

Outcome of Maternal Death Surveillance and Response – 2019

Counting and reviewing maternal deaths contribute to further reducing such deaths. Maternal mortality is globally accepted as a quality indicator of the overall health of a population in a country depicting the status of women and the functioning of the healthcare delivery system.



A structured Maternal Death Surveillance and Response mechanism is in operation covering the entire country with data originating from both community and facility levels. This process was started way back in 1981. The review process evolved over the years with the addition of numerous quality dimensions. In the present system, when a probable maternal death is known, field and hospital health staff notify, conduct post-mortems, review the index death at field and hospital levels and send a detailed report to Family Health Bureau (FHB). At FHB, the Maternal & Child Morbidity and Mortality Surveillance Unit maintains a database and comprehensive case scenarios are developed. These cases are then desk reviewed by an expert panel comprised of different specialties related to maternal care service provision. A national team of experts from related specialties visit each and every district in the following year to conduct National Maternal Mortality Reviews (NMMR) at district level with the participation of all concerned stakeholders. Each maternal death is reviewed based on 3 delays – (deficiencies in seeking healthcare, reaching and treating), and lessons learnt are translated into practice, programs and policies at district and national levels.

Maternal Mortality Ratio (MMR) is the most widely used measure of maternal deaths. MMR assesses obstetric risk (i.e., the risk of dying once a woman is pregnant). It is calculated as the number of maternal deaths per 100,000 live births.

Sri Lanka reported an MMR of 1694 per 100,000 live births in the year 1947 and gradually reduced the same over the last few decades to achieve the best MMR in the South Asian Region.

Definition of a Maternal Death

Maternal Death

Death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and the site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes.

In the year 2019, the field health staff registered and cared for 3,903,306 eligible families all over the country and registered 341,745 pregnant mothers. Antenatal care was provided to 95.4% of them and 99.9% of women delivered in a hospital.

Family Health Bureau was notified of 169 probable maternal deaths during the year 2019. Comprehensive information from family, field, hospital and medico-legal sectors were compiled to develop case scenarios. District-wise categorized cases were subjected to a national level district review with the participation of related experts. National Maternal Mortality Reviews at the district level (in physical modality) were conducted for 25 health regions despite the challenge of Covid19 pandemic situation. Review of maternal deaths of Colombo district was held as a desk review. Review of all maternal deaths (100%) was completed by September 2020.



In addition, seven (07) Immediate Response to Maternal Deaths meetings were conducted for 36 cases with issues chaired by Director General of Health Services for system improvements.



In the year 2019, out of reported maternal deaths, 93 deaths were categorized as maternal deaths giving a national Maternal Mortality Ratio (MMR) of 29.2 per 100,000 live births (Figure 1). Live births reported by the Registrar General's Department for the year 2019 was taken as the denominator (319,010). It is notable that there was a substantial reduction of live births (9,102) in the denominator (2018 - 328,112).



Figure 1: Calculation of MMR 2019

Figure 2 illustrates the number of reported and confirmed maternal deaths from 2001 – 2019. Though there is a gradual reduction in the number of maternal deaths over the years, the number has been almost stagnant during the period 2014 - 2016. A significant rise was noted

in the year 2017 mainly due to higher number of deaths of Dengue Haemorrhagic Fever (n=21) as a result of the country-wide epidemic contributing to the maternal death profile. It is noteworthy the substantial reduction of number of maternal deaths (n=35, 27%) over the years 2018 & 2019.

Sri Lanka's Maternal Mortality Ratio (MMR) reduced over the years to reach a level well below the MMR of other South Asian countries and to be on par with high income countries. Figure 3 shows the trend of MMR from 2001 – 2019. However, similar to the number of maternal deaths, the MMR has also been stagnant since 2010 to 2017. A sizeable reduction of MMR, by nearly 10 points, is visible from 2017 to 2019.

Figure 2: Number of Maternal Deaths (2001 – 2019)

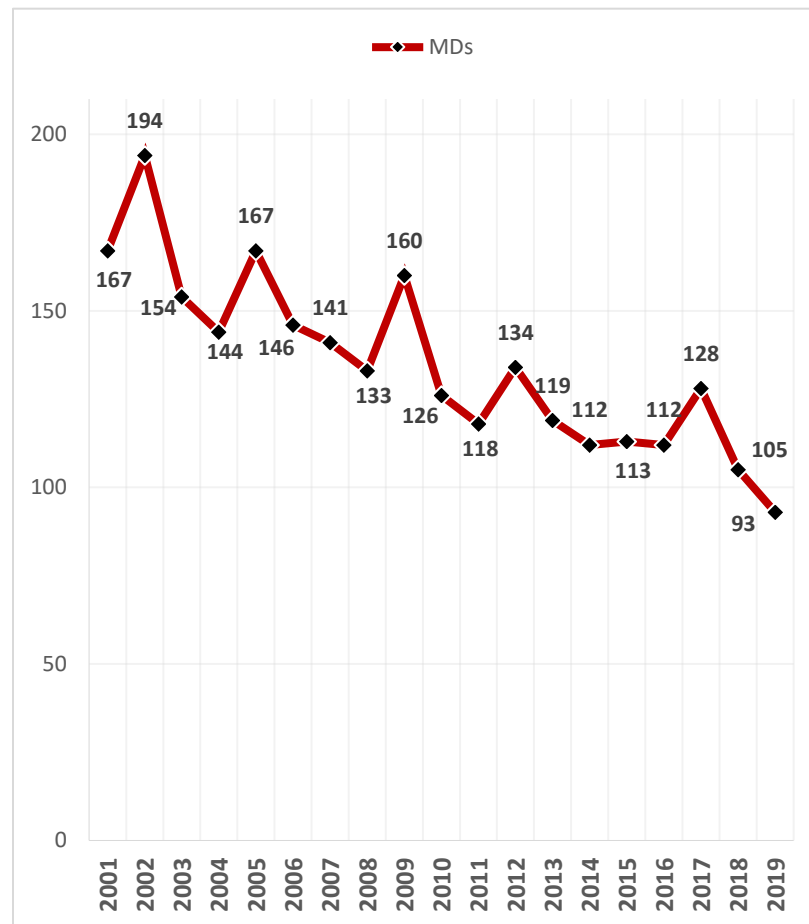
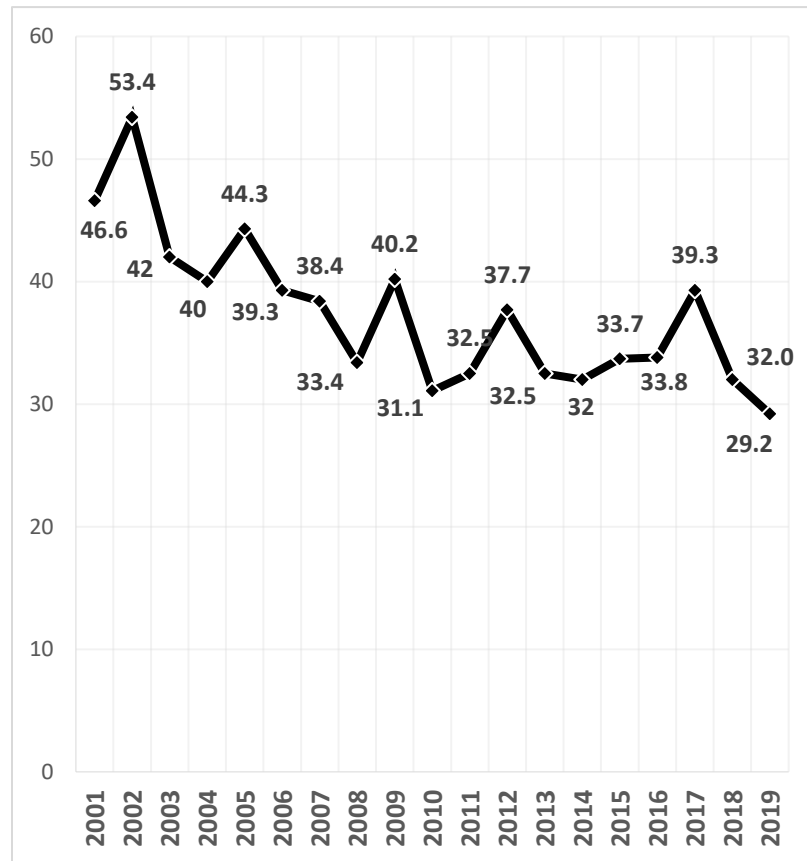


Figure 3: Maternal Mortality Ratio from 1995 - 2019

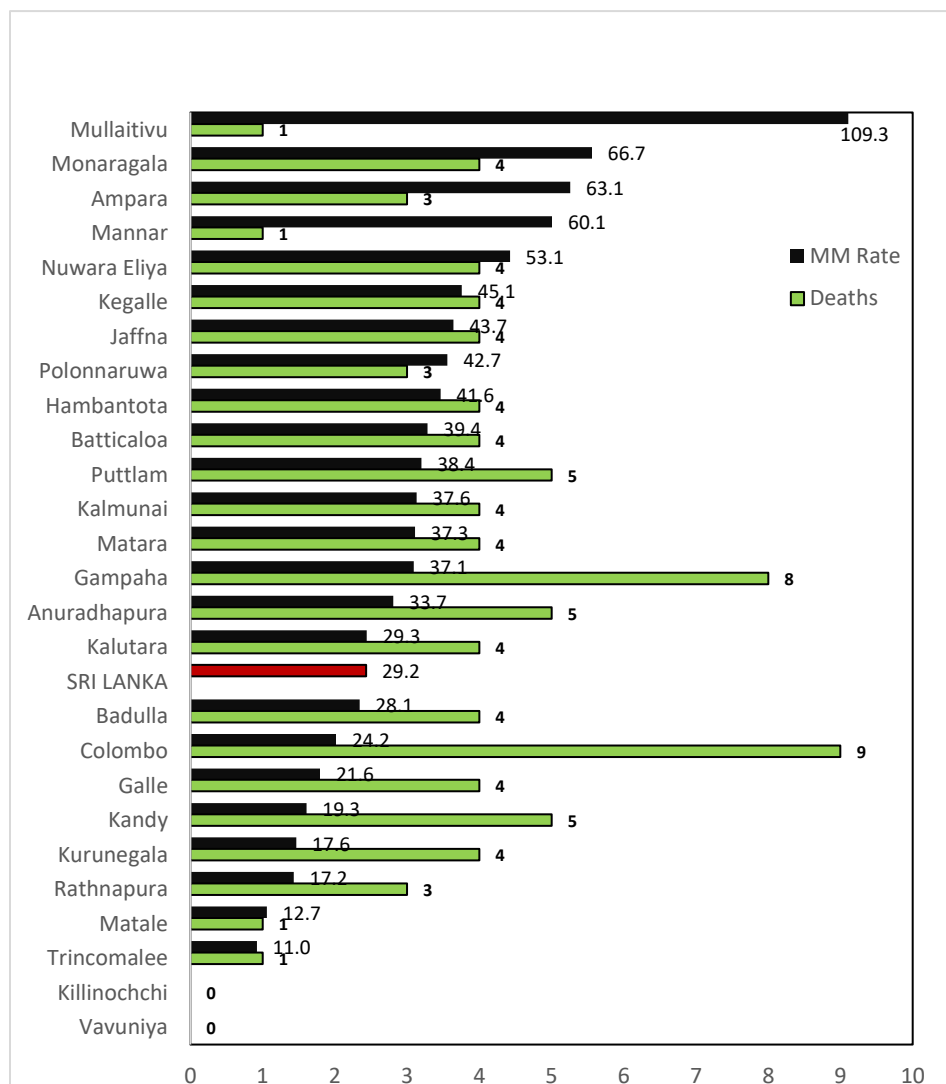


Source: Maternal & Child Morbidity & Mortality Surveillance Unit - Family Health Bureau

Figure 4 shows number of deaths and MMR of each district based on the live births reported by Registrar General's Department. A wide district disparity is evident with 16 districts reporting their district MMRs above the national value. The highest MMR was reported from Mulativu district (109.3 per 100,000 live births). Other leading districts are Monaragala, Ampara, Mannar and NuwaraEliya. Higher number of maternal deaths were reported from Colombo (9) and Gampaha (8) districts.

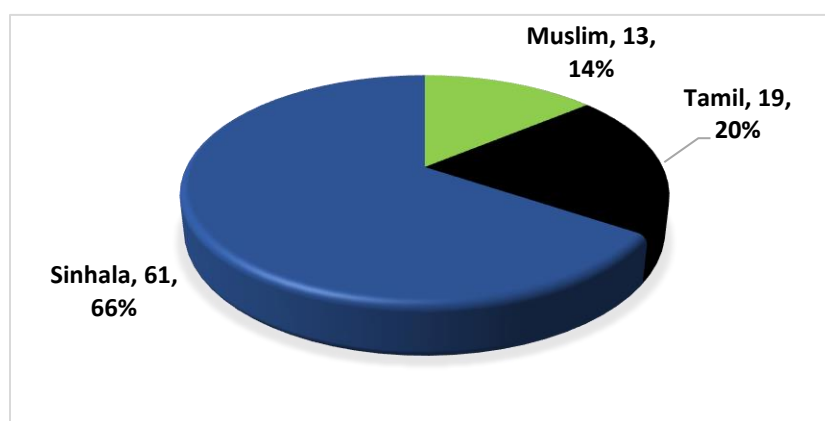
Dead women were from rural (n=67, 72%), urban (n=21, 23%) and estate (n=5, 5%) sectors. Ethnic composition reveals Sinhala (n=61, 66%), Tamil (n=19, 20%) and Muslim (n=13, 14%) women (Figure – 5).

Figure 4: Maternal Deaths and MMR by District - 2019



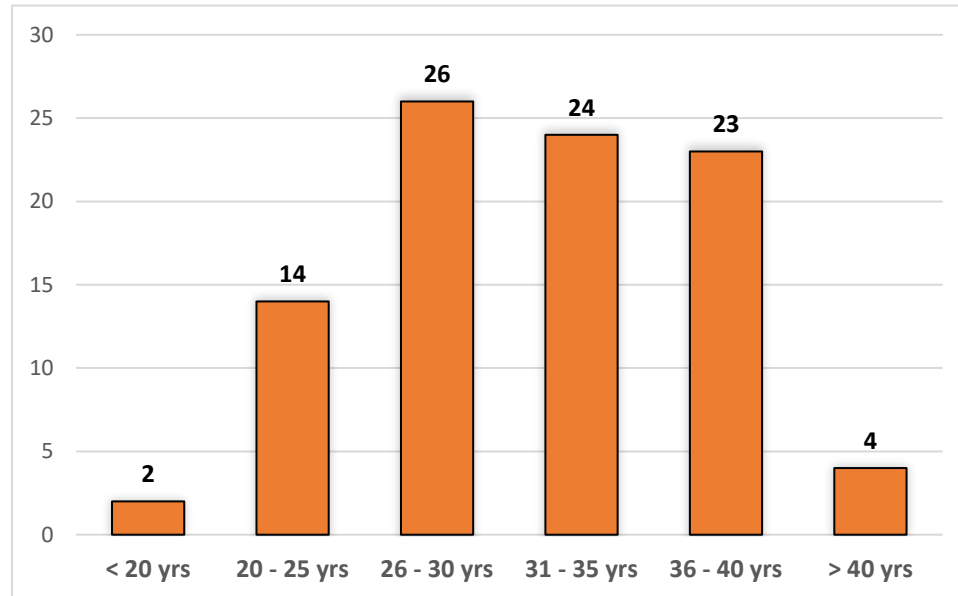
Source: Maternal & Child Morbidity & Mortality Surveillance Unit - Family Health Bureau

Figure 5: Ethnicity of the dead women - 2019



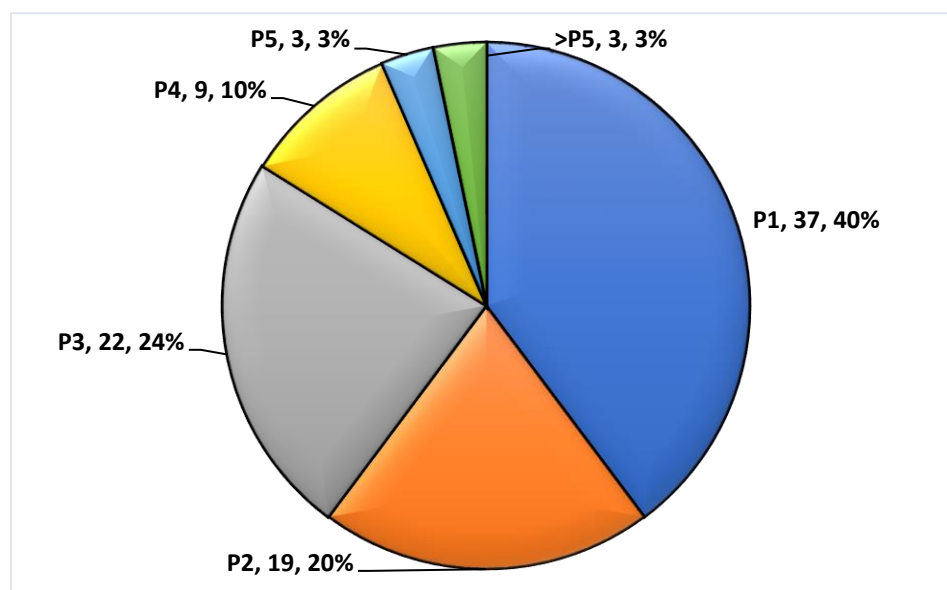
All except one woman was unmarried. There were only two (2) teenage maternal deaths. Majority (n=64, 69%) were in the 20 – 35 year age group. It is highly significant that twenty seven (29%) women were above 35 years of age (Figure 6).

Figure 6: Age of the dead women - 2019



Nearly forty percent (n=37, 39.8%) of the dead women were primies and an exactly a similar proportion (n=37, 39.8%) were in their 3rd or more pregnancy (Figure 7). Many (n=42, 45%) had no living children. Ten (11%) women had three or more children. Nineteen (20%) women reported unmet need of family planning.

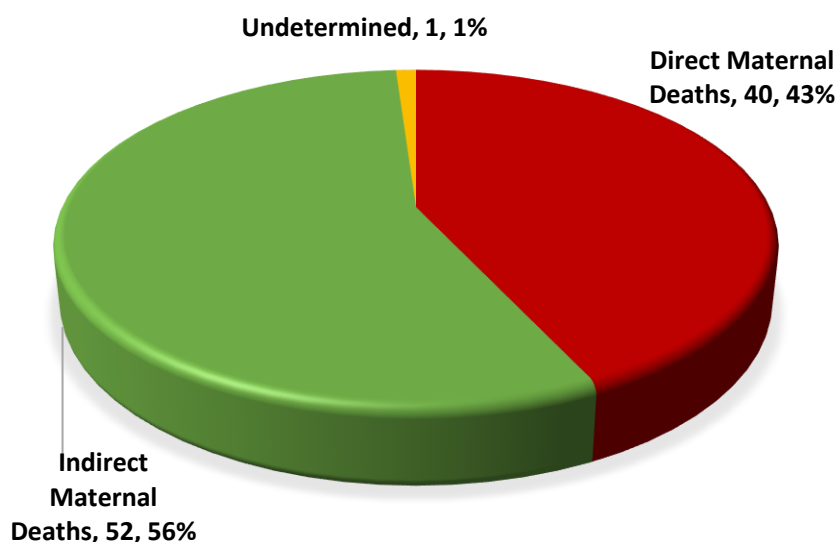
Figure 7: Parity of the confirmed maternal deaths - 2019



Maternal deaths are categorized into two groups, direct and indirect. Direct obstetric deaths result from obstetric complications of the pregnant state (pregnancy, labor, and puerperium), from interventions, omissions, incorrect treatment, or from a chain of events resulting from any of the above. Indirect obstetric deaths result from previous existing disease or disease that developed during pregnancy and which was not due to direct obstetric causes, but which was aggravated by physiologic effects of pregnancy.

A majority (n=52, 56%) of the deaths were indirect maternal deaths while 43% (n=40) were direct and 1% (n=1) were uncertain (Figure 8).

Figure 8: Category of maternal deaths - 2019

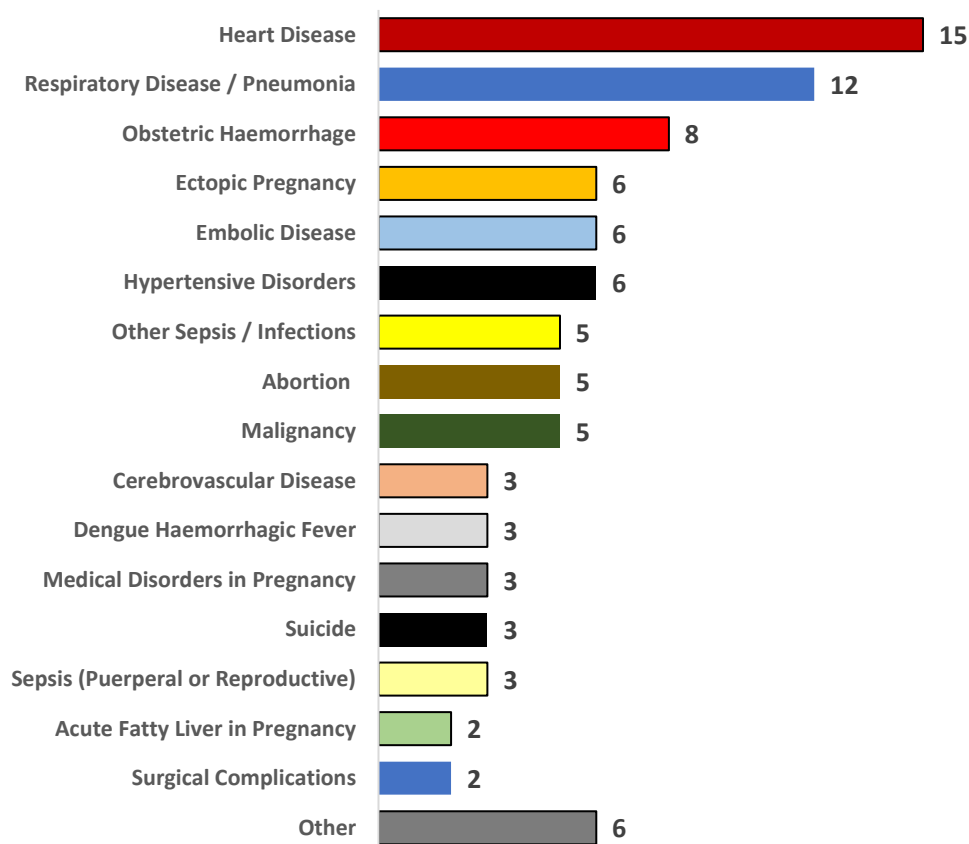


Conducting post-mortems on all probable maternal deaths is mandatory as governed by the circulars issued by Ministry of Justice to all coroners and Ministry of Health to all hospital heads. Availability of pathological features and underlying cause of death significantly support the final determination of the cause of death of the index case by the expert panel following a consensus reaching process. In the year 2019, the coverage of conducting post-mortems on confirmed maternal deaths was 96% (n=89).

Causes of the maternal deaths reported in 2019 are indicated in figure 9. The leading causes were heart disease (n=15, 16%), respiratory disease (n=12, 13%) and obstetric haemorrhage (n=8, 9%). These three causes were rotating over the past few years as the leading causes of maternal deaths in the country.

Further analysis of deaths due to heart disease reveals that 6 & 3 deaths were due to Rheumatic Valvular Heart Disease and Ischaemic Heart Disease respectively. Of the 12 maternal deaths due to Respiratory Diseases, 10 were due to pneumonia. Influenza virus was attributed to 5 pneumonia deaths. Causes of deaths due to obstetric haemorrhage include four post-partum haemorrhage (one home delivery), two uterine rupture and two abnormally-adherent placentae.

Figure 9: Causes of maternal deaths - 2019



A notable reduction of liver disease in the index year is apparent. Out of the maternal suicides reported in the index year (n=24), only indirect and direct cases which fulfill the maternal death definition (n=3) were included in the analysis.

Figure 10 shows the progression of the cause-specific MMRs over the last two decades. Notably, many of the direct causes (obstetric haemorrhage, hypertensive disorders, liver disease and septic abortion) indicate a significant reduction. However, the indirect causes (mainly heart disease and respiratory disease) remain fluctuating at higher levels.

Figure 10: Cause-specific MMRs 2001 - 2019

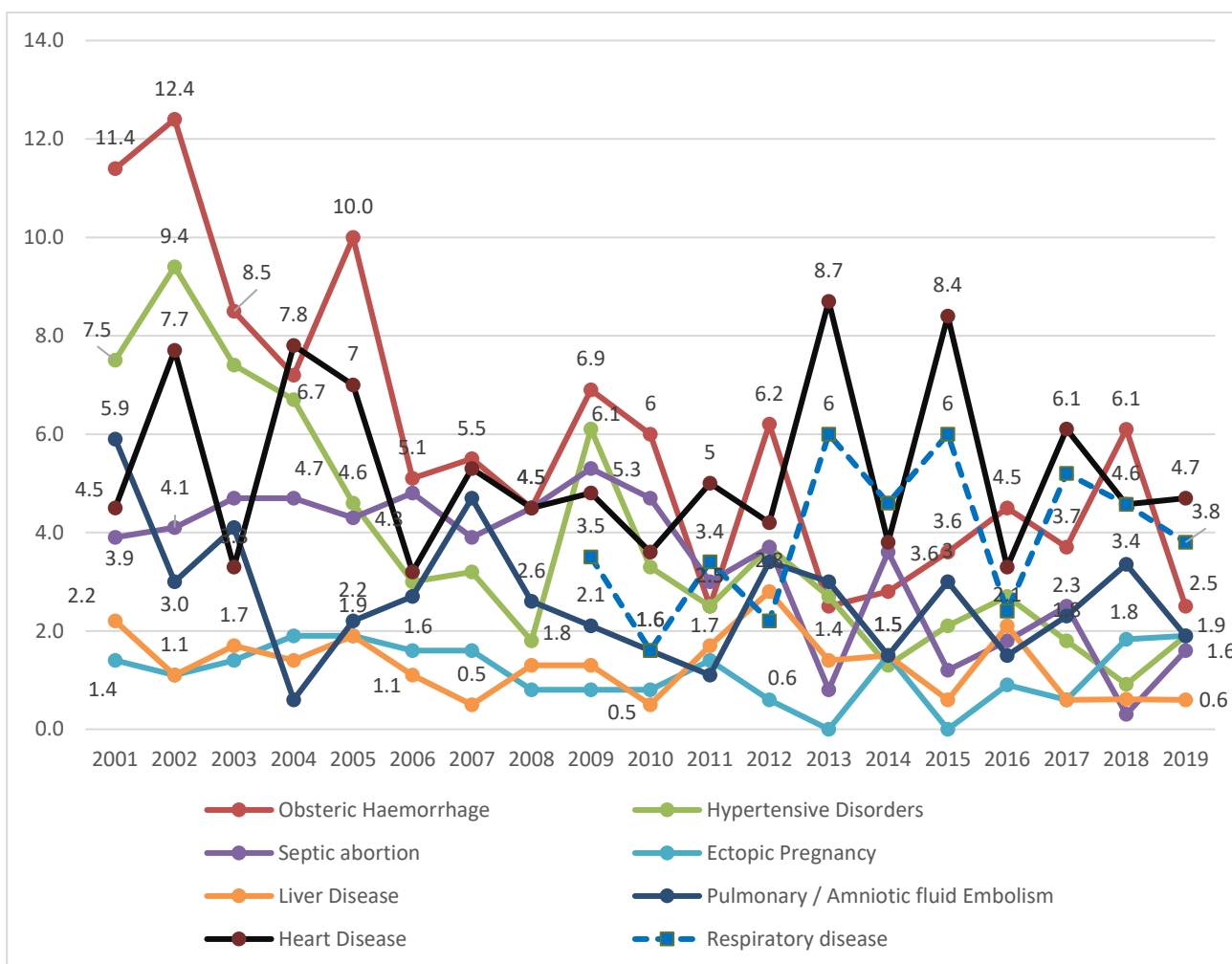


Table 1 shows the mode of delivery of the index women. They have undergone operative delivery in 41 (44.1%) cases and senior involvement in such situations is significant.

A majority (n=75; 81%) of women were cared at a hospital before they died (Table 2). Eleven (11) women were pronounced dead on admission to a hospital. Out of the women died at a hospital, a majority (n=38; 41%) died at a teaching or a provincial general hospital and 36 (39%) at a base or a district general hospital. One death was reported from a private hospital.

Table 1: Mode of delivery

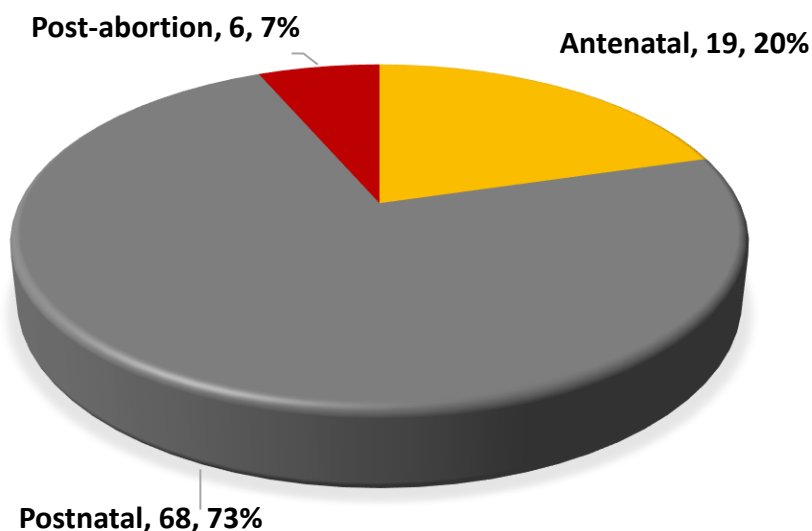
Mode of delivery	n	N	%
Vaginal Delivery		28	30.1
Forceps	3		
Routine	18		
Vacuum	2		
Unassisted	5		
Operative Delivery		41	44.1
LSCS - Elective	8		
Done by VOG	4		
Done by SHO	4		
Emergency Laparotomy	1		
Done by VOG	1		
Emergency Hysterotomy	2		
Done by VOG	1		
Done by Registrar	1		
LSCS - Emergency	25		
Done by VOG	13		
Done by Registrar	1		
Done by SHO	9		
Not mentioned	2		
LSCS - Perimortem	5		
Done by VOG	2		
Done by SHO	3		
Not Delivered		24	25.8
Total		93	100.0

Table 2: Place of death

Place of death	N	%
Home	4	4.3
In transit	3	3.2
Death on Admission	11	11.8
Hospital	75	80.6
Base Hospital	14	15.1
District General Hospital	22	23.7
Provincial General Hospital	3	3.2
Teaching Hospital	35	37.6
Private Hospital	1	1.1
Total	93	100.0

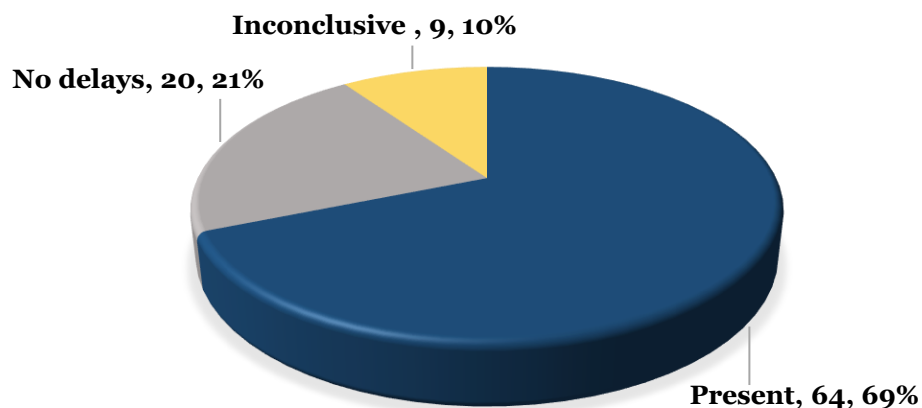
Figure 11 shows the timing of the maternal deaths. Nearly four fifth (80%) of the deaths had occurred after delivery. Only 20% of the deaths were antenatal.

Figure 11: Timing of maternal deaths - 2019



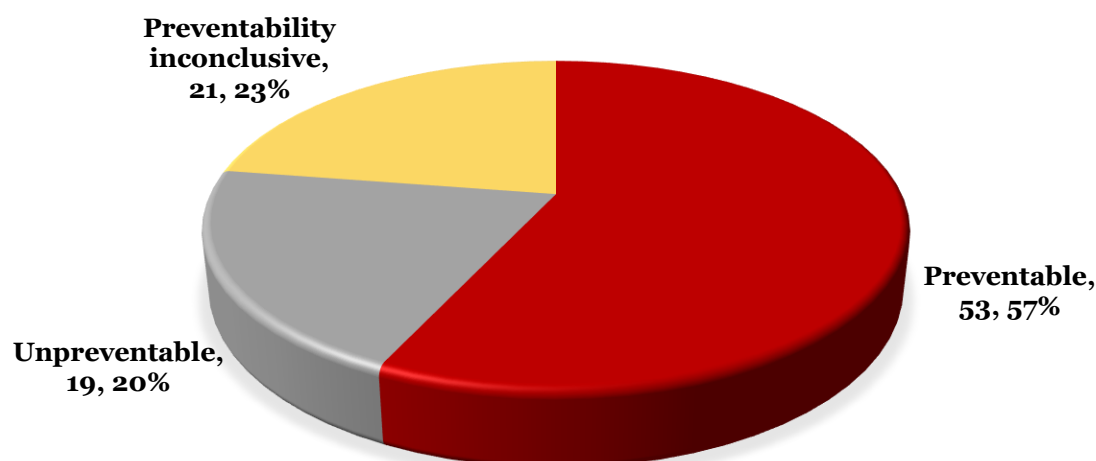
Delays in seeking, reaching and treating (Three delays) were assessed in confirmed maternal deaths. Delays were identified in 64 (69%) deaths (Figure 12). Delay in seeking care was attributable to 46 (50%) cases. Suboptimal care provision, both at field and hospital, was revealed in 39 (42%) cases.

Figure 12: Presence of delays



Preventability of the confirmed maternal deaths were assessed by the reviewing expert panel after reaching a consensus. Out of the 93 maternal deaths reported, 53 (57%) were categorized as preventable and 19 deaths (20%) as unpreventable (Figure 13).

Figure 13: Preventability of maternal deaths



At each district level national maternal mortality reviews, all these cases (100%) were discussed, deficiencies were identified and the recommendations were formulated. Details were included in structured maternal mortality review minutes for all districts (100%) and disseminated to all stakeholders.

Acknowledgements:

Sri Lanka College of Obstetricians and Gynaecologists (SLCOG) played a pivotal role in contributing to reviewing cases at national level and expert review at district level. Professional colleges of Anaesthesiologists and Forensic Pathologists also contributed in the maternal death review process.

Maternal and Child Morbidity and Mortality Surveillance Unit of FHB collated all documents related to index cases, compiled case scenarios, conducted national maternal mortality reviews, sent minutes of the reviews, processed data, analysed data and disseminated the outcome among all stakeholders.

At the health region level, Regional Director of Health Services (RDHS), hospital heads, Medical Officer – Maternal & Child Health (MOMCH) and Medical Officer of Health (MOH) coordinated maternal mortality surveillance and conducting NMMRs.

Compiled by: Dr. Kapila Jayaratne
Maternal & Child Morbidity & Mortality Surveillance Unit
– Family Health Bureau, Ministry of Health Sri Lanka

