**ORIGINAL ARTICLE**

# A SOCIO- DEMOGRAPHIC PROFILE OF INFANT DEATHS IN A TRIBAL BLOCK OF SOUTH GUJARAT

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**ABSTRACT**

With progressive reduction in infant mortality rate (IMR) and advent of technology, socio – demographic determinants assume more importance (than biological), more so in remote and inaccessible areas, which incidentally also record high IMR. Study was carried out in a tribal block of South Gujarat to generate socio- demographic profile for 48 infant deaths reported during one year. Data was collected through house to house survey on a designed questionnaire. Amongst 48 death cases, literacy rates amongst mothers and fathers were 64.6 and 75% respectively. Occupation wise 81.3% fathers and 52.1% mothers were farm laborer. Joint families were in 81.3% cases and 85.4% belonged to lower social class. Teenage pregnancy was found in 56.3% cases. Age of 25% mothers' at birth was below 20 years. First birth order was found in 47.9% cases. Birth spacing was less than 2 years in 60.4% cases. It is concluded that improving literacy, increasing age at pregnancy, increasing birth spacing (> 2 years) along with overall socioeconomic improvement of community can help in attaining the further reduction in infant mortality.

**Key-words:** Infant deaths, socio-epidemiological profile, socioeconomic status, literacy, teenage pregnancy

## INTRODUCTION

Infant mortality is not only an indicator of infant health, but also of the entire population and of their poverty ridden social status. [1] Infant mortality rate (IMR) (infant deaths per 1000 live births) has declined in last decades in India (50) and in Gujarat (48) [2] though it is still high compared to developed countries [3]. With decrease in IMR, it becomes important to find out various types of determinants and their interplay leading to the infant deaths. Research studies in India so far have explored the causes and determinants of infant mortality focusing mainly on biological ones and the use of health services. [1] In industrial world, dominant factor of decline in infant mortality has been the social and economic progress with medical services playing the secondary role. [4] Therefore in a scenario where the IMR is on decline, the social, economic or demographic determinants assume important role than the biological ones. Elaboration of the social profile of the infant deaths explains how social factors are the main determinants of IMR. To our best of knowledge no such community-based study has been undertaken in Gujarat, with emphasis on socio-demographic aspects. Study was undertaken with objective of generating socio-demographic profile for all infant deaths.

## MATERIALS AND METHODS

Study was carried out in all 51 villages of 3 selected Primary Health Centers (PHCs) of a remotely located, tribal dominated block from a border district of South Gujarat. Purposive sampling was done to select study populations keeping in mind the resources, feasibility, logistics and the availability of time. It was thought that population of 3 PHCs would be sufficient to meet the required sample size to fulfill the objective of the study. The study incorporated all the infant deaths, which occurred during selected one year period (from 1st September 2004 to 31st August 2005). Field based data collection was accomplished within three months period. The infant deaths in which the mother was daughter-in-law of the village only, were included in the study. The information regarding infant deaths was gathered through 4 sources namely health care system, Integrated Child development services (ICDS) scheme, Civil Registration System (CRS) and Investigator himself. The disparity in reporting infant death by various agencies during the same period and in the same study area is reported elsewhere.[5] Data collection was done through house to house visits in study area. For every infant death noticed, interview was conducted at informant's house in the local language. First of all the purpose for study was explained to the informant and his/ her consent was obtained. Information about literacy and occupation of parents, basic family characteristics and maternal and birth related characteristics were gathered by interviewing the available parent (preferably mother), on a designed verbal autopsy (VA) questionnaire - developed with the help of VA questionnaire of various agencies like WHO, SEARCH team, Centre for Global Research and Aga Khan foundation. Data was entered and analyzed with Epi Info 6.04 version software.

## RESULTS

A total of 48 infant deaths from the study area during one year period were found. In all cases, both parents were married and alive; living together and in no case father was staying away for job related or any other reason. Literacy rates amongst mothers and fathers were 64.6 and 75 percent respectively. Very few (4 - 8%) had high education (graduation & above). When literacy was considered together, in 54.2% cases, both parents were literate; while one of the parents was literate in 31.2% cases and in rest (14.6%), both parents were illiterate. Most common occupation was farm labor for father (81.3%) and mother (52.1%) (Table 1).

**Table 1:** Distribution of infant deaths according to education and occupation of parents (N = 48)

| Characteristics | Infant Deaths | |
|---|---|---|
| | Mother(%) | Father(%) |
| **Education** | | |
| Illiterate | 17 (35.4) | 12 (25.0) |
| Up to primary | 14 (29.2) | 15 (31.3) |
| Up to higher secondary | 15 (31.3) | 17 (33.4) |
| Graduate & above | 2 (4.1) | 4 (8.3) |
| **Occupation** | | |
| Farm laborer | 39 (81.3) | 25 (52) |
| Factory worker | 3 (6.2) | - |
| Shopkeeper | 3 (6.2) | - |
| Others* | 2 (4.2) | - |
| Unemployed/ Housewife | 1 (2.1) | 23 (48) |

*include milk seller and helper in a newspaper office

As per various family based characteristics, in 81.3% of infant deaths, families were of joint type; rests (18.7%) were nuclear. Average family size was 5.63 ± 2.4, while 60.4% had family size of 1-5. Others (39.6%) had a family size of 6 or more including 10.4% with 10 or more family members.

**Table 2:** Distribution of infant deaths according to family based characteristics

| Characteristics | Infant Deaths (N = 48) | |
|---|---|---|
| | No. | % |
| Family type | | |
| Nuclear | 9 | 18.7 |
| Joint | 39 | 81.3 |
| Family size | | |
| 1-5 | 29 | 60.4 |
| 6-9 | 14 | 29.2 |
| 10 & above | 5 | 10.4 |
| Social class | | |
| I & II* | 4 | 8.3 |
| III | 3 | 6.3 |
| IV | 17 | 35.4 |
| V | 24 | 50.0 |

*No family belonged to social class I

Socio economical class of the families was decided on the basis of per capita income

according to modified Prasad's classification [6]. No family belonged to social class I. Most (85.4%) of them were from lower social class i.e. class IV and V, while rest (14.6%) belonged to class II and III (Table 2).

Mean age at marriage was 17.8 ± 3.03 years with range, median and mode being 7 – 26, 18 and 16 years respectively. Considering the legal age at marriage (18 years for female) 62.5 percent mothers got married before attaining the legal age of marriage. In more than half (56.3%) infant deaths mother's age at first pregnancy was below 20 years. The mean age of mothers at first pregnancy was 19.7 ± 2.7 years, with median and mode as 19 and 17 years respectively. Mean age for mothers at birth was 21.9 ± 3.5 years while median and mode were 21 and 19 years respectively.

**Table 3:** Distribution of infant deaths according to maternal and birth related characteristics

| Characteristic | Infant Deaths (N=48) | |
|---|---|---|
| | No. | % |
| Mother's Age in years at Marriage | | |
| <15 | 2 | 4.2 |
| 15-18 | 28 | 58.3 |
| 19-21 | 13 | 27.1 |
| > 22 | 5 | 10.4 |
| Mother's age (years) at first pregnancy | | |
| 15-19 | 27 | 56.3 |
| 20-24 | 19 | 39.5 |
| 25-29 | 2 | 4.2 |
| Mother's age (years) at birth | | |
| 15-19 | 12 | 25.0 |
| 20-24 | 29 | 60.4 |
| 25-29 | 4 | 8.3 |
| >=30 | 3 | 6.3 |
| Birth Order | | |
| 1 | 23 | 47.9 |
| 2 | 20 | 41.7 |
| 3 | 4 | 8.3 |
| 6 | 1 | 2.1 |
| Birth Spacing (years) | | |
| < 2 | 29 | 60.4 |
| 2 - < 4 | 9 | 18.7 |
| 4 - < 6 | 7 | 14.6 |
| ≥ 6 | 3 | 6.2 |

In one fourth (25%) of infant deaths, mother's age at birth was below 20 years and in 6.3% cases it was 30 years or more. Regarding birth order, first birth order was found in 47.9% infants. While 41.7% cases had second order; and in 10.4 % infants it was third or more. Birth spacing ranged between 1- 9 years with median and mode both being 2 years. It was less than 2 years in 60.4 percent infant deaths (Table 3), it was worse for second birth order where spacing was less than 2 years in 72% cases.

## DISCUSSION

Present study aims to find out some known socio - demographic determinants of infant deaths in an area which is remote in location and is inhabited largely by tribal population.

Children of illiterate mothers had higher risk of dying during infancy compared to literate mothers, as a strong link is seen between female education and child survival.[7-9] Literacy levels of parents in our study are comparable with literacy rates reported in Gujarat; though the male literacy in the study was less (75%) than figures of Gujarat (83%).[7] Not much importance can be attached to the literacy alone as what is more relevant for preventing infant deaths is the level of schooling. Educated women are likely to marry at higher age, less influenced by traditional practices inimical to health care, more capable of dealing with modern institutions and are able to alter the traditional balance to favor children. A study from abroad[10] reported that maternal and paternal education were independent predictors of mortality beyond the neonatal period.

All fathers were employed and dominant occupation was farm labor. In case of mothers too, more than half were employed all being farm laborers. A study[11] reported employed mothers only in 13.3% early neonatal deaths and a study from Lucknow[12] found more such deaths among families having agricultural work as father's occupation compared to other occupations. Studies[1, 9] reported that the impact of the percentage of male laborers in non agricultural work on IMR is negative and both parents as skilled workers can help child survival. Employment status of mother has two way effects on mortality. Need to work outside the house prevent the mother from caring for the infant because of dual burden and thereby increase the risk of infant death. On the other hand, it leads to higher family income and gives the mother a modern outlook, both of which increase the probability of child survival.

Studies[13-14] had reported that babies born in joint and large sized families had greater risks of neonatal and overall infant mortality. Families

in our study were mainly joint (81.3%), almost two times more than rural Gujarat[7] (43.4%). Studies have reported that babies born in families with low socioeconomic status[1, 7-8, 15] had a higher risks of infant death as the capacity (of families) for child care is minimal and child survival depends on the ability to offer good care. Majority (85.4%) of families in the study belonged to lower social class (Class IV & V) while none belonged to social class I.

The median age at marriage of mother was 18, similar to Gujarat[7]. More than half of the mothers got married before attaining the legal age at marriage, higher compared to Gujarat (39%) [7]. High risk of infant deaths among teenage pregnancy is due to biological and psycho-social immaturity of mothers as well as more chances of low birth weight babies. Infants born to mothers above age 30 are also at risk of congenital problems. Therefore, a U-shaped pattern of mortality by mother's age was seen with higher infant mortality among mothers below 20 years of age and above 30 years, is seen everywhere [9, 16-18] including Gujarat[7]. Similar was observed in relation of age of mother at first pregnancy.

First birth order carries high risk of infant death due to early age at marriage, teenage pregnancy/ motherhood and associated reasons as discussed above. In Gujarat [7], the same U-shaped relationship of infant mortality and birth order was found with first and high order births with high mortality as was with mother's age. Regarding birth orders in our study, first, second and third or higher birth order was found in 47.9%, 41.7% and 10.4 % infant deaths respectively. Studies [8, 13-14] substantiate a strong association between short birth intervals and increased infant mortality. Birth spacing in our study was less than 2 years in 60.4% infant deaths. In second birth order, 72% had interval to previous birth was less than two years. It explains the relatively large proportion of deaths in second birth order infants, which is otherwise not a risk factor for infant death. In Gujarat [7] too, the risk of death was higher for infants born within birth intervals of less than two years compared with those born beyond spacing of two or more years.

## CONCLUSION

Study has no control group so we cannot attribute or quantify the role of various attributes on infant mortality. Yet, by comparing this profile with rural Gujarat, We can summarize that improvement in education especially amongst females, engagement of people in skilled jobs along with overall socioeconomic improvement of community are essential in making further dent in existing infant mortality. Efforts toward increasing the woman's age at marriage and spacing pregnancies at least two years apart are needed.

## Acknowledgement

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