

Low Birth Weight

Article 01 - Series on "Insight into Maternal and Child Health through life cycle approach"

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The Millennium Summit in September 2000 marked a historic turning point for global cooperation. The Millennium Declaration agreed by 189 member countries at this summit, was one of the most significant agreements in the history of the United Nations. It marked an unprecedented global commitment to provide basic human rights and a life with dignity, for people in the most underprivileged sections of society, while respecting and protecting the natural environment, by the year 2015. This identified priorities of mankind for the new millennium and outlined a road map that these nations pledged to follow in consensus by setting the Millennium Development Goals (figure 1.1), each time-bound with 18 quantifiable targets which can be assessed by 48 indicators. MDGs provide a 15 year framework for the international community to enter into a global commitment to work together to ensure that the benefits of development reach all individuals.

The Sri Lankan Situation

Sri Lanka has demonstrated its commitment to achieving MDGs by 2015. Harmonization of the

Millennium Development Goals

government policy, adaptation of strategic planning through 'Mahinda Chinthana', with the global move has been a key

milestone in our success.

Sri Lanka is well on track in achieving most of the MDGs targets by 2015, at the national level (Table 1.1). We have achieved remarkable economic growth (GDP 8.2%- Central Bank of Sri Lanka) which is a key entry into a meaningful poverty reduction, during last decade despite heavy socioeconomic losses related to 30 year old civil unrest. Universal primary education and empowerment of women to achieve gender equity were remarkable milestones and provides role model for other developing nations.

Health indicators that are comparable with developed nations show the dedication and untiring effort of the health staff towards the service delivery.

MDGs and Health

Achieving optimum health is a challenge as direct health interventions alone may not help. Health domain is always linked to many broad social determinants which make it a real challenge. Health sector is

Figure 1.1. MDGs



Table 1.1: Progress of MDG Indicators 1,4 & 5 contd...Page 3

Goal	Indicator	Current Value	Target
1. Eradicate Extreme poverty and Hunger	Prevalence of underweight among children under 5 years	21.4 (DHS-2006/7)	20%
	Under 5 Mortality Rate (per 1000 live births)	10.4 (2007-RGD)	12
4. Reduce Child Mortality	Infant Mortality Rate (per 1000 live births)	8.5 (2007-RGD)	9
	Proportion of 1 year old children immunized against measles	94.9 (DHS-2006/7)	99%
5. Improve Maternal Health	Maternal Mortality Ratio (per 100,000 live births)	33.4 (FHB-2008)	36
	Proportion of Births attended by skilled health personnel	98.6 (DHS-2006/7)	99%

RGD- Registrar General's Department, DHS- Demographic Health Survey

Low Birth Weight

Low Birth Weight (LBW) is defined as birth weight less than 2500g irrespective of the gestational age. LBW in a newborn indicates inadequate foetal growth either resulting from pre-term birth (duration of pregnancy less than 37 weeks from the last menstruation) or poor weight gain for a given duration of gestation (Intra Uterine Growth Retardation-IUGR), or both.

Infants weighing less than 2500 g are approximately 20 times more likely to die than babies with normal birth weight. Cut off value for LBW has been identified based on epidemiological observations for international comparisons. Therefore, this cut off value seems to be a valid parameter in identifying at-risk newborns. Low birth weight may further be subdivided into very low birth weight (less than 1500 g) and extremely low birth weight (less than 1000 g).

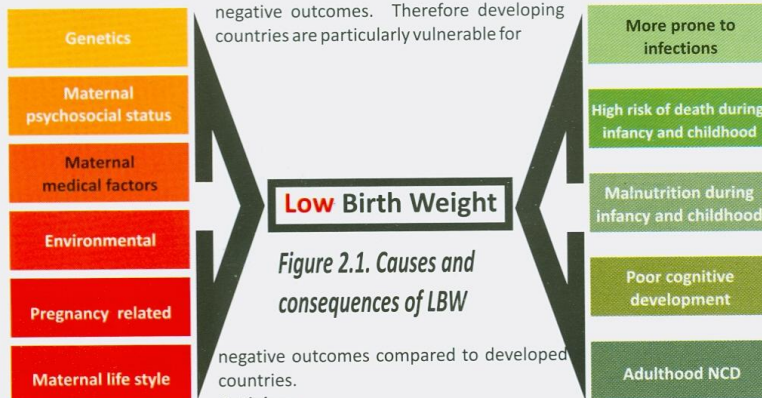
Burden of LBW

Global prevalence of LBW is estimated to be 15.5 % with a remarkable variation (3.3% - 38%) among countries. LBW is more common (95.6%

of all LBW) in developing countries than in developed countries. Half of all LBW babies are born in South-central Asia, where more than a quarter (27 %) of all infants weigh less than 2,500 g at birth. Therefore, LBW is a relatively significant priority for Asian countries in maternal and child health services. The prevalence of LBW in Sri Lanka is 16.6% according to the latest Demographic Health Survey (DHS 2006/07).

LBW is incriminated in a spectrum of complications in the newborn period and thereafter (figure 2.1). Newborns with LBW have a higher susceptibility for mortality and morbidity in foetal life and during neonatal period. Such neonates are more prone to neonatal infections that may present as diarrhoea, respiratory tract infections and these are partly due to impaired immune function associated with LBW.

At subsequent ages, LBW could be a causative agent for inhibited growth and retarded cognitive development. Adolescents and adults born with LBW generally have less strength and lower lean body mass resulting in decreased work capacity and lost productivity. Neurological dysfunction is often associated with attention deficit disorders, hyperactivity, clumsiness and poor school performance. Sequelae of LBW is not completely attributable to implications linked with LBW. The role of environmental factors which could modify the course of LBW could not be underestimated. Socioeconomic status, nutritional status and cultural backgrounds are such factors linked with positive or negative outcomes. Therefore developing countries are particularly vulnerable for



Low Birth Weight

Figure 2.1. Causes and consequences of LBW

negative outcomes compared to developed countries.

Aetiology

Majority of LBW in developing countries are due to IUGR, while most LBW in developed countries is due to preterm birth. Aetiology of prematurity is unknown in most cases although commonly linked with high maternal blood pressure, acute infections, hard physical work, multiple births, stress, anxiety and other psychological factors. Aetiology of IUGR is multi-factorial and causative agents are not easily identified in individual cases. Broadly, aetiology of IUGR is conceptualized under placental, foetal and maternal origins. Growth of the foetus will be retarded in utero if the placenta is abnormally small or blocked causing insufficient nutrients and oxygen to reach the foetus. Foetal genetic or chromosomal anomalies and physical abnormalities are also responsible for IUGR in some cases. However, unlike foetal and placental factors, maternal factors bear relatively high public

health significance as they allow more opportunity to intervene. Maternal factors related to LBW have been identified in several dimensions (Table 2.1).

Interventions

Low birth weight births constitute a major health problem for the individual infant, their families and the society that needs an urgent intervention. Actual cost of LBW remains underestimated. In addition to direct cost of care for complications of LBW, indirect costs of LBW is yet to be highlighted at individual and community level. Social costs of LBW, long-term neuro-development impairments and learning disabilities are much higher than anticipated and we are yet to give due recognition for the burden of LBW.

Aetiological factors responsible for each case of LBW is not identified easily due to multi-factorial causality of LBW. However, maternal causes are found to be responsible for substantial proportion of cases with LBW in developing countries. Fortunately, most of

the maternal causes could be identified early and this is reinforced the concept that interventions can begin before the prenatal period. Table 2.2 summarizes some targeted interventions helpful in combating LBW.

Despite many unanswered questions about causation and the interplay of important risk factors, policy makers and public health professionals

have enough information at present to intervene. Some useful approaches include placing greater emphasis on identifying and reducing risk factors before pregnancy, increasing the accessibility of early and regular high quality prenatal care for all pre pregnant women, enriching the content of prenatal care endowing it with sufficient flexibility to meet the need of both high and low risk women and developing a long term public information programme to convey messages about ways to reduce low birth weight.

This is an area in which public health workers could play an enormous role with positive hopes. Their roles will not be restricted to identification and referral of

Table 2.1. Maternal Causes of Low Birth Weight

<p>Genetics Genetic conditions and syndromes Maternal LBW Minority Race/ethnicity</p> <p>Maternal psychosocial status Stress (acute and chronic) Anxiety Maternal depression Poor family support Domestic violence/abuse</p> <p>Maternal medical factors Maternal asthma Maternal renal insufficiency Pregnancy associated conditions:- - Hypertension (Chronic hypertension,PIH, pre-eclampsia) - Diabetes (Chronic or gestational) Infections : Rubella, Malaria, Syphilis,UTIs, Bacterial vaginosis,HIV, Periodontal disease</p> <p>Environmental Indoor air pollution (Tobacco, biomass gas)</p>	<p>Nutritional Short maternal stature Low prepregnancy weight Prepregnancy BMI <18.5kg/m² Inadequate maternal weight gain during pregnancy Micronutrient deficiencies</p> <p>Pregnancy related Adolescent pregnancy Short (<18m) or long (>60m) inter-pregnancy intervals Unmarried women Multiple foetuses Uterine abnormalities Cervical incompetence H/O preterm/LBW births</p> <p>Maternal lifestyle Tobacco use Prenatal exposure to alcohol Caffeine use</p>
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Reference: IHE Report 2008

vulnerable persons for further care. As highlighted in table 2.1, most of the maternal causes are linked to broad and complex socio-cultural and economic determinants and also emphasize the importance of behavioural and environmental risks where interventions should go beyond medical care. Therefore, the approach taken by the public health worker should be smarter which needs “out of the box thinking” in combating the burden of LBW. Multi disciplinary approach and team work combined with good collaboration between curative and preventive health sector would be an ideal mix in approaching LBW meaningfully. Public health worker should adapt a holistic approach in laying foundation. Overall health development based on Millennium Developmental Goals (MDGs) provide holistic framework for sustainable approach in addressing LBW.

Table 2.2. Interventions to reduce low birth weight

1. Behavioural change interventions in communities and health facilities
2. Provision of micronutrient supplements
3. Early identification and intervention of maternal malnutrition
4. Targeted nutrition support (eg. Energy and protein supplementation)
5. Identification and treatment of preventable medical causes.

Public health leadership and challenges ahead

The public health sector has played a commendable role in achieving high standard of health care in the nation which is clearly visible by many of the MDG indicators under review. Extensive network of public health staff, well-organized administrative structure and technical expertise underpinned this success. However, inter-district disparities, situation in disadvantaged/vulnerable sub communities which lay hidden behind the national average challenge the universal achievement (figures 1.2 & 1.3). Further, the scope of the MDGs encompasses not only health domains but other domains which indirectly influence health. The grassroot level public health team headed by the MOH has responsibilities towards its respective community and is in a better position to take up these challenges. They have the privilege to collaborate with many non health sectors in a multidisciplinary environment. They maintain links with regional administration, education system, legal system and other state and non governmental organizations. Thus, their unique position enables them to intervene health issues in the community in a broader sense extending their services beyond routine health services. MDGs provide a fine framework for public health staff to conceptualize their services.

Millennium Development Goals cont . . .

directly responsible for goals 4, 5 and 6. However, majority of other goals have strong ties to the health domain in a broader perspective.

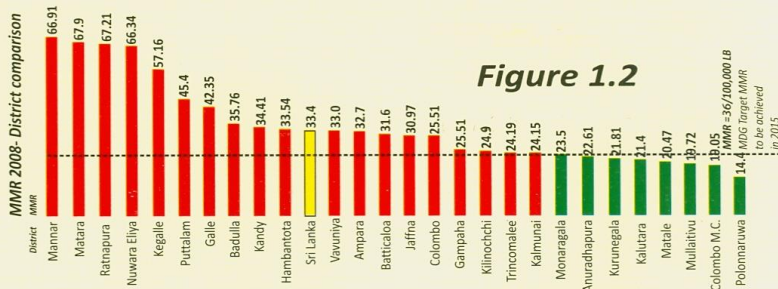


Figure 1.2

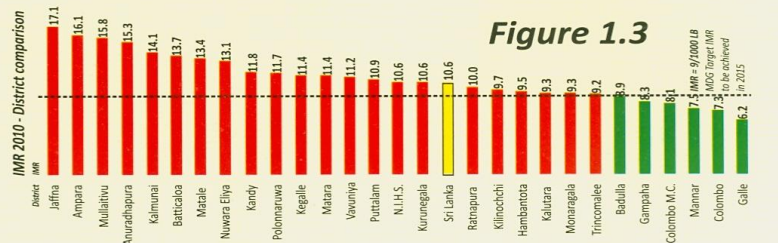
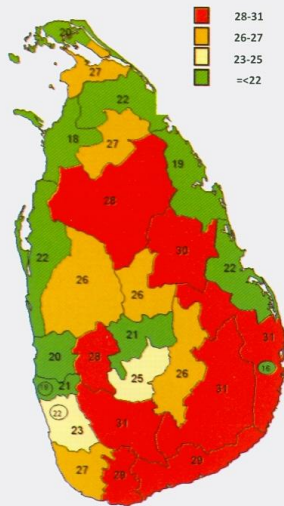


Figure 1.3

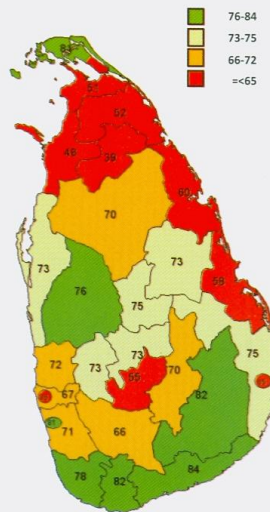
Quarterly District MCH Performances

Source - H-509 2011 2nd Quarter

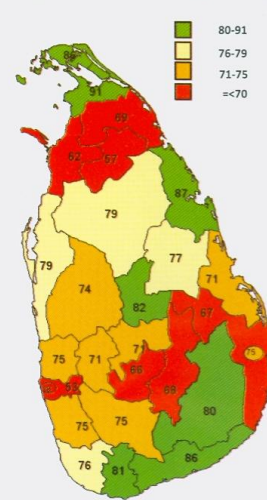
Percentage of pre-pregnancy low BMI
(National average 22%)



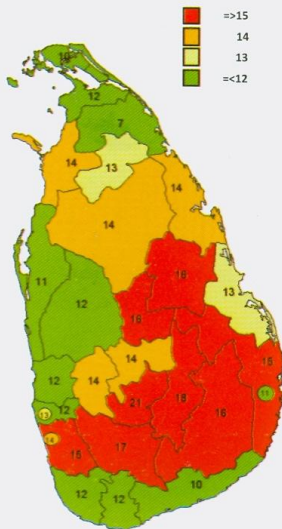
Percentage of pregnant mothers registered before 8 Weeks
(National average 72%)



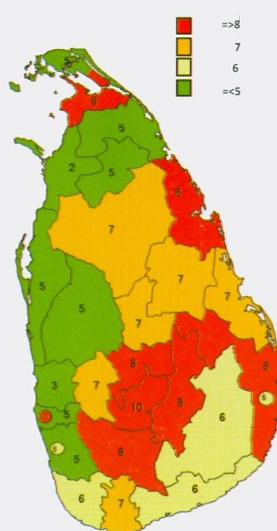
Percentage of mothers receiving post-partum visits by PHM (at least one) during first 10 days
(National average 62%)



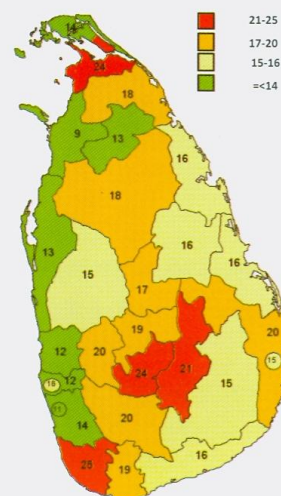
Percentage of Low Birth Weight
(National average 13.8%)



Percentage of underweight among infants (-2SD to -3SD)
(National average 5.8%)



Percentage of underweight among 1-2 years aged children (-2SD to -3SD)
(National average 16.8%)



* Data for Colombo Municipal Council, National Institute of Health Sciences and Kalmunai areas are encircled.