

## Review Article

### Maternal Mortality: Interesting Comparison between Tertiary, Secondary and Primary Centers in Pakistan

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#### Abstract

**Objectives:** To highlight the current situation on maternal mortality rate and to compare maternal mortality at different health levels like Tertiary, Secondary and Primary Centers.

**Methods:** Data was collected from different Tertiary, Secondary and Primary centers from their respective hospital administration for the year 2016. In our study 60 (20 Tertiary, 20 Secondary and 20 Primary) Hospitals were randomly selected from different districts of Pakistan.

**Results:** Maternal Mortality Rate reported from different hospitals varies between Tertiary, Secondary and Primary centers. In our study we observed 135 Maternal Mortality Rate in primary, 394 in secondary and being highest in tertiary care center i.e. 452. Each and every tertiary center in Pakistan is serving a large population as Punjab being the biggest and thickly populated province has only 23 Tertiary Care Hospitals, which are serving above 110 million populations. Total Maternal Mortalities reported in these 60 hospitals were 1061. Out of these 1061 deaths 928 (87.46%) were due to direct causes and 133 (12.5%) due to indirect causes. Major contributions in direct causes were haemorrhage, hypertension and sepsis.

**Conclusion:** Our results concluded that increased Maternal Mortality Rate in Tertiary Centers was due to increased referral from Primary and Secondary centers. Regarding these hallmarks our suggestions are to develop strategies which should include increased number of tertiary centers and upgrading of secondary centers with more skilled staff and equipped emergency obstetrics services including blood bank facilities. Government should make pro-active and aggressive attempts at all health care levels to reduce the need for referral to tertiary centers and minimize maternal mortality.

**Keywords:** MMR (Maternal Mortality Rate), Primary, Secondary, Tertiary centre.

#### Introduction

Pakistan failed to achieve millennium development goal 5. We remain unable to reduce our MMR by three fourth between 1990 and 2015. Maternal health is the main indicator of health and socio-economic development. It reflects our health system, government policies, female education, political and economic status of the society. In spite of the efforts being made by the health authorities we are still far away from this target. Every phase of pregnancy (antenatal, intra-partum and postpartum period) is a high-risk time for both mother and newborn. WHO

very keen on measures to reduce maternal mortality, globally. A target was set by WHO for all the developed and under developed countries. By 2015, most of the developed countries have successfully achieved their target of reducing maternal rate by 75%,<sup>2,3</sup>. The exception is the United States, which is one of the few countries in the world that has gone against the trend. Its maternal mortality has risen despite improvements in health care and an overwhelming global trend in the other direction<sup>4</sup>. Maternal mortality is about half a million every year globally. 99% of these women are from the under developed countries but the real scary thing is that

over 90% of these mortalities are from Asia and Africa. According to United Nations reports, maternal mortality has been reduced by 50% in Sub-Saharan African countries<sup>5,6</sup>. In South Asian countries like Pakistan, MMR has reduced by only 4% between 1990 and 2015 according to UNICEF, which is not acceptable. The aim of our study is to calculate the MMR in different hospitals and to compare it at different health levels.

### Methods

The present study is a cross-sectional study conducted by collecting the data of maternal deaths from different hospitals of Pakistan. 60 hospitals were selected randomly in our study. Out of these 60, 20 were tertiary, 20 secondary and 20 primary hospitals respectively.

### Result

Table 1 summarises the data regarding the trends in MMR at different health care levels. Our study showed a very interesting comparison between these three health levels in the year 2016. According to the available data, the total number of maternal deaths in tertiary, secondary and primary centers were 766, 289 and 8 respectively. Total live births in these centers were 169,676 in tertiary, 72,505 in secondary and 5911 in primary centers, resulting in MMR of 452 in tertiary, 394 in secondary and 135 in primary centers respectively. This data shows an alarming rise in MMR of the tertiary centers as compared to the secondary and primary centers. Table 2 shows the percentage of direct and indirect causes of these maternal deaths. According to data, total maternal deaths were 1061. Out of these, 928 (87.46%) were due to direct causes and 133 (12.5%) were due to indirect causes.

**Table 1:** Trends in MMR different Health Care Levels in 2016 (N=60)

	<b>Tertiary Centre n=20</b>	<b>Secondary Centre n=20</b>	<b>Primary Centre n=20</b>
<b>Maternal deaths</b>	767	286	8
<b>Total live births</b>	169,676	72,505	5911
<b>MMR</b>	452	394	135

**Table 1:** Percentage of Maternal Deaths Regarding Direct and Indirect Causes

<b>Total maternal deaths</b>	<b>Direct Causes</b>		<b>Indirect Causes</b>	
	<b>No</b>	<b>%</b>	<b>No</b>	<b>%</b>
1061	928	87.46	133	12.5

### Discussion

Annually, almost 300,000 maternal deaths occur globally.<sup>6</sup> Maternal mortality reflects the reproductive health system of any country. Increased MMR is an indicator of low quality of health services, delayed referral and poor socio-economic status of society. In our study, we found an astonishing increase in MMR in the tertiary centers in spite of skilled staff and well-equipped emergency services. Actually, this increase is due to an increased number of referrals from remote areas. In Pakistan, 45% of deliveries are being conducted by unskilled personnel at homes or in the centers without any healthcare facilities<sup>6,7</sup>. In most of these cases, complications remained undiagnosed and were mishandled and then referred to healthcare centers. These complicated cases were also not entertained at primary and secondary levels due to non-availability of well-equipped obstetrics services. Lack of proper education and guidance to the patients in labour, and her attendants regarding how to respond during the onset of labour and in case of any complication, leads to increased morbidity and mortality of women (WHO 2007). They finally referred these cases to tertiary centers and all these delays contribute to an increasing rate of MMR in tertiary centers. These results are comparable by studies conducted in India and internationally<sup>8,9</sup>. Risk of dying during childbirth is highest during intrapartum period due to reasons described above<sup>9</sup>. In our study, we have realized that the delay in the referral is also due to non-availability of fully equipped ambulance services. Due to this delay, morbidity and mortality of patients increase. This is comparable to another study conducted at JPMC<sup>10</sup>. 60% of women in Pakistan are anaemic and they enter into pregnancy with this anaemia<sup>11</sup>. Prevalence of anaemia in a local study was 75%<sup>12,13</sup>. Due to low socio-economic status and illiteracy, they remain unbooked throughout their pregnancies. Most of these patients required blood transfusion during delivery.

and are not entertained at primary centers, due to non-availability of blood transfusion facilities. These anemic women do not have any reserves and they collapse whenever they suffer from ante partum or post-partum haemorrhage. Hence anaemia in pregnancy became one of the major reasons of increased MMR at secondary and tertiary centers as compared to primary centers. Similar results are shown in other studies conducted locally as well as internationally<sup>7,10,11,12,13,14,15</sup>. Grand-multiparity is also very common in developing countries like Pakistan and is associated with serious morbidity and mortality risk to both the foetus and mother<sup>16</sup>.

Total maternal deaths mentioned in our results were 1061. Out of these, 928(87.46%) were due to direct causes and 133(12.5%) were due to indirect causes. Most of the studies also showed the same results<sup>7,8,9,10,14</sup>. Out of the direct causes, haemorrhage was found to be the major cause followed by eclampsia and sepsis. All of these major causes are preventable. Prompt identification and referral to emergency obstetrical care (EMOC) services can save these women.<sup>17</sup>

As primary centers entertain only low-risk pregnancies, so MMR in primary centers is low. MMR is high in tertiary centers of Pakistan because they deal with all the high-risk cases.

Overall MMR in Pakistan is 178 according to WHO<sup>18</sup>. This is contrary to our results in tertiary and secondary centers as they show increased MMR, whereas in primary centers and in private setups MMR is negligible. According to latest targets and strategies set by WHO in 2014 to reduce MMR to 70/100,000 by 2030. By 2030 no country should have MMR more than 140<sup>19</sup>.

The aim of this study is to emphasize the importance of standard medical facilities round the clock at all primary and secondary health centers. The government should realise the deficiency of tertiary centers in Pakistan. According to the latest census conducted in 2017, the population of Pakistan is almost 220 million. This is really a frightening picture for all the health authorities. Plenty of work is required to plan the strategies and policies to establish new tertiary centers in different cities of Pakistan as well as up-gradation of secondary and primary centers<sup>15,18</sup>.

## Conclusion

Our results are eye opening facts for the Government. We should do enthusiastic and aggressive attempts at all health care levels to reduce the need for referral to tertiary centers and to minimize the MMR.

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