

# ASSESSMENT OF INFANT MORTALITY IN THE RURAL AREAS

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## ABSTRACT

**Objective:** To assess the infant mortality rate, its causes in the rural areas of Peshawar.

**Material and methods:** It was a community based cross sectional study in which 323 women of reproductive age (15-45 years) who had children were interviewed using semi structured and open ended questionnaire and conducted face to face interviews through convenient sampling from January 2017 to April 2017 in the peri-urban areas of Peshawar.

**Results:** The infant mortality calculated for the collected sample was 98 out of 1000 live births which is much higher than the infant mortality of Pakistan. Our research showed that 54% of the total deaths were due to sudden death, gastroenteritis and pneumonia. 63 out of 127 infant deaths occurred among infants of mothers aged 15 to 20 years.

**Conclusion:** Infant mortality, being a crucial indicator of health status of population, was found to be high in rural areas of Peshawar.

**Key words:** Infant, mortality, vaccination, breast feeding, maternal age.

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## INTRODUCTION

Infant mortality refers to deaths of young children, typically those less than one year of age. It is measured by the infant mortality rate, which is the number of deaths of children under one year of age per thousand live births. Infant mortality is an important health indicator because of its association with a variety of factors such as maternal health, quality of medical care, socioeconomic conditions and public health practice<sup>1</sup>. Two thirds of world neonatal deaths occur in just 10 countries, mostly in Asia, among which Pakistan ranks number three. With an estimated 298000 neonatal deaths annually and a reported neonatal mortality rate of 59 per 1000 live births, Pakistan account for 7% of global neonatal deaths<sup>2</sup>. Annual infant deaths have declined from 8.9 million in 1990 to 4.5 million in 2015. The different determinants of infant mortality includes infectious diseases, sudden infant death syndrome, socioeconomic conditions, maternal age and education, low birth weight, vaccination status, preterm births, breast feeding, birth spacing, labor complications, malnutrition, antenatal care unit visits, birth defects,

environmental conditions, asphyxia, birth trauma and metabolic diseases<sup>3,4</sup>. It has been reported that most of the infant die from preventable causes including infectious diseases like respiratory infections, gastroenteritis, fever, eye and ear infections, measles, tetanus and malaria<sup>5</sup>. Young maternal age may be linked to adverse pregnancy outcomes including low birth weight, preterm birth, intrauterine growth restrictions and still birth<sup>6</sup>. Low birth weight (less than 2.5Kg) may arise for two different reasons, one related to gestational age and other corresponding to births that are small for gestational age<sup>7</sup>. Short birth spacing (18-24 months) also leads to increased risk of infant mortality compared to births with longer preceding birth intervals<sup>8</sup>. Preterm birth is recognized as major public health problem by both clinician and researchers because it is the leading cause of infant mortality and caring of preterm infants also incurs large health care expenditures<sup>9</sup>. Laryngotracheobronchial anomalies may cause different degrees of respiratory problems which are usually more severe when patients are younger like infants as they have narrower sizes of airways<sup>10</sup>. Previously done study provides evidence that congenital anomalies are associated with increased perinatal mortality<sup>11</sup>. The potential of exclusive breast feeding during the first four months of life and partial breast feeding throughout the remainder of infancy reduces infant mortality as investigated that it prevents diarrheal diseases and acute respiratory infections<sup>12</sup>. Newborn screening can detect certain hidden conditions that lead to infant deaths<sup>13</sup>. Antenatal care plays a very crucial role in pregnancy outcomes.

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## Assessment of infant mortality in the rural areas.

A good antenatal care helps improving the pregnancy outcomes and reduces the chances of infant mortality hence depicts a country's political, social and economic stability. According to a survey carried out in 2004, it has been noted that there exists a wide difference between the outcomes of pregnancy of women belonging to poor class, rarely visiting health care centers and in those having good antenatal care<sup>14</sup>. The rationale of this study was to collect information about the infant mortality in rural community of Peshawar, to give a preliminary idea to health providers, planners and program executives for the initiation of health care projects in particular areas for infant care.

### MATERIAL AND METHODS

It was a Community based descriptive cross-sectional study conducted in peri-urban areas of Peshawar from January 2017 to April 2017. Using WHO sample size calculator, 323 women of reproductive age 15-45 years were included. Informed verbal consent was taken and those who were willing were included in our study. Guests from other cities and those unwilling to participate were excluded from our study. These women were selected through convenient sampling technique. Structured questionnaire was used for collection of data which was analyzed using SPSS version 20. Limitations of our study were that most of our respondents were uneducated and they had no knowledge about their age, age of marriage, age of children and exact age of death of infants. Some respondents did not want to be part of the study.

### RESULTS

The 323 mothers gave 1295 live births. Ninety six mothers were positive for infant mortality with 233 mothers negative for infant mortality. Out of 1295, 127 infants died leaving 1168 viable infants. IMR calculated was 98/1000 live births. Gender wise, 57(45%) were males and 70(55%) were females. Various causes of infant deaths were found as shown in Table 1. Probable age of the mothers with highest infant mortality was 15 to 20 years as shown in Figure 1. Sixty thousand (50%) out of 127 infants death occurred to this age group mothers.

Seventy three (61%) infant died during first month after birth. Inter pregnancy interval (birth spacing) of 1 year between the dead infants and the infants born before him/her was found in 41(32%) out of the 127 infant deaths. Forty five (35%) out of 127 infants were born prematurely. Seventy five (59%) out of 127 infants were under treatment for the respective disease. While 52(41%) infants either died spontaneously or without seeking medical attention. Out of 127 dead infants, 61(48%) were delivered by their mothers at hospital

while 66 infants (52%) were delivered at the home. Breast feeding and vaccination status of the dead and alive infants are shown in Table 2. Comparison of diseases between positive and negative cases of infant mortality among mothers during pregnancy are shown in Figure 2.

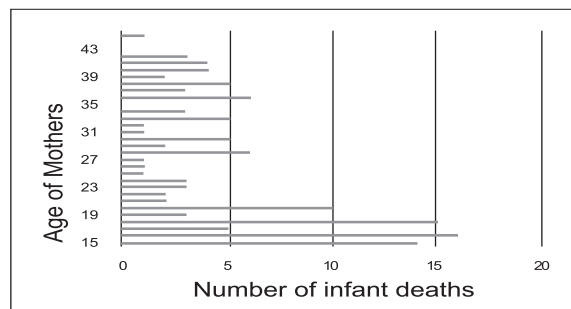


Fig 1: Age distribution of mothers with infant death

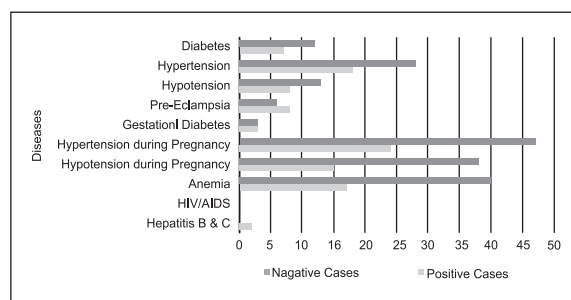


Fig 2: Diseases during pregnancy as possible risk factor for infant mortality.

Table 1: Probable Cause of the death of the infants

<b>Sudden Death</b>	<b>37 (27.13)</b>
Gastroenteritis	15 (11.81%)
Cyanosis	12 (9.44%)
Febrile Fits	12 (9.44%)
Pneumonia	16 (12.59%)
Measles	08 (6.29%)
Jaundice	12 (9.44%)
Congenital complications	05 (3.93%)
Accidents	07 (5.51%)
Hydrocephalus (Congenital)	03 (2.36%)

Table 2: Breast feeding to vaccination status.

Variables	IMR+	IMR-	
Breast fed	95	1073	ODD's Ratio 0.26
Not breast fed	32	95	
Vaccinated	66	935	ODD's Ratio 0.27
Not vaccinated	61	233	

## DISCUSSION

In 2015, globally 4.5 million infant deaths occurred within the first year of life. The mortality rate in United Kingdom in 2015 was 2 out of 1000 live births, in USA 3.6 out of 1000 live births, in China 5.5 out of 1000 live births, in Australia 2.2 out of 1000 live births and in Pakistan 45.5 out of 1000 live births<sup>15</sup>. The above statistics makes it obvious that infant mortality in Pakistan is far greater than the developed countries across the globe. Our team visited 6 villages (Nasir Bagh, Potwar, Regi, Palosai, Peshtakhara and Kochiyan) located in the peri-urban settings of Peshawar. The infant mortality calculated for the collected sample was 98 out of 1000 live births. Gender wise, 57(45%) were males and 70(55%) were females. The previous trend was of increased mortality of males than females. Thus, further studies should be conducted to find out the current gender wise infant mortality trend in Peshawar. Fifty five percent of the total deaths were due to sudden death, gastroenteritis and pneumonia. Previous studies shows a strong evidence that most of the deaths were due to respiratory infections, gastrointestinal infections and measles etc<sup>5,16</sup>. Our results in this regard matched with the previously done study in Peshawar. This shows that these diseases are still the most common causes of infant mortality in Peshawar. These are few preventable causes and awareness about its prevention is needed in the general population to reduce infant mortality in the coming decade. Similar study was also done in the rural areas of north India which showed infections (pneumonia, diarrhea and sepsis) caused 58.7% of post neonatal deaths<sup>17</sup>. Thus showing, the two countries fight against the common enemy in this regard. The most common diseases during pregnancy as a possible risk factor for infant mortality were anemia, hypertension and hypotension which constitute more than 70% of the total diseases evident in 323 mothers. The probable age of the mothers with highest infant mortality was 15 to 20 years. Sixty three(50%) out of 127 infants death occurred to this age group mothers. The results of our study are supported by the results of study done in Tanzania showing infant mortality of 46 out 1000 live births to teenage mothers<sup>13,19</sup>. The reasons for this are physiological immaturity of young mother and lack of social experience<sup>18</sup>. One of the most important findings was birth spacing; of the total deaths, 41(32%) had birth spacing of less than a year. Previous studies also shows that, short birth spacing (18-24months) also leads to increased risk of infant mortality compared to births with longer preceding birth intervals thirty five percent (35%) out 127 infants were born prematurely. The previously done study in US in 2002 showed that preterm birth is the most frequent

cause of death, accounting for at least one third of infant death in 2002<sup>19</sup>. Comparing results of breast feeding, it was found that 25.19% of dead infants were not breast fed in contrast with only 8.1% viable infants who were not breast fed. Thus, clearly showing the importance of breast feeding in developing the innate immunity of the new born. Out of 127 dead infants, 48% were delivered by their mothers at hospital while 52% were delivered at the home. On the contrary 23.2% of viable infants were delivered at home, with 76.8% delivered at the hospital. Thus a strong evidence showing that deliveries at home carried a greater risk of infant mortality than at hospitals. The vaccination status showed that 52% of the infants who died were vaccinated while 48% were not vaccinated. A study conducted in Khyber teaching hospital in 2011 to 2014 showed that out of 432 children under five years of age that were included in the study, 61% children from urban areas were fully vaccinated, while only 45 % of the children from rural areas were fully vaccinated. These studies show the great disparity in the immunization status of urban and rural child population<sup>20</sup>. Our results in this regard matched with the previously done study. As the Expanded Program of Immunization is effective in our country and targets about 4.8 million children below one year of age to protect them against 8 vaccine-preventable diseases<sup>21</sup>, hopefully, in the coming years almost all infants will be vaccinated against children preventable diseases.

## CONCLUSION

Infant mortality, being a crucial indicator of health status of population, was found to be high in rural areas of Peshawar, which reflects failure of our health care system, particularly the primary health care.

## Recommendations

General public and specially women should be made aware about prevalence and risk factors of infant mortality. More resources should be provided and utilized for newborn screening procedures which can detect certain underlying conditions in an otherwise normal looking infant. Antenatal care, hospital delivery, vaccination, breast feeding and family planning should be encouraged through awareness campaigns which must be launched at community level by public and private organizations.

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### **AUTHOR'S CONTRIBUTION**

Following authors have made substantial contributions to the manuscript as under:

- Ijaz N:** Planned the study involved in discussion writing final review.  
**Safi MF:** Literature research and designed the questionnaire.  
**Agha SK:** Literature research wrote the abstract  
**Gul A:** Data collectoin Statistical analysis  
**Nasir F:** Data collection , wrote the result section proof reading  
**Siddiqui NH:** Data collection ,involved in introduction writing

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.