# DEMOGRAPHIC CHARACTERISTICS, CONTRACEPTION AND INFANT MORTALITY: A COMPARATIVE STUDY OF RURAL AND URBAN AREAS OF GUJRAT

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## ABSTRACT

*One of the Millennium Development Goals is the reduction of infant and child mortality by two-thirds by 2015. In order to achieve this goal, efforts are concentrated at identifying cost-effective strategies as many international agencies have advocated for more resources to be directed to health sector. The demographic study of the determinants of infant and child mortality will concentrate on the certain factors, which may influence the likelihood of ill health, disease and death in early infancy. The main objective of the study is to compare the factors of infant mortality among rural and urban areas and to measure the impact of residential area on infant mortality also find out the impact of contraception on infant mortality and to know the differentials of infant mortality among rural and urban areas. The study was conducted in Gujrat. Sampling frame of such women was hard to find who have experienced infant mortality so non probability sampling was used in this study and from non probability sampling, purposive and snow ball sampling technique were used to locate the respondents. Sample size of 75 women was taken for this study because such women having experience of infant mortality are not much frequent so low sample size was relied. A well-structured interview schedule was used to collect the data. The study concluded that Access to family planning and reproductive health services along with the use of contraception has significant effect on infant mortality. Because both these are found very low among the women experienced infant mortality.*

**Keywords:** Demographic, Characteristics, Contraception, Infant, Mortality

## INTRODUCTION

One of the Millennium Development Goals is the reduction of infant and child mortality by two-thirds by 2015. In order to achieve this goal, efforts are concentrated at identifying cost-effective strategies as many international agencies have advocated for more resources to be directed to health sector.

The infant mortality rate (IMR) is defined as the risk for a live born child to die before its first birthday is known to be one of the most sensitive and commonly used indicators of the social and economic development of a population (Stroobant, M & Gourbin, 1995).

### Effect of Demographic Characteristics on Infant mortality

Even though death is a biological event, mainly caused by a specific disease, the demographic study of the determinants of infant and child mortality will concentrate on the certain factors, which may influence the likelihood of ill health, disease and death in early infancy. Besides socioeconomic characteristics, demographic characteristics of the child and the mother have been found to affect mortality risks. Some of these factors are the sex of the child, mother's age at birth, birth order, length of previous birth interval, and the mother's perception of the size of the child at birth.

**Effect of Contraception on Infant mortality**

Family planning is an important part of efforts to improve infant and child survival. Delaying and spacing births helps women bear children during their healthiest years and enables them to have their desired number of children. International health experts now believe that the healthiest interval between a woman's previous birth and her new pregnancy is at least two years. By preventing closely spaced births, family planning could save the lives of more than 2 million infants and children annually. After giving birth, family planning can help women wait at least two years before trying to become pregnant again, thereby reducing newborn, infant, and child deaths significantly (WHO, 2007) In a paper showed that adoption of contraception in societies with low prevalence may not have beneficial effects on infant mortality. Infant mortality started its decline in Europe and the USA by 1900, several decades after a decline in early childhood and general mortality had begun. Nutritional improvements (Bongaarts, 1987)

Historical studies on infant mortality brought about the quite general observation that a good deal of its decline could be achieved before efficient preventive and curative medication (vaccination against measles, whooping cough, tetanus... and antibiotics) was made available: « the historical evidence is consistent with the view that medical interventions could only have affected mortality in general and infant mortality in particular after 1930 (Palloni, 1990)

**Objectives of the Study**

1. To find out the impact of contraception on infant mortality
2. To know the differentials of infant mortality among rural and urban areas
3. To measure the level of infant mortality against various demographic and social variables

**REVIEW LITERATURE**

For a review of the history and literature of studies into birth spacing, please refer to Since that paper there have been a few new studies: Conde-Agudelo et al. (2007), on the basis of a meta-analysis of 22 studies, found evidence that long inter-pregnancy intervals (over five years) were associated with increased risk of preeclampsia and labor dystopia. Short intervals were associated with increased risk of uterine rupture and uterus-placental bleeding disorder, and both long and short intervals were associated with other adverse maternal outcomes of pregnancy. However, the authors concluded that more research is needed. In an earlier systematic literature review and meta-analysis these authors concluded that inter-pregnancy intervals shorter than 18 months and longer than 59 months are significantly associated with increased risk of adverse perinatal outcomes, such as pre-term birth, low birth weight, and small for gestational age. They suggest that spacing pregnancies appropriately could help prevent such adverse perinatal outcomes.

Zhu B. et al. (2006) studied the relationship between labor dystocia and inter-pregnancy interval using linked birth certificate-hospital discharge data for Michigan infants born between 1994 and 2002. The authors found that labor dystocia is common. In singleton births to multiparous mothers, labor dystocia increased with inter-pregnancy interval in a dose-response fashion, when controlled for confounding factors. Lowest levels of dystocia occurred in pregnancies occurring less than two years after a preceding pregnancy and the adjusted odd ratio for dystocia rose to 1.50 for intervals of 10 or more years. Additionally, the authors state that functional dystocia was associated more strongly with inter-pregnancy interval than mechanical dystocia.

## MATERIALS AND METHODS

This study was the cross sectional and retrospective. Target population was the women who have experienced infant mortality at least once. The study was conducted in Gujrat. Among the Tehsil Gujrat, 8 family welfare center areas were selected by simple random method including 6 rural and 2 urban FWCs. Then 5 respondents were taken from each FWC's area.

Sampling frame of such women was hard to find who have experienced infant mortality so non probability sampling was used in this study and from non probability sampling, purposive and snow ball sampling technique were used to locate the respondents. Sample size of 75 women was taken for this study because such women having experience of infant mortality are not much frequent so low sample size was relied. A well-structured interview schedule was used to collect the data. Collected data was entered in computer by using statistical packages for social sciences (SPSS) for coding of data. And codes were given according to numbers written in questionnaire and after that data was ready for further analysis. Data analysis was presented by frequency tables of all included variables.

## DATA ANALYSIS

### Descriptive Statistics

**Table 1. Descriptive Statistics of Variables**

| Variables | Rural Area | | | Urban Area | | |
|---|---|---|---|---|---|---|
| | Mean | Std. Deviation | Missing | Mean | Std. Deviation | Missing |
| Age of respondent(in years) | 36.00 | 12.818 | 0 | 38.68 | 9.182 | 0 |
| Age of Husband (in years) | 40.35 | 12.684 | 0 | 43.44 | 11.983 | 0 |
| average household monthly income (in PKR) | 18163.6 | 13568.43 | 10 | 23611.1 | 14585 | 7 |
| Number of family members | 7.60 | 3.481 | 0 | 6.40 | 2.915 | 0 |
| Age at marriage | 18.55 | 3.679 | 0 | 19.84 | 3.249 | 0 |
| Age at first birth | 20.82 | 3.601 | 0 | 21.80 | 3.014 | 0 |
| Number of infant mortalities | 1.89 | 0.937 | 0 | 1.64 | 0.700 | 0 |
| Duration between last two births (in months) | 15.52 | 7.471 | 0 | 18.88 | 9.444 | 0 |

### Interpretation

Average age of respondents in rural areas is found to be 36 years with standard deviation of 12.18 years while in urban areas it is about 39 years with std. deviation of 9.2 years.

Average age of husbands of respondent women is 40 in rural and 43.5 in urban areas with standard deviation of 12 years is found in this study.

Average household monthly income of rural areas is about 5000 less than those of urban areas. This is because in urban areas there are more opportunities to earn money so the monthly income is also higher than rural counterparts.

Number of family members on average in rural areas are 7.6 per family and in urban areas this figure is about 6.4 per family, it is also found that more of urban families are living separately.

Age at marriage for women is an important indicator of infant mortality which is 18.5 years in rural areas and more than one year greater is found in urban areas.

Age of mother at first birth is 20.8 years in rural areas on average and in urban areas it is 19.8 years which is also greater than in rural areas.

Number of infant mortalities on average in rural areas is 1.89 infants and 1.64 is found for urban areas.

Spacing between children is also an important indicator of infant mortality which is 15.5 months is found for rural areas and about 19 months is found for urban areas.

These all above mentioned indicators show the less likelihood of infant mortalities in urban areas as compared to rural counterparts.

### Inferential Statistics

### Relationship between demographic characteristics and infant mortality

$H_0$: There is no significant relationship between demographic characteristics and infant mortality.

$H_1$: There exists significant relationship between demographic characteristics and infant mortality.

$\alpha = 0.05$

### Table 2. Spearsman Correlation Test

| Dependent Variables | Statistics | Number of Infant Mortalities |
|---|---|---|
| Education Level | Correlation Coefficient | -0.439 |
| | Sig. (2-tailed) | 0.000 |
| | N | 90 |
| Education Level of Husband | Correlation Coefficient | -0.261 |
| | Sig. (2-tailed) | 0.013 |
| | N | 90 |
| Age At Marriage | Correlation Coefficient | -0.266 |
| | Sig. (2-tailed) | 0.011 |
| | N | 90 |
| Age at first birth | Correlation Coefficient | -0.262 |
| | Sig. (2-tailed) | 0.013 |
| | N | 90 |
| Average Monthly Household Income (in PKR) | Correlation Coefficient | -0.309 |
| | Sig. (2-tailed) | 0.008 |
| | N | 73 |

## Interpretation

Education level is found to have negative impact on infant mortality, as infant mortality level decreases with the increase of education attainment level. Value of correlation coefficient (-0.439) shows that relationship of education level of mothers and infant mortality level is negative. Education aware the people and also increase the age at marriage and also age at first birth which in turn decreases the level of infant mortality.

Similarly education attainment level of husband has also negative effect on infant mortality (-0.266). Hence, our study concluded that the education is very important factor of infant mortality regardless of the residential area of respondents.

Value of correlation coefficient (-0.266) for age at marriage proposed that higher age at marriage of women results in lower infant mortality level, it also has negative relation with infant mortality.

Similarly age at first birth is an important factor for infant mortality, results show that higher infant mortality ratio usually found in women having birth in early age. So higher age at first birth is found to have negative (-0.262) affect on infant mortality.

Household income enhances the access to different kinds of resources including family planning and quality care for mother and child so it also negatively (-0.309) impacts the level of infant mortality.

## Infant Mortality and Residential Area

$H_0$: There is no significant association between residential area and infant mortality.

$H_1$: There exists significant association between residential area and infant mortality.

$\alpha = 0.05$

**Table 3. Chi-Square Association Test**

| No of Infant Mortalities | Residential Area | | Total |
| --- | --- | --- | --- |
| | Rural | Urban | |
| 1 | 28 | 12 | 40 |
| | 70.0% | 30.0% | 100.0% |
| 2 | 20 | 10 | 30 |
| | 66.7% | 33.3% | 100.0% |
| 3 | 13 | 3 | 16 |
| | 81.3% | 18.8% | 100.0% |
| 4 | 4 | 0 | 4 |
| | 100.0% | 0.0% | 100.0% |
| Total | 65 | 25 | 90 |
| | 72.2% | 27.8% | 100.0% |
| Chi-Square Value= 2.75 | | p-value=0.432 | |
| Value of Cramer's V=0.175 | | p-value=0.432 | |

## Interpretation

P-value of chi-square (0.432) shows that residential area has significant association with infant mortality. Cross table of infant mortality and residential area shows that more infant mortality cases are found in rural areas. This happens because of certain reasons including lack of awareness and mostly women are not doing any job so they are more likely to conceive children as compared to the women of urban areas and also infant mortality ratio is higher in rural areas.

## Infant Mortality and Use of Contraceptives

$H_0$: There is no significant association between use of contraceptives and infant mortality.

$H_1$: There exists significant association between use of contraceptives and infant mortality.

$\alpha = 0.05$

### Table 4. Chi-Square Association Test Calculations

| No of Infant Mortalities | Do you or your husband use any contraceptive? | | Total |
| --- | --- | --- | --- |
| | Yes | No | |
| 1 | 12 | 28 | 40 |
| | 30.0% | 70.0% | 100.0% |
| 2 | 4 | 26 | 30 |
| | 13.3% | 86.7% | 100.0% |
| 3 | 6 | 10 | 16 |
| | 37.5% | 62.5% | 100.0% |
| 4 | 0 | 4 | 4 |
| | 0.0% | 100.0% | 100.0% |
| Total | 22 | 68 | 90 |
| | 24.4% | 75.6% | 100.0% |
| Chi-Square Value= 0.142 | | p-value=0.142 | |
| Value of Cramer's V=0.246 | | p-value=0.142 | |

## Interpretation

P-value of the above test (0.142) shows that there exists significant association between infant mortality and use of contraceptives. Value of Cramer's V test (0.246) indicates the positive associations between the mentioned indicators i.e. more infant mortality cases are found in women who reported that they don't use any type of contraceptives. This shows that use of contraceptives increase the space between children which in turn helps to prevent the incidence of infant mortality cases.

## Infant Mortality and Types of Preferred Contraceptives

$H_0$: There is no significant association between use of contraceptives and infant mortality.

$H_1$: There exists significant association between use of contraceptives and infant mortality.

α= 0.05

**Table 5. Chi-Square Association Test Calculations**

| No of Infant Mortalities | Type of Preferred Contraceptive | | | | Total |
|---|---|---|---|---|---|
| | No Method | Condom | Tablets | Injection | |
| 1 | 28 | 4 | 4 | 4 | 40 |
| | 70.0% | 10.0% | 10.0% | 10.0% | 100.0% |
| 2 | 26 | 4 | 0 | 0 | 30 |
| | 86.7% | 13.3% | 0.0% | 0.0% | 100.0% |
| 3 | 10 | 0 | 0 | 6 | 16 |
| | 62.5% | 0.0% | 0.0% | 37.5% | 100.0% |
| 4 | 4 | 0 | 0 | 0 | 4 |
| | 100.0% | 0.0% | 0.0% | 0.0% | 100.0% |
| Total | 68 | 8 | 4 | 10 | 90 |
| | 75.6% | 8.9% | 4.4% | 11.1% | 100.0% |
| Chi-Square Value= 22.681 | | | p-value=0.007 | | |
| Value of Cramer's V=0.290 | | | p-value=0.007 | | |

**Interpretation**

Chi square test on preferred types of contraceptives and infant mortalities shows that there is no significant association between these two variables because p-value (0.007) is less than the level of significance (0.05). But it is shown in the last table that infant mortality is significantly associated with infant mortality.

**CONCLUSION**

The impact of demographic characteristics of parents and deceased infant along with the impact of contraception by parents on infant mortality was studied in the research project during the internship period. This study concludes that age at marriage of mothers who have experienced infant mortality is lower than the average age at marriage of the country for the women which can be states that marriage of women at younger age may be a significant factor to increase the infant mortality, along with the education of women, because most women in this study were found illiterate, so lack of education plays also a vital role to increase the infant mortality. As women education is not much prevalent in rural areas, so this incident of infant mortality mostly arouse in rural areas of Gujrat. While died infants do not differ on the basis of their gender as male and female infant mortality is found equal in this study.

Access to family planning and reproductive health services along with the use of contraception has significant effect on infant mortality. Because both these are found very low among the women experienced infant mortality.

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