfectant.

Community Responsibility

- Awareness on diseases
- Follow guidelines
- Assure hygiene of foods
- Prepare own foods
- Reduce exposure time
- Identify early signs
- Seek proper treatment
- Good contacts with health services

END

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Water requirement

Divide your weight (in kilograms) by 30

(ex. somebody weighing 70 kg is going to need 2.3 liters per day).

Source of water

1. **Rain**
2. **Surface water : Oceans, Rivers and streams , tanks , ponds & lakes**
3. **Ground water : shallow wells, Deep wells , Springs**

1. Rain

- **Rain water is the purest water in nature. Physically, it is clear, bright and sparkling.**
- **Impurities of rain water:**
- **Rain water tends to become impure as it passes through the atmosphere. It picks up suspended impurities from the atmosphere such as dust, microorganisms and gases such as carbon dioxide, nitrogen, oxygen and ammonia.**

- **2. Surface water**
- **Contaminate from human and animal sources.**
- **Impurities: surface washings, sewage, trade wastes, and drainage from agricultural areas.**
- **Self-purification of river water: dilution, sedimentation, aeration, oxidation, sunlight, plant and animal life, but these agencies are not sufficient to render the water potable.**
- **Water needs purification before it can be used for drinking purposes.**

- 3. Ground water
- Ground water is superior to surface water, because the ground itself provides an effective filtering medium.
- *The advantages of ground water are:*
- (1) It is likely to be free from pathogenic agents;
- (2) It usually requires no treatment;
- (3) The supply is likely to be certain even during dry season;
- (4) It is less subject to contamination than surface water.
- *The disadvantages of ground water are:*
- *It requires pumping or some arrangement to lift the water.*
- Wells: Shallow wells: Deep wells: Springs: