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A Comparative Analysis of Factors Effecting Infant Mortality in Urban and Rural Regions: A Case Study of Pakistan

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ABSTRACT

This research study examined the effect of economic and demographic factors associated with infant mortality in Pakistan. For this the data from the Pakistan Demographic and Health Survey (PDHS) 2006-07 was utilized consisting of all Urban and rural areas of four provinces in Pakistan. The Binary Logistic Regression Model was employed for estimation. It was found that survival status of child depends directly or indirectly on parental education and health acquiring attitude. Parents with improved social status, protected source of water and access towards health services had better status of their child survival. Research study recommended that higher Literacy rate is useful to develop understanding about reproductive health and to optimize the use of available health resources. We find that Parental education, mother's age at child birth, birth interval, birth order, use of prenatal care and access towards health professional by mother when pregnant have statistically significant effects on the survival status of children.

Introduction

Death is certain: a universally recognized fact. The human society, even having acknowledged this universal truth has been constantly trying to delaying death since the dawn of civilization. Developed nations are to some extent successful in it but the developing or underdeveloped countries seem to be failed in reducing overall mortality and suffer from quite a high infant mortality rate.

One of the central millennium development goals of united nation is to *"Reduce child mortality"*. In this context, infant mortality rate (IMR) is an effective child health indicator, generally defined as the number of deaths of infants (one year of age or younger) per 1000 live births. *"The infant mortality rate is the most sensitive index of the status of economic and social development of any country" (Wallace, 1988).*

Infant mortality is a subject of great interest to social scientists, policy makers and those who are concerned about the quality of life in less developed countries. In 2001, the IMR for Less Developed Countries (91) was about 10 times as large as it was for More Developed Countries (8). Pakistan, with 67 deaths for every 1,000 live births, ranks worst than Sri Lanka (19), Bhutan (52), Nepal (62), Bangladesh (57), and India (32). (CIA World Fact book ,2008).

Education is the basis for creating and spreading knowledge, enabling the use of new technologies and improving health. The outcome of parental education on infant health and mortality is noteworthy in different ways. Educated Parents have a direct impact on child health by developing awareness and perceptive of better health investments for themselves and their children. Parental education also affects child health indirectly. An increased level of education usually returns high earnings, which could be invested in preventive measures for child health. Parental schooling also adds to the opportunity cost of having or delay having kids. Mother's education has a solid indirect effect, being strongly linked with use of health care facilities in pregnancy period. The impacts of women's education on their own dietary status and on that of their children are also exerted through their roles as providers of family health and nutrition care.

Parental education would thereby clearly affect child health, since they may be well-versed about health care services, or have a health behavior that provides benefits to their children.

Different surveys were conducted from time to time, covering households across urban and rural communities to supply information concerning Household Assets/ Amenities, Education, Health, Immunization, Pre/Post Natal care of females and Household satisfaction by facilities and services. The central aim was usually to supply data for use in formulating the poverty decline policy and development plans. The child health and mortality remained a forgotten issue in all these and no one exploited the data to comprehensively analyze the factors influencing deaths of child. The important aim of the present study is to bridge that research gap and to determine the impact of socio-economic and demographic factors on infant mortality at urban and rural regions of Pakistan.

Review of Literature

Maternal factors, which were natural attribute of birth, such as the age of mother at the time of childbirth, birth position and birth space [Forste (1994); Rutstein (1984)], had significant effects on child endurance. Newborn and child mortality were also affected by the sex of the child, and infants born to mothers who had lost a child were at greater risk of dying during infancy [Cleland and Ginneken (1988)].

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Galway et al, (1987); Hobb-craft et al.(1984) found that children born to vary young and older mothers, especially after 35, having repeated births with short intervals were having more threat of death.

The reaction of parental education on infant and child physical condition and death has proved to be universally noteworthy [Bicego and Boerma (1993); Caldwell, et al (1990)].

The father's education, mother's education and their job status each have autonomous effects upon child survival in developing countries [Sandiford, et al. (1995); Forste (1994); Caldwell, et al. (1983)].

Economic conditions of the family circle also helped in explaining the variation in infant and child death. The nature of housing, diet, access to and availability of water and sanitized conditions as well as medical attention all depend on the financial situation of the household. For example, poor families may reside in crowded, unhealthy housing and, thus, suffer from communicable illness connected with scarce and unhygienic water supplies and with poor cleanliness [Esrey and Habicht (1986)].

JENNIFER (1999) Investigated factors associated with child's death in Rawalpindi, one of the large cities of Pakistan. The study was performed to distinctively look at the processes and contrivance whereby a link was established between child death and its covariates. Study comprise inhabitants with restricted to a lesser income level living in a standardized environment where all household had identical right to use health-related and other facilities. Results found that non-economic aspect like mother's health seeking manners were interrelated to high child mortality.

Currie and Hyson (1999) found that low birth weight was associated with reduced employment, earnings and health status in a group of British children.

The general approaching was that policies escalating birth weight had extensive returns in the long run.

In the developing world, improving maternal education had the medium to improved children's health (World Bank, 1993) suggesting that one possible route to improving birth weight could be to invest in education of mothers.

Naushin and Kiani (1994) studied the survival odds of children under five years of age in relation to chosen individual and family level factors derived from the data in the Pakistan Demographic and health survey of 1990-91. It was found that older maternal age (35+) unexpectedly enhanced the survival of children, while very young mothers (<20) had negative effect on child survival. Mothers of relatively older ages (35+), with secondary and higher education and with adoption of better antenatal and child health care behavior (such as tetanus injection, breastfeeding, immunization, etc) indicated a greater likelihood of the survival of their children. Secondary and higher but not primary education of mothers affected survival rate of child, only in urban areas. In rural areas mother's education was weakly related to child survival. Father education was not a powerful net predictor of child survival in her analysis. However the two household variables toilet facility and source of water supply did not emerge as significant net predictors of child survival in both urban and rural areas.

Zahid (1996) examined the relationship between utilization of facilities related to health by Mothers and death rate of their children in Pakistan. He utilized the data set based on the Pakistan Demographic and Health Survey of 1990-91. Study found that neonatal, infant and child mortality rate was the highest among children of small age mothers (younger than 20 years). Infant and child mortality rate was higher among first and higher order births than among births of 2nd or 3rd order. He found mortality declines as the length of the birth interval increases. Result showed education of mother had profound effect on all categories of child (zero to 5 years). Health care factors such as provision of facilities during the period from conception to baby birth , birth place, care and help in child bearing and immunization also influenced neonatal, infant and child mortality.

Dow et al. (1999) found that a mother's consumption of tetanus vaccination increases survival chances of the child after birth, which motivated the mother to further invest in prenatal care. If inputs that complement prenatal care in improving child zhealth were not available, mothers had little incentive to invest in prenatal care. Examples of these inputs included tetanus vaccination of the mother during pregnancy, sanitary obstetric care, and child immunizations.

Toros and Kulu (1988) found that father's education stand out as one of the most important factors associated with infant life. They reported that babies whose fathers didn't have primary school education were 1.6 times more likely to die within the first year of life than babies whose fathers had at least 5 years of schooling. Babies whose mothers had no primary school education, however, were 1.15 times more likely to die in their first year. Nevertheless, even though father's education had more explanatory power than mother's education in their study, women education was more stressed. Mother's level of education was considered as one of the most leading factors affecting child health.

Doyle and Harmon (2007) also investigated the relationship between important characteristics of parents relevant to education and income, and child health. Data from the Health Survey of England (HSE) was used for assessment by simple regression (OLS)and IV method. Some support was found for the idea that maternal education was more important for child health as compared to education of both mother and father.

Hobcraft, McDonald and Rutstein (1984) showed in their cross-national study that in Latin American countries, mother's education had more explanatory power, while in some Asian and Islamic countries, father's education and occupation and mother's work status emerged as rival predictor variables.

Data, Methodology and Variables Used

Using the *Pakistan Demographic and Health Survey (PDHS) - 2006-07 which* includes topics connected to fertility levels and determinants, family planning, productivity preferences, infant, child and maternal death and their reasons, Mother and youngster health, vaccination and dietetic status of mothers and children, awareness of HIV/AIDS, and malaria.

To determine the impact of socio-economic and demographic factors on infant mortality at urban and rural regions of Pakistan, Binary Logistic Regression was used. An infant mortality (Dependent Variable) is dichotomous variable defined as If child is alive after birth then child status Alive = 1 and If dead after birth then Dead = 0.The independent variables distributed into two main categories i.e. Socio-economic factors and Demographic factors.

Table 1. Frequency Distribution of socio economic Factors in Pakistan

Parental Education Level	Pk urban	Pk rural
Mother education no	49.3	79.2
Primary	15.2	12.0
Secondary	8.8	3.5
Higher	26.7	5.2
Father education no	26.9	43.5
Primary	13.9	17.3
Secondary	34.1	28.6
Higher	25.2	10.7
Source of water treated water	93.8	89.4
Untreated water	6.2	10.6
Electricity no	5.1	17.0
Yes	94.9	83.0
own house	73.6	89.0
other wise	26.4	11.0
Father occupation not working	3.4	4.4
permanent/salaried	72.6	41.9
casual/inconsistent	.0	53.7
Mother occupation not working	76.2	66.6
permanent/salaried	18.8	13.9
casual/inconsistent	5.0	19.5
Social status poor	11.7	57.2
middle	16.7	21.4
rich	71.6	21.4
No of household <=10	73.2	70.4
>10 & <20	22.6	24.4
>20	4.2	5.1
Access to health facility	96.8	92.2
yes no access	3.2	7.8
Place of delivery home	44.7	72.7
govt. hospital	17.8	8.7
pvt. hospital	37.4	18.6
Assistance during delivery doctor no	45.0	73.2
Yes	55.0	26.8
Asst N/MW/LHV no	82.2	89.0
Yes	17.8	11.0
Asst TBA no	63.5	42.5
Yes	36.5	57.5
Prenatal Care doctor no	27.3	51.7
Yes	72.7	48.3
N/MW/LHV no	94.3	93.6
Yes	5.7	6.4
TBA no	95.3	95.8
Yes	4.7	4.2
Child survival status Dead after birth	5.1	6.8
Alive	94.9	93.2

Table 2. Frequency Distribution of demographic Factors Determining child health status in Pakistan

	Pk urban	Pk rural
Mother age at birth <20	2.1	3.1
>20 & <35	50.3	52.9
>35 years	47.6	44.0
Child size small	61.5	55.0
Average	24.6	28.2
Large	13.9	16.8
Sex male	55.7	53.4
Female	44.3	46.6
Induced birth no	39.2	47.7
yes	60.8	52.3
Birth interval <18 months	16.2	14.7
> 18 & <36 months	41.4	47.2
> 36 months	42.4	38.0
Birth order 1st child	13.2	13.7
2nd to 4th child	47.2	39.9
more than 4 child	39.6	46.4
Elder sibling died no	75.3	68.0
Yes	24.7	32.0

Socioeconomic variables include dummies for the levels of education attained by the mother and the father, father and mother occupation, social status, total household members, province, region of residence, access to health facility, Source of drinking water and electricity. Demographic factors include dummies for the age of the mother at the time of birth, the sex of the child (CHSEX), number of children born to the mother that have died (NESD), birth order of the child (BO), birth interval(BI),.

Results and Discussions

The survival status of children is considered as one of the key indicator of social well being. This indicator has become an issue of great apprehension in all over the world. Following are indicative frequency distributions, showing the child survival status in Pakistan, the determinants of factors effecting infant mortality at urban and rural level of Pakistan.

The results in Table 2 elaborated that most of the children having status of dead after birth belongs to rural type of resident. while greater ratio of alive births are in urban areas. This discrimination is because of differences in health relating behavior among individuals of rural and urban population. In Pakistan 67.6 percent of mothers and 37.1 percent of fathers were illiterate. And illiteracy rates were higher in rural areas.

It was elaborated that in Pakistan 91.1 % of population having treated source of water, 87.7 % has electricity facility and 83.1% of population having own house. When we compared the percentage of population having access to basic needs in Pakistan at urban and rural level the figure showed that in urban areas condition was better. In Pakistan only 4 % of fathers were found unemployed while 70.3 % of mothers were not working. The percentage of fathers not working was high in rural areas about (4.4%) however the mothers with higher ratio of not employed was in urban areas about(76.2%).

It was illustrated that 39.5 % of population belonged to poor social status, 19.5% to middle class and 40.9 % were rich. It was also revealed from the above results that access to health facility was better in urban areas about 96.8 % population has access to health inputs as compared to rural area where 92.2 % population availed health services .

The trend towards place of delivery was found that 62.9 % of population prefer to deliver at home while 11.9% at govt. hospital and 25.2 % In private hospital.

It was explained by the above result that Place of delivery at home was higher at rural areas about 72.7% while in urban areas it was 44.7%. Trend of population for taking assistance by doctor during Delivery In Pakistan was 36.6 % , by nurse/midwife/LHV was 13.4 % and highest 50.2 % by traditional birth attendant(Dai). However trend towards traditional birth attendant(Dai) was higher in rural areas about 57.5 % and 36.5 % in urban areas. The trend for taking Prenatal care by doctor during pregnancy was found 56.8%, by nurse/midwife/LHV was 6.1 % and 4.4 % trend was found for taking prenatal care by traditional birth attendant(Dai).

Frequency Distribution of Demographic Factors in Pakistan was explained in table 3. It was found that in Pakistan 2.7% of the mothers at child birth were less then twenty years. While 51.9 % of the mothers at child birth were greater then twenty and less then Thirty-five years old and 45.4 % were of greater then 35 years old. Mothers having age of less then 20 and greater then 20 and less then 36 was higher in rural areas. while greater then 36 year old mother age at the birth of child was higher in urban areas. Child having small birth size were 57.5 % of the newborn children while average and large size were 26.8 15.7per cent respectively. In all over Pakistan 54.3 % children were male and 45.7% were female. In Pakistan percentage of induced birth cases were 55.3%, Induced births were higher in urban areas about 60.8% as compared to rural areas about 52.3% births were induced. Trend of birth interval generally greater then 18 and less then 36 months. Birth interval less then 18 months and greater then 36 month belonged to urban areas. In Pakistan percentage of population having 1st birth order was 13.5 %, 2nd to 4th child (42.7%) and more then 4 child ranking was about (43.8%). Percentage of population having more then 4 children belonged to rural areas and ratio of population having higher no of elder sibling died also belonged to rural areas.

Infant Mortality Estimation with Binary Logistic Regression

The direct assessment of the likelihood of infant mortality will also be calculated for each category of explanatory independent variables. A binary logistic regression model was employed to estimate the net effect of each of the explanatory variables on infant mortality.

$$Infant\ Mortality = \log_{it}\left[\, p\left(Alive=1\right)\right] = \log\left[\frac{p\left(Alive=1\right)}{1-p\left(Alive=1\right)}\right]$$

$$= \alpha + \sum_{k=1}^{K} \beta_k (X)_{ik} \cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots Eq(4.4)$$

$$Infant\ Mortality\left(DV\right)\cdots\cdots\cdots N = 0,1$$

$$Infant\ Mortality = \begin{Bmatrix} 0\cdots\cdots\cdots if\ alive \\ 1\cdots\cdots\cdots if\ dead \end{Bmatrix}$$

with socioeconomic factors

$$= \alpha + \beta_1(MEDU) + \beta_2(FEDU) + \beta_3(RGN) + \beta_4(TRGN) + \beta_5(SOWTR)$$
$$+ \beta_6(ELEC) + \beta_7(FOCPU) + \beta_8(MOCPU) + \beta_9(SOS) + \beta_{10}(NOHHM)$$
$$+ \beta_{11}(SS) + \beta_{12}(POD)\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots Eq(4.5)$$

with demographic factors

$$= \alpha + \beta_1(MAGE) + \beta_2(IB) + \beta_3(CHSIZ) + \beta_4(CHSEX) + \beta_5(BI) + \beta_6(BO)$$
$$+ \beta_7(ELDSD)\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots\cdots Eq(4.6)$$

Results of a binary logistic regression, for the socioeconomic factors against the infant mortality, in urban Areas of Pakistan were showed in table 3.Results showed that mother no education decreased probability of children alive, primary education increased and secondary education reduced the chance of child's survival. If increased in father educational levels it reduced chances of child's alive birth in fewer ratio.

If father was not working it reduced the probability of child's alive birth and if working it increased the chances of child's survival and if mother was not working it increased the probability of child's alive and if working it reduced the chances of child's survival.

In province NWFP there was highest chances of child's mortality then in Sindh. Punjab has lowest chances of child mortality. Type of region urban reduced the probability of alive birth. Treated source of water Increased the probability of alive birth. Electricity facility increased the probability of child's alive birth. Status of house (no) reduced the probability of child's alive birth. Number of household member less then 10 decreased the probability of alive by large rate and Number of household member >10 & <20 reduced the probability of alive but less rate.

Table 3. Socioeconomic factor and Infant Mortality in Urban Areas of Pakistan (Binary Logistic Regression)

Independent variables	Coefficients	Std. Error	Sig.	Odd Ratio's
Constant	2.085	0.192	0	8.041
MNEDU	1.354	0.069	0	3.872
MPEDU	0.975	0.077	0	2.65
MSEDU	0.768	0.096	0	2.154
FNEDU	-0.312	0.079	0	0.732
FPEDU	-0.642	0.08	0	0.526
FSEDU	-0.141	0.072	0.051	0.868
FOCCPN(1)	-0.427	0.106	0	0.653
FOCCPN(2)	0.639	0.046	0	1.895
MOCCPN(1)	0.314	0.081	0	1.369
MOCCPN(2)	0.209	0.087	0.017	1.232
RGN(1)	0.277	0.074	0	1.32
RGN(2)	-0.283	0.073	0	0.754
RGN(3)	0.375	0.083	0	1.456
SWTR(1)	-0.444	0.104	0	0.641
ELEC	0.784	0.076	0	2.191
SoH	0.349	0.048	0	1.418
NoHHM(1)	-0.811	0.138	0	0.445
NoHHM(2)	-0.342	0.142	0.016	0.71
SS(1)	-0.604	0.057	0	0.547
SS(2)	0.412	0.062	0	1.51
HF	0.526	0.138	0	1.692

Social status poor decreased the probability of child's alive and social status middle increased the probability of alive. Access towards health facility increased chance of survival.

Results of a binary logistic regression, for the demographic factors against the infant mortality, in Urban Areas of Pakistan were explained in table 4.

Table 4. Demographic factor and Infant Mortality in Urban Areas of Pakistan (Binary Logistic Regression)

Independent variables	Coefficients	Std. Error	Sig.	Odd Ratio's
Constant	22.021	144.708	0.879	3.66E+09
MAGE(1)	-1.259	0.196	0	0.284
MAGE(2)	-0.268	0.048	0	0.765
BI(1)	1.192	0.056	0	3.294
BI(2)	0.576	0.041	0	1.779
BO(1)	-1.253	0.041	0	0.286
CHSEX(1)	0.317	0.038	0	1.373
CHSIZE(1)	-0.574	0.054	0	0.563
CHSIZE(2)	-0.276	0.056	0	0.759
IB	0.367	0.037	0	1.444
ELDSD	-20.127	144.708	0.889	0

The result in above table revealed that increased mother age further enhances the chances of child survival. Higher birth interval reduced the child survival chances. Birth order 1st(1st child) reduced the probability of alive birth. Child sex male, child size medium and induced birth increased the probability of alive birth. Elder sibling died has very minor effect to reduced the chances of alive birth.

The odd ratio for the variable mother age less then 20 year indicated that the odds of the event of child survival significantly decreased about 0.284 due to a unit change(decrease) in mother age. The odd ratio for the mother age greater then 20 and less then 35 year indicated that the odds of the event of child survival decreased about .765 due to a unit change(decrease) The coefficient of birth interval less then 18 months showed that it increased the chances of alive birth.

While birth interval greater then 18 and less then 36 months decreased the child survival chances.(this situation is different as compare to the case of country level analyses).The odd ratio of birth order (1st child) indicated that the odds of the event of child survival decreased about 0.286 times.The odd ratio of child sex male indicated that the odds of the event of child survival increased about 1.373 times.

The odd ratio of child size one(small) indicated that the odds of the event of child survival decreased about 0.563 times and the odd ratio of child size two (medium) indicated that the odds of the event of child survival decreased about .759 times. The odd ratio of induced birth showed that the odds of the event of child survival increased about 1.444 times.

Results of a binary logistic regression, for the socioeconomic factors against the infant mortality, in rural Areas of Pakistan are showed in table 5.

Table 5.Socioeconomic factor and Infant Mortality in Rural Areas of Pakistan (Binary Logistic Regression)

Independent variables	Coefficients	StdError	Sig.	OddRatio's
Constant	3.155	0.094	0	23.448
MNEDU	0.305	0.06	0	1.356
MPEDU	0.412	0.064	0	1.51
MSEDU	0.321	0.082	0	1.378
FNEDU	-0.737	0.045	0	0.478
FPEDU	-0.588	0.047	0	0.556
FSEDU	-0.263	0.046	0	0.769
FOCCPN(1)	0.069	0.056	0.218	1.071
FOCCPN(2)	-0.086	0.02	0	0.918
MOCCPN(1)	0.512	0.022	0	1.668
MOCCPN(2)	0.051	0.028	0.068	1.052
RGN(1)	0.058	0.027	0.031	1.059
RGN(2)	0.321	0.029	0	1.379
RGN(3)	0.681	0.032	0	1.975
SWTR(1)	0.477	0.027	0	1.611
ELEC	0.195	0.023	0	1.216
SoH	-0.464	0.032	0	0.628
NoHHM(1)	-0.52	0.035	0	0.595
NoHHM(2)	-0.161	0.037	0	0.851
SS(1)	-0.219	0.037	0	0.803
SS(2)	-0.145	0.039	0	0.865
HF	0.449	0.039	0	1.567

Results of above table showed that mother's primary education increased and secondary education reduced chance of child's alive birth. Increased level of father education reduced chances of alive birth in fewer rates. If father was not working it reduced the probability of alive birth and if working it increased the chances of survival and if mother was not working it increased the probability of alive and if working reduced chances of survival.

In province NWFP there was highest chances of child's mortality then in Sindh. Punjab has lowest chances of child mortality. Treated source of water and Electricity facility increased the probability of alive birth. Status of house (no) reduced the probability of alive birth.

Number of household member less then 10 decreased the probability of alive by large rate and Number of household member >10 & <20 reduced the probability of alive but at less rate. Poor Social status decreased the probability of alive and Social status Middle reduced the probability of alive at low rate. No Access to health facility reduced the chances of alive birth.

Table 6 showed the results of a binary logistic regression, for the demographic factors against the infant mortality, in rural Areas of Pakistan. The results revealed that increased in mother age increased the chances of child survival. Higher birth interval increased the child survival chances. Birth order 1st (1st child) increased the probability of alive birth. Child sex male decreased the probability of alive birth. child size medium and induced birth increased the probability of alive birth. Elder sibling died has very minor effect to reduced the chances of alive birth.

Table 6. Demographic factor and Infant Mortality in Rural Areas of Pakistan (Binary Logistic Regression)

Independent variables	Coefficients	Std. Error	Sig.	Odd Ratio's
Constant	3.35	0.045	0	28.516
MAGE=1	-0.679	0.03	0	0.507
MAGE=2	-0.164	0.013	0	0.849
BI(1)	-0.482	0.025	0	0.618
BI(2)	0.024	0.02	0.228	1.025
BO(1)	0.059	0.02	0.003	1.06
CHSEX(1)	-0.037	0.019	0.051	0.963
CHSIZE(1)	0.042	0.024	0.086	1.043
CHSIZE(2)	0.663	0.026	0	1.94
IB	0.063	0.019	0.001	1.065
ELDSD	-20.067	101.777	0.844	0

The odd ratio for the variable mother age less then 20 year indicated that the odds of the event of child survival significantly reduced about 0.507 due to a unit change(decrease) in mother age. The odd ratio for the mother age greater then 20 and less then 35 year indicated that the odds of the event of child survival decreased about .849 due to a unit change(decrease) in mother age.

The coefficient of birth interval less then 18 months showed that it decreased the chances of alive birth. While birth interval greater then 18 and less then 36 months increased the child survival chances. The odd ratio of birth order (1st child) indicated that the odds of the event of child survival increased about 1.06 times. The odd ratio of child sex male indicated that the odds of the event of child survival reduced about .963 times.

The odd ratio of child size one(small) indicated that the odds of the event of child survival increased about 1.043 times and the odd ratio of child size two (medium) indicated that the odds of the event of child survival increased about 1.94 times. The odd ratio of induced birth showed that the odds of the event of child survival increased about 1.065 times.

Conclusions and Discussion

The research study explored the factors effecting infant mortality based on the data taken from *Pakistan Demographic and Health Survey (PDHS) 2006-07.* Overall results showed that increase in the level of parental education reduced the likelihood of child's death. Increase in level of Father Education however, reduced the probability of child's death in both urban and rural areas. As father education was considered proxy of his income so educated father would spend more on health services. Number of household member less then 10 Increased the probability of death of baby and >10 & <20 reduce the probability of death after birth. Large family size may be expressed as it facilitated mother for household work and provided her with better care during pregnancy. Treated source of water and Electricity reduced the probability of child's death. Access to health facilities by mother (having hospital or family planning centre near to home) reduced the probability of child death. It was confirmed from results that if father was working it reduced the probability of child's death. On contrary to this an amazing result was found that for working mother the possibility of child's death after birth was higher. Reason being that Mothers working during pregnancy had less time to care for herself and get health facilities for her sibling. Further the work loads both at her job and at home increased the physical and mental stress that also passed to infant in her womb resulting in poor health.

Mothers of older age (>20 & <35) reduced the chances of death after birth. Less than 18 months Birth interval enlarged the probability of child's death. While wider Birth interval (>18 & <36 months) diminished the probability of child's death. Increased birth interval provided better chances to improve the health of both mother and child by widening the gap between two consecutive pregnancies and also time to improve health during and after breast feeding of first child.

Birth order for 2nd to 4th child reduced the probability of child's death after birth as compared to 1st child birth and more then fourth birth order. Small child size increased the probability of death after birth. No induced birth reduced the probability of death after birth. While in Urban area no induced birth increased the probability of death after birth. No elder sibling died has a very little effect to reduce infant mortality.

In the context of above findings and discussion, the study suggests the following policy implications: It is recommended to provide trouble-free access and availability of health care, especially maternity care services to reduce infant mortality particularly in rural areas. It is also advisable to provide knowledge, training and skills to Traditional birth attendants, and to enhance their contacts with professional health staff.Repeated and closely spaced pregnancies should be discouraged and contraceptive prevalence needs to be increased especially in conservative areas. Provision of antenatal care should be uniform and optimal. Literacy rate should be improved so that awareness about reproductive health and use of available health resources could be optimised.

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