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National Maternal Death Surveillance and Response: Sri Lankan scenario

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Loss of a woman in the reproductive age has a lasting impact on the family and the society, with a multitude of socioeconomic implications, which often cause deleterious effects at different levels, even many years later. Given the relevance of maternal deaths, many countries across the world have implemented National Maternal Death Surveillance and Response mechanisms [1]. Around each maternal death there are 10-20 women who develop severe acute maternal morbidity, where very ill pregnant or recently delivered women, who would have died had it not been that luck and good care was on their side, survive with immediate and/or long term adverse sequelae [2, 3].

The world loses 830 women every day due to complications of pregnancy and child birth. During the past two decades, the global maternal mortality ratio (MMR) declined by 44%, from 385 to 216 deaths per 100,000 live births. Yet this was below the target set by the millennium developmental goals (MDG 5) which envisaged a reduction of 75% in the MMR by the year 2015 from that of 1990 [4].

The process to reduce global maternal mortality is continuing, and the initiatives are led by the United Nations Maternal Mortality Inter Agency Group which formulated the sustainable development goals (SDG) to be implemented from 2016 and 2030, which target a global maternal mortality ratio of less than 70 per 100 000 live births by 2030, with no country having a MMR of 140 maternal deaths per 100,000 live births [5, 6].

Sri Lanka introduced a Maternal Death Surveillance and Response system (MDSR) in 1981. In 1985, the gazette regulation on mandatory notification of probable maternal deaths was issued, and a structured review of maternal deaths was initiated by Family Health Bureau (FHB) in 1995 with inputs from professional colleges. In 2000, a national maternal death database was established [7]. Every year, of the 360,000 pregnant women who are registered, over 99% receive antenatal care and 99.5% are attended by a skilled birth attendant during confinement. Sri Lanka reported a MMR of 1694 per 100,000 live births in 1947 which gradually declined to reach one of the lowest in the South Asian Region by the turn of the millennium. However, the MMR in the country remains static from 2010 to 2017 fluctuating between 31-39 deaths/100,000 live births [8].

Sustainable Developmental Goals (SDGs) for Sri Lanka are to reduce the MMR to 25 per 100,000 live births by 2020, 15 per 100 000 live births by 2025 and to less than 10 per 100 000 live births by 2030 [9]. This would mean the



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occurrence of less than 30 maternal deaths in 2030 if the current number of births does not change significantly.

In 2017, 127 deaths were identified as maternal deaths out of the 215 deaths reported to the National MDSR system; a national maternal mortality ratio of 39.0, up from 33.8 deaths/100,000 live births reported in 2016. This shift was largely due to complications of dengue and influenza (38 maternal deaths). If not for these epidemics, a MMR of 27.3 per 100,000 live births could have been achieved.

There is a notable reduction of cause specific MMRs of direct maternal deaths over the last 15 years in areas like Pregnancy Induced Hypertension and Acute Fatty Liver of Pregnancy. This reflects the wider availability of institutions with comprehensive obstetric care, the quality of obstetric care delivered at hospital level, and timely referrals to hospitals by field teams.

In the year 2017, the number of maternal deaths due to direct and indirect causes were 45 and 82 respectively. Dengue haemorrhagic fever (DHF) was included as an indirect cause of maternal death in 2016 and was the single most common cause in 2017 accounting for 21 deaths. Other leading causes of indirect maternal deaths were; cardiac diseases (20), respiratory diseases including influenza (17), and malignancy (6). Obstetric haemorrhage (12), sepsis (9), septic abortion (8), hypertensive disorders (6), amniotic fluid embolism (5), and thromboembolism (3) accounted for the majority of direct maternal deaths.

Strategies to overcome viral diseases would have a major impact on MMR in the years to follow. Health education on early presentation, improved diagnostics and evidence based management in specialized institutions would be the way forward to overcome these new challenges. Deaths due to cardiac diseases which accounted for 20 maternal deaths in 2017 as compared to 11 in 2016, may be due to unmet need of contraception. A multidisciplinary team approach in the pre pregnancy period involving obstetricians, primary care providers, cardiologists and anaesthesiologists is the key to reducing these deaths.

Nearly 70% of the maternal deaths in 2017 were categorized as preventable. Majority of the 22% who conceived as a result of unmet need for contraception would have survived if this need was met. Older women accounted for 23% of deaths. Some issues surrounding maternal deaths were complex social scenarios which are beyond the boundaries of health care provision. These complex issues lead to delays in seeking health care, which were evident in 57% of maternal deaths in 2017. It is prudent that these issues are addressed by relevant stakeholders through meaningful actions to empower women.

Other issues include infrastructure disparities and maldistribution or shortage of health care personnel, both at field and institutional levels. This is shown by the consistently high MMR in some districts with service deficiencies. The changing risk profile of the population such as pregnancies in the extremes of reproductive age,

defective dietary habits, and sedentary lifestyle are also contributory factors [10].

Suboptimal care either at field or hospital levels contributed to 38% of maternal deaths in the year 2017. Gaps in field service delivery, deficiencies in basic clinical services, non-adherence to protocols and standard practice, were evident. Empowerment of all categories of care givers, through continuing professional development and formal training to improve knowledge, skills, professional attitude and mindset, is pertinent [11]. Non-availability of 24/7 facilities such as blood banks and laboratory services, rising caesarean section and induction rates, failure of early involvement of multidisciplinary teams were also of concern [12, 13].

Several quality improvement measures and specific recommendations were adopted following 2017 National Maternal Death Surveillance and Response process. Quality improvement measures are often subtle and simple; speedy communication between middle level medical officers and the obstetrician before getting into clinical difficulties, observing for danger signals by junior staff and informing the seniors immediately, proper documentation, early involvement of multidisciplinary teams, promotion of the use of effective tools such as the partogram and modified early obstetric warning system charts, and effective communication with the field staff when the parturient leaves hospital, are some of the areas that were emphasized.

Specific recommendations that were implemented include; early admission of pregnant women with fever facilitating shared specialist management of DHF and respiratory diseases from the very outset, focused counselling on avoiding conception among women with medical contraindications for pregnancy, dealing with misconceptions of administering contraception to needy women with chronic medical diseases, encouraging referrals to family planning clinics to address medical eligibility criteria for contraception, capturing women in danger at the field settings by the implementation of Register of Eligible women in Danger (RED book), educating field midwives in identifying psychological issues, health education for family members regarding psychological issues, establishment or strengthening of existing support groups, improving communication between peripheral hospitals and specialist units when transferring women for specialized management and during back referral, and effective quality assurance system to monitor private hospitals as well as the government hospitals.

In the MDSR system, an index case will be discussed with the participation of national level experts in the following year. This limits opportunities for timely interventions or actions by higher level authorities. To address the issue, Ministry of Health responded by introducing a new modality, "Immediate Response to Maternal Deaths". These reviews should lead to immediate remedial actions.

Every year 25-30 women commit suicide during the pregnancy or within one year after delivery. All these deaths are reviewed by a team led by a consultant psychiatrist using a Psychological Autopsy Tool at field level. This is a positive approach which helps translation of outcomes into policies, programs and practices with a view to prevent such deaths. Some of these deaths are not reflected in the MMR as not all deaths associated with complications of pregnancy, child birth, and puerperium are classified as maternal deaths if these do not meet the criteria for inclusion [14].

It is of importance that the process of National Maternal Death surveillance and Response is strengthened further and transformed into a confidential inquiry. A complementary approach is to enquire into severe acute maternal morbidity, where a woman who nearly died but survived a complication that occurred during pregnancy, childbirth or within 42 days of termination of pregnancy. In practical terms, these are women who survive life-threatening conditions involving organ dysfunction [15, 16]. Although Sri Lanka has already implemented this strategy, a meaningful analysis is yet to be done.

Whilst Sri Lanka could be proud of her achievements made so far as a low resource country in terms of maternal care, which are largely due to the country's will in promoting 'universal free health', much remains to be done and complacency at all levels should be avoided if further progress is to be achieved. The stagnant maternal mortality ratio over the last 10 years is a concern in an environment with almost universal provision of antenatal care and institutional confinements. Comprehensive analysis of immediate contributory factors and in-depth exploration of distant correlates of maternal deaths and near misses with a preventive focus would contribute towards improved maternal outcomes. More home grown innovations probably appear to be the way forward in overcoming a literal 'middle income trap' in the health care sector.

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P S Wijesinghe, Department of Obstetrics and Gynaecology, Faculty of Medicine, University of Kelaniya, **Kapila Jayaratne**, Maternal and Child Morbidity and Mortality Surveillance Unit, Family Health Bureau, Ministry of Health, **Dimuth Peiris**, Maternal and Child Morbidity and Mortality Surveillance Unit, Family Health Bureau, Ministry of Health, Sri Lanka.

Correspondence: PSW, email: <prasanthaw@kln.ac.lk>