



Advance Journal of Econometrics and Finance

Vol-4, Issue-1, 2026

Advance Journal of Econometrics and Finance

Online ISSN

2959-8990

Print ISSN

2959-8982

<https://ajeaf.com/index.php/Journal/About>

Name of Publisher: SCHOLAR CRAFT EDUCATION & RESEARCH HUB

Review Type: Double Blind Peer Review

Journal Frequency: Quarterly Research Journal (4- Issue)



Child Mortality and its Socio-Economic, Maternal and Environmental Determinants in Pakistan: An Empirical Evidence from Micro Level Data

¹Dr. Saba Shaukat, ²Dr. Asmat Ullah, ³Dr. Muhammad Irfan Chani

	Abstract
<p>Dr. Saba Shaukat Department of Economics, COMSATS University Vehari Campus, Pakistan. saba17@cuivehari.edu.pk</p> <p>Dr. Asmat Ullah Qurtuba University, D.I. Khan, Pakistan. asmateco1431@gmail.com</p> <p>Dr. Muhammad Irfan Chani* Department of Economics, COMSATS University Vehari Campus, Pakistan</p>	<p>Although child mortality has declined over time throughout the world, it still persists in less developed nations. The fundamental reasons include a high child growth rate, poor maternal health, household financial problems, and a lack of basic health facilities, all of which contribute to the continued prevalence of child mortality in these countries. The current study was carried out in Pakistan to explore the impact of socioeconomic, maternal and environmental aspects over child mortality. The data for this purpose were taken from Pakistan Social and Living Standard Measurement Survey (PSLM) and Household Integrated and Economic Survey (HIES) 2018-19. The overall 8150 households were taken as a sample size. The data were analyzed through Binary Logistic Regression Model using Maximum Likelihood Estimation Technique (MLE). The results of the model showed that gender of the child, mother having mobile phone, mother used toxoid injection, doctor assist in delivery, mother breast feedings, used hand pump water as source of drinking, gas connection, child born in private healthcare center, access to internet facility and residence of the household in Baluchistan province found significant determinants of child mortality. On other side, gender of the head, trained Dai assist in delivery, motor pump and filtration plant as source of water, child born in government healthcare center, regional location, and the residence of the household in KPK and Sindh provinces found insignificant in Pakistan.</p>
<p>Keywords:</p>	<p>Child mortality, PSLM, HIES, Binary Logistic Regression, Maximum Likelihood Estimation, Pakistan</p>

1. Introduction

Providing basic healthcare facility free or at minimum cost is the responsibility of the state but less developed nations are not able in this regard and the basic reasons are lack of preferences and financial resources. Based on the above mentioned issues in healthcare sector, one of the burning issues is child mortality throughout the world general and in less developed nations special. The basic reasons of high child mortality among the female belong in the less developed nations are lack of efficient healthcare facilities during pregnancy, at the time of delivery and after the delivery. The issue of child mortality is among the most burning social problems in Pakistan that signifies the continuous presence of socio-economic disparities, household-based weaknesses, and the deficiencies in the system of providing maternal and child healthcare services. Nevertheless, even with the improvement of the last decades, Pakistan remains one of the countries with the highest mortality issues of children. The Pakistan Demographic and Health Survey (PDHS 2018) found that the under-five mortality rate was 74 deaths per 1,000 live births, which is much more extensive than the Sustainable Development Goal (SDG) of 25 per 1,000 live births. This continues to raise the alarm, thus necessitating a need to investigate the socio-economic and household conditions that may have led to the death of children (UNICEF, 2023).

According to a significant amount of evidence, socio-economic factors like household income, parental education, maternal employment rate, and rural-urban differences are the major determinants of child mortality in Pakistan (Awan & Akbar, 2020; Javed and Mughal, 2021). The poor households expose their children to more malnutrition, infectious diseases, environmental risks and lack of preventive and curative healthcare services-factors that greatly increase the chances of early childhood mortality (World Bank, 2022). Mother education has always been determined as a protective factor, aware mothers are more likely to have healthier childcare behaviors, vaccinate their children, obtain early healthcare, and have better hygiene and nutrition practices with their children (Khan et al., 2021).

In addition to broader socio-economic conditions, household-level characteristics play a critical role in shaping child survival. Factors such as household size, birth order, birth spacing, and availability of improved water sources, sanitation facilities, and quality of housing have direct implications for child health outcomes (Ali & Rehman, 2015; Yusuf et al., 2020). Overcrowded households and inadequate sanitation increase exposure to diarrheal diseases, respiratory infections, and other preventable illnesses, which remain leading causes of child mortality in Pakistan (WHO, 2021). Similarly, short birth intervals and high parity are associated with increased neonatal and infant mortality due to biological depletion of maternal health and reduced caregiving capacity (NIPS & ICF, 2019). Household-level factors are very important in determining the survival of children besides the overall socio-economic conditions. The household size, birth order, birth spacing, access to better water sources, sanitation facilities, and quality of housing directly impact the child health outcomes (Ali, 2015; Yusuf et al., 2020). Due to overcrowded family spaces and poor sanitation, children are exposed to diarrheal diseases, respiratory infections, and other preventable illnesses, which continue to be the major causes of child mortality in Pakistan (WHO, 2021). On the same note, low birth intervals and high parity are the factors that cause more mortality to the neonatal and infant mortality rates because the maternal health is biologically depleted, and the caregiving capacity is low (NIPS & ICF, 2019).

In addition, the maternal health behaviors and household resource distribution are influenced by socio-cultural norms, including gender inequality, low decision-making power of women, and early marriages, which impact the child survival (Marc & Ali, 2016; Siddiqui and Mahmood, 2018; Ali & Senturk, 2019). Such intersecting socio-economic and household-level factors establish a complicated environment where the death of children can still be prevented. The child mortality situation is multifactorial, and thus it is necessary to examine the socio-economic and household factors to determine their interaction in impact within Pakistan on child health outcomes. The research undertaken is an effort to examine these determinants holistically and give evidence-based recommendations that can be used to implement targeted interventions and policy measures that would help in reducing child mortality and improving the pace at which Pakistan is achieving the global child health objectives.

2. Literature Review

Child mortality has remained a central point of discussion among researchers in both past and present. Previous studies have concluded that socioeconomic, environmental, demographic, and healthcare factors are the major determinants of child mortality throughout the world. Although extensive literature exists on child mortality and its determinants, some of the previous and recent studies are included in this section.

Evazpoor et al. (2016) conducted a study to investigate the impact of socioeconomic determinants on child mortality among children under five years of age in Kohgiluyeh and Boyer-Ahmad Province. A total of 150 households were taken as the sample. The data were analyzed using the Student's t-test, Chi-square test, and multivariate logistic regression analysis. The results of the study indicated that parental consanguinity and domestic violence had a significant impact on child mortality, while the gender of the child, pregnancy interval, family size, birth rank, mother's age, mother's education, and maternal smoking had no significant effect on child mortality in the study area.

Ahmadi et al. (2015), in their study conducted in Fars Province, explored the impact of household and health-care factors on child mortality. Logistic regression analysis was used for this purpose. The results of the study indicated that maternal age, history of stillbirth, abortion, and the number of children had a significant impact on child mortality. On the other hand, parents' education, health index, duration of marriage, and socioeconomic status had no significant impact on child mortality in the study area. Safari et al. (2014) used primary data to investigate the impact of healthcare and household factors on child mortality in the villages of Semnan. The data were analyzed using logistic regression, and the results showed that type of nutrition, birth weight, adverse growth, and prematurity significantly affected child mortality in the study area. Furthermore, the gender of the child, type of delivery, place of birth, pregnancy interval, birth rank, and number of children, parents' education, mother's age, and parents' occupation had no significant impact on child mortality. Damghanian et al. (2014) conducted a study in Semnan Province on child mortality. A total of 3,297 children were taken as the sample, and the Blinder–Oaxaca decomposition method was used to analyze the data. The results showed that the significant determinants of child mortality were birth weight, type of nutrition, mother's education, and socioeconomic status. On the other hand, child gender, parents' age, place of residence, pregnancy duration, maternal care, and type of delivery had no significant impact on child mortality in the study area. The study by Chaman et al. (2014) in the rural areas of Kohgiluyeh and Boyerahmad Province investigated the role of maternal factors and health-care factors on child mortality. Conditional logistic regression analysis was used for this purpose. The results of the study concluded that child mortality was significantly affected by prematurity, birth weight, birth rank, and pregnancy interval, while other factors such as the gender of the child and the mother's age had no significant impact. Nakhzari-Moghaddam et al. (2019) investigated the impact of socio-demographic determinants of child mortality in Zabol, Sistan and Baluchistan. A total of 2,001 children were taken as the sample. The data were analyzed using the chi-square test, t-test, and binary logistic regression model. The results of the study confirmed that father's addiction, mother's education, family size, and family status significantly affected child mortality in the study area. However, mother's addiction, father's smoking, mother's smoking, and mother's education were found to have no significant impact on child mortality. The study by Dadipoor et al. (2018) indicated that child mortality and its key indicators negatively affect society as a whole. This study was based on primary data and was analyzed using the Chi-square test. The results of the Chi-square analysis revealed that birth weight, type of delivery, type of nutrition, pregnancy interval, and parents' education were significant determinants of child mortality. Moreover, the gender of the child, socioeconomic status, and both father's and mother's smoking were found to be insignificant in this regard. Anafcheh et al. (2018) conducted a study in Khuzestan to explore the impact of maternal factors and healthcare aspects on child mortality. A cross-sectional dataset of 1,973 children was taken as the sample, and Chi-square and logistic regression techniques were used to analyze the data. The results of the study indicated that maternal age, marriage duration, pregnancy duration, type of delivery, and mother's occupation significantly affected child mortality in the study area. Moreover, father's education, mother's education, father's occupation, and socioeconomic factors had no significant impact on child mortality.

Ghotbi et al. (2017), in their study conducted in Kurdistan province, used primary data with a sample size of 198 respondents. The data were analyzed using Chi-square and logistic regression. The findings indicated that the majority of the independent variables were significant, including household location, mother's education, and mother's smoking behavior, and pregnancy interval. On the other hand, father's occupation, mother's occupation, and father's education were found to be insignificant in this regard. Wahl et al. (2023) in their study in India and researched at the conclusion that regional disparities, socio-demographic inequalities, malnutrition, poor sanitation and lack of pour water were the major determinants of child mortality. The study of Girma et al. (2023) in Ethiopia used cross sectional data and reached at the conclusion that gender of the head, marital status, birth orders and mode as well as place of delivery significant impact the child mortality. Srivastava (2021) conducted a study about child survival in India. This study used cross sectional data and reached at the decision that maternal education, birth interval and household wealth found significant determinants of child survival in India. Rahman and Alam (2021) explored the impact mothers and household factors over the child mortality in Bangladesh. The results of the study concluded that urbanization and total fertility rate increases the child mortality. Moreover, the female education, female life expectancy and increases in economic growth reduced the child mortality in study area.

2.1. Research Gap

Although a vast literature is available on child mortality worldwide, very few studies have been conducted in the case of Pakistan. Khan et al. (2018) investigated the role of household factors in child mortality in Pakistan using the Pakistan Demographic and Health Survey (PDHS) 2012–13. Similarly, Iram and Butt used the Pakistan Integrated Household Survey 2000–01 to examine the impact of socioeconomic and demographic factors on infant and child mortality in Pakistan. As mentioned above, these studies used old data sources and focused mainly on household factors. Therefore, the present study contributes to the child mortality literature in two ways: first, it uses the latest dataset extracted from the PSLM survey 2018–19; and second, it incorporates household factors, maternal factors, and healthcare factors to analyze child mortality in Pakistan.



Advance Journal of Econometrics and Finance

Vol-4, Issue-1, 2026

2.2. Objective of the study

To investigate the empirical impact of household factors, maternal aspects, basic service factors, and health care factors on child mortality in Pakistan.

3. Research Methodology

3.1. Study Design

The research design used in the study is a quantitative and cross-sectional research design to study the socio-demographic and household determinants of child mortality in Pakistan. The research is conducted through secondary data which is collected as national representative household surveys. Since child mortality is known to be a binary outcome, that is, child alive or child not alive, the research uses the appropriate econometric technique that are applicable in binary dependent variables.

3.2. Data Sources

This paper is based on the following national surveys conducted by the Pakistan Bureau of Statistics (PBS):

Pakistan Social and Living Standards Measurement Survey (PSLM) 2018/19.

Household Integrated Economic Survey 2018/19 (HIES)

The two surveys offer all the information on household characteristics, socio-economic status, education, health care facility, and access to basic services. The uses of above mentioned data sets make it possible to have a strong evaluation of the factors that determine child mortality at household levels.

3.3. Sampling Technique and Sample

PSLM and HIES surveys are both stratified multistage cluster surveys to achieve both national and provincial representativeness. During the first stage, probability proportional to size (PPS) is used to select enumeration blocks in the urban areas and villages in the rural areas. The houses are chosen randomly among each primary sampling unit in the second stage. The analysis uses sampling weights offered by PBS to compensate unequal probabilities of selection as well as to achieve representativeness of the results. The total numbers of household included as sample are 8150.

3.4. Variables Specification

3.4.1. Dependent Variable

Our dependent variable is dichotomous in nature such, child mortality, defined as a binary outcome variable:

- Child Alive = 1
- Child Not Alive = 0

This variable captures whether a child born to a sampled woman has died before the survey date.

3.4.2. Independent Variables

Based on existing literature and data availability, the following categories of independent variables are included:

3.4.2.1. Demographic Factors

- Gender of the child
- Gender of the head

3.4.2.2. Maternal Characteristics

- Used Toxoid injection during pregnancy
- Place of delivery (home or health facility)
- Assistance in delivery
- Breast feeding

3.4.2.3. Household and Environmental Factors

- Source of drinking water
- Availability of Mobile phone
- Uses of internet facility
- Access to water facility

- Source of cooking
- Urban–rural residence
- Province based location

3.5. Data Analysis Techniques

Due to the nature of the problem and dependent variable, we have applied binary logistic regression model to investigate the impact of socio-demographic, maternal factors, and household and environmental aspects over the child mortality in Pakistan.

3.5.1. Econometric Model

Keeping in consideration the above mentioned aspects, the econometric model of child mortality looks like that:

$$Y = \ln \left[\frac{P}{1-P} \right] = \beta^0 + \beta_1 X_1 + \dots + \beta_k X_k + e_i \dots\dots\dots (1)$$

(P): the probability that the child is alive (Y=1),

1-p: probability of child is not alive (Y=0),

X1 to Xk: represents the set of explanatory variables,

β_1 to β_k : the parameters to be estimated

e_i is the error term.

The estimated coefficients are interpreted using odds ratios, which indicate the likelihood of child mortality associated with changes in explanatory variables.

3.6. Detailed Description of the Dependent and Independent Variable with their Unit of Measurement

Table 1: Description of the Variables

S. No	Dependent variable	Unit of measurement
1	Dependent variable Y= Child Mortality	Y= 1, if child is alive, and otherwise 0, and 0 is not alive
2	Independent variable	
2.1	X3= Gender of the child	X3= 1if child is male, 0 otherwise
2.2	X4= Mobile phone	X4= 1, if the respondent has mobile phone, 0 otherwise
2.3	X5= Toxid Injection	X5= 1, if respondent has injected Toxid injection,0 otherwise
2.4	X6= Dr_Delivery	X6= 1, if Assist Dr in delivery, 0 otherwise and 0= Trained Birth Attendant (TBA)
2.5	X7= Trained Dai	X6= 1, if Assist by Trained Dai in delivery, 0 otherwise and 0= Trained Birth Attendant (TBA)
2.6	X8= Breastfeeding	X8=1, if mother breastfeeding the child, 0 otherwise and 0= not breastfeeding
2.7	X9= hand pump	X9= 1, if respondent has hand pump, 0, otherwise and 0=pipe water
2.8	X10= Motor pump	X10= 1, if respondent has Motor pump, 0, otherwise and 0=pipe water
2.9	X11= Filtration plant	X11= 1, if respondent has filtration plant, 0, otherwise and 0=pipe water
2.10	X12= Gas	X12= 1, if respondent has Gas for cocking, 0, otherwise and 0=Firewood
2.11	X16= Govt health care	X16= 1, if child born in govt hospital, 0 otherwise, and 0= child born at home
2.12	X17= Private health care	X16= 1, if child born in private hospital, 0 otherwise, and 0= child born at home
2.13	X18= internet facility	X18=1, if the respondent has the internet facility, 0 otherwise and 0=no internet
2.14	X19= Urban	X19=1, if the respondent location is urban, 0 otherwise and 0=Rural
2.15	X20= KPK	X20=1, if the respondent belongs to KPK, 0 otherwise and 0=Punjab
2.16	X21= Sindh	X21=1, if the respondent belongs to Sindh, 0 otherwise and 0=Punjab
2.17	X22= Baluchistan	X22=1, if the respondent belongs to Baluchistan, 0 otherwise and 0=Punjab

3.7. Limitations of the Study

Despite its strengths, the study has certain limitations. First, the cross-sectional nature of the data limits causal inference. Second, child mortality information is based on self-reported data, which may be subject to recall bias. Lastly, some relevant health-related variables may not be fully captured due to data constraints.

4. Results and Discussion

The table below presents the results of the binary logistic regression model for child mortality in Pakistan. Child mortality is the dependent variable in this model with two outcomes: 0 and 1. Here, 0 indicates that the child is not alive, while 1 indicates that the child is alive. If the odds ratio is greater than 1, it means a higher likelihood of the child being alive (lower mortality), whereas an odds ratio less than 1 indicates a lower likelihood of the child being alive (higher mortality). The logistic regression identifies the major socioeconomic, demographic, and environmental determinants of child survival in Pakistan using PSLM/HIES 2018–19 data.

4.1. Significant Determinants of Child Survival ($p < 0.05$)

4.1.1. Gender of Child

Gender of the child was found to be a significant determinant of child mortality. The odds ratio for the gender variable is 0.78 and is significant at the 5% level, indicating that being a female child has 22% lower odds of survival relative to a male child. This suggests that there is a higher risk of child mortality among female children in Pakistan. One of the reasons for this higher risk is gender discrimination in nutrition, healthcare-seeking behavior, and immunization practices in Pakistan. The results of the present study align with the findings of previous studies by Alkema et al. (2016), Javed and Mughal (2020), and Khan et al. (2018).

4.1.2. Mobile Phone Ownership

The odds ratio for households having a mobile phone is 1.1528, and it is significant at the 5% level. This indicates that households with a mobile phone have 15% higher odds of child survival compared to those without a mobile phone. Having a mobile phone increases access to up-to-date information related to maternal care during pregnancy and healthcare-seeking behavior after delivery. The findings of Lee et al. (2020) also report similar results regarding child mortality.

4.1.3. Maternal Toxoid Injection

The significant odds ratio 1.28 of maternal toxoid injection at the 1% level of significance indicates that mothers who received tetanus toxoid injections have 28% higher odds of child survival compared to those who did not receive the injection. The results confirmed that toxoid injection has strong impact of mother health during pregnancy. Our results on maternal toxoid injection are supported by the WHO (2019) report and the studies of Awan and Akbar (2020) and Black et al. (2016).

4.1.4. Doctor-Assisted Delivery

The add ratio of Doctor assist in delivery is 0.94 which is slightly below the 1 and significant at 5% level of significance indicating that there are 6% odd of low child death relative to survive as compared to the Trained Birth Attendant. Generally, when a delivery case becomes complicated, the patient is taken to a doctor for delivery. In such cases, there is a higher probability that the baby may not survive during the operation. Due to this reason, there is a 6% lower chance of survival. Our results are supported by the report of NIPS and ICF and study of Khan et al. (2018) in case Doctor assisted in child delivery.

4.1.5. Breastfeeding

Breast feedings significantly affected the child mortality in Pakistan. The significant odd value of breast feeding indicated that there was 39% lower odd of death and 61% higher odd of child survival relative to not breast feeding. Mother's breastfeeding is extremely important for the child. Generally, children who are breastfed are healthier and have a higher chance of survival compared to those who are not breastfed. The studies of Black et al. 2016, Ahmad et al. 2019 and the report of UNICEF 2020 supported our results in case of breast feedings.

4.1.6. Hand-Pump Water Source

Households that rely on hand-pump water show a higher risk of child mortality compared to those using piped water. In these households, there is a 36% chance of child death relative to child survival, indicating a higher risk of child mortality. Generally, hand-pump water is not properly clean or germ-free, which increases the likelihood of vomiting, diarrhea, and other waterborne diseases, ultimately reducing child survival. The findings of Yusuf et al. (2020) and the Pakistan Demographic and Health Survey (2017–18) are consistent with our results regarding hand-pump water as a source of drinking water.

4.1.7. Gas as Cooking Fuel

The significance odd ratio of Gas indicated that the household using gas as cooking fuel have 36.7% higher odd of survival to death as compared those been not using gas. Clean cooking fuel decrease the respiratory infection which ultimately improve the health of mother and decreases the chances of child mortality. Another reason is gas reduces indoor air pollution relative to solid fuels. The same types of findings also exist in the study of Amegah and Agyei-Mensah (2017).

4.1.8. Baluchistan Province

Baluchistan is used as dummy variable and compared with Punjab province. The significant odd ratio of Baluchistan province highlighted that children belong to Baluchistan has 2.28 times higher odd of survival to death as compared to those belongs to Punjab province. Model reference category, data clustering and coding may be the reason of this type of results. Another reason of such unexpected results may be that the model is capturing unobserved heterogeneity. Our results regarding Baluchistan province are contrary to previous studies such as the study of Khan et al. (2018) and the report of Pakistan Demographic Health Survey 2019 in which there were higher odd of child mortality.

4.1.9. Private Health Facilities

The odds ratio of 0.785 with a p-value of 0.050 (marginally significant) indicates that households using private health facilities have about 21% lower odds of child mortality. Compared to childbirth taking place at home, delivery in a private healthcare center reduces the likelihood of child death by approximately 21% in the study area. This suggests that private healthcare facilities may provide relatively better services—such as the availability of qualified doctors, shorter waiting times, and improved hygiene—which collectively contribute to lower child mortality. These findings are consistent with the results reported by Yusuf et al. (2020) and the World Bank (2018), both of which highlight the positive role of private health services in improving child survival outcomes.

4.1.10. Internet Use

The use of internet facilities reduces child mortality by approximately 31%, as indicated by its odds ratio, which is statistically significant at the 5% level. Internet access enhances child survival because families can obtain essential health information, such as vaccination schedules, hygiene practices, safe water-use guidelines, and early symptoms of illness. This improved access to knowledge supports timely and informed health-seeking behavior. The UNICEF (2020) report and the study conducted by Bessette et al. (2018) are consistent with our findings regarding the positive impact of internet accessibility on reducing child mortality.

4.2. Non-Significant Variables

4.2.1. Gender of the head

Gender of the head found to be statistically insignificant ($p = 0.947$) indicating that there was no significant impact of gender of the head on child mortality. In details, no matter the head of the household was male or female, there were 11% lower odd (lower mortality) of child survival relative to death. Similar findings have been reported by Adebayo et al. (2019), Fadel et al. (2020), and Yusuf et al. (2020), who also observed no meaningful association between household headship and child mortality after controlling for socioeconomic conditions.

4.2.2. Trained Dai

The odds ratio of trained Dai assistance was also found to be statistically insignificant ($p = 0.627$), indicating that being assisted by a trained birth attendant does not have a statistically meaningful impact on child survival. Although the odds ratio ($OR = 0.93$) suggests that children delivered by a trained Dai were 7% less likely to die, this effect is not statistically supported. Similar results were reported by Bhutta et al. (2011) and Jokhio et al. (2005), who also found that trained Dai do not significantly influence child survival outcomes.

4.2.3. Motor Pump

The insignificant ($p = 0.537$) odds ratio for *motor pump water* indicates that using motor-pump water as a drinking source has no statistically significant impact on child mortality in Pakistan. In detail, whether a household uses motor-pump water or piped water does not show a meaningful difference in child mortality risk based on the regression results. The uses of others factors such as maternal, socioeconomic and demographic may be the reasons of no significant impact of motor pump water in case of child mortality. The similar findings also reported in the reports of PDHS (Pakistan Demographic and Health Survey) 2017–18 and in the study of Levy et al. (2019).

4.2.4. Filtration Plant

The insignificant ($p = 0.850$) odds ratio for *filtration plant water* indicates that using water from a filtration plant does not have a statistically significant impact on child mortality in Pakistan. In other words, whether a household uses water from a filtration plant or piped water does not show a meaningful difference in child mortality in the model. The

possible reasons may be others factors which has more strong impact on child mortality rather than filtration plant only. Our results are aligning with the report of WHO & UNICEF (2021) and result of the study of Luby et al. 2015.

4.2.5. Regional Location

Regional location of the household also found insignificant. Urban is base category comparative to rural one. The odd ratio of rural found insignificant (0.890) and it indicated that rural location of the household does not have statistically significant impact on child mortality. In other words, whether the household lived in rural region or urban region does not show meaningful difference in child mortality in the model. Several studies (Awan & Akbar, 2020; Khan & Mohanty, 2018; Van de Poel et al., 2007) show that the rural–urban difference in child mortality becomes statistically insignificant when socioeconomic and maternal factors are controlled. This supports the current finding that regional location (rural vs. urban) does not have a meaningful independent effect on child mortality in Pakistan.

4.2.6. Sindh and KPK

The insignificant results for Sindh and KPK indicate that provincial location (relative to Punjab) does not have a statistically significant impact on child mortality in Pakistan. In other words, whether a household belongs to Sindh or KPK does not show a meaningful difference in child mortality once other socioeconomic and demographic factors are included. Due to controlled variables such as healthcare factors, parents related activities and maternal aspects minimize the role of province location of the household in case child mortality. The same types of results were confirmed in the studies of Khan et al. (2018) and Mahmood & Nasir (2020) in case child mortality.

4.2.7. Government Health Facility

The insignificance of the government healthcare variable in the child mortality model can be explained by the fact that child mortality in Pakistan is influenced by multiple structural and household-level factors, not only by access to government health services. In Pakistan, determinants such as maternal education, household income, sanitation and water quality, birth spacing, maternal health practices, and regional disparities play a major role in shaping child health outcomes. When these stronger predictors are included in the model, the independent effect of government healthcare facilities becomes statistically insignificant. Our results are consistence with the findings of studies of Awan and Akbar (2020) and Nolan et al. (2011).

The model is significant ($LR \chi^2(15) = 125.59, p < 0.001$), indicating that the selected predictors meaningfully explain child survival outcomes.

5. Conclusion

The model shows that several factors significantly influence child mortality in Pakistan. Gender of the child, mobile phone use, maternal tetanus toxoid injection, doctor-assisted delivery, breastfeeding, drinking water source (hand pump), gas availability, private healthcare, internet use, and Baluchistan province are statistically significant predictors. Protective factors that reduce the odds of child mortality include being a female child, breastfeeding, using private healthcare, internet access, and clean water sources. Meanwhile, living in Baluchistan significantly increases the odds of child mortality. Other variables—such as gender of the household head, trained Dai assistance, motor pump water, filtration plant; rural residence, and Sindh or KPK residence—do not show significant effects. Overall, the model is statistically significant, though it explains a modest portion of the variation in child mortality (Pseudo $R^2 = 0.0284$). The findings are broadly consistent with prior global and national research, emphasizing the importance of maternal health, safe water, clean fuels, and nutrition practices in reducing child mortality.

Table 2: *Results of Binary Logistic Regression Model in case of Child Mortality in Pakistan*

Variables	Odd Ratio	Standard Error	P-Value
Gender of head	.8879384	.1555469	0.497
Gender of child	.77971	.0659338	0.003***
Mobile Phone	1.152837	.1784321	0.048**
Toxoid Injection	1.279327	.1164663	0.007***
Doctor Delivery	.9458966	.1168625	0.043**
Trained Dai	.9366929	.1239487	0.621
Breast Feedings	.6072101	.0592436	0.000***
Hand Pump	.6403732	.0960432	0.003***

Motor Pump	.9177185	.1276134	0.537
Filtration	1.035898	.1935841	0.850
Gas Connection	1.367176	.1622186	0.008***
Government Healthcare Center	.8550595	.1124153	0.234
Private Healthcare Center	.7851847	.0992166	0.050**
Internet Connection	.6871741	.1458702	0.049**
Rural Area	.9833255	.119636	0.890
KPK Province	1.275843	.1610756	0.054
Sindh Province	1.07072	.1163381	0.529
Baluchistan Province	2.278784	.4305303	0.000***
_cons	12.92817	3.560471	0.000***
Log likelihood -2147.5893	Number of observation	8,150	
LR chi2(15) 125.59 (0.0000)	Pseudo R2	0.0284	

Source: PSLM&HIES2028-19

(***) Significant at 1% level of significance, (**) Significant at 5% level of significance

References

- Adebayo, S. B., Kuku, O., & Oni, G. (2019). Household structure and child mortality in sub-Saharan Africa. *Journal of Population Research*, 36(2), 123–140.
- Ahmadi A, Javadi A. (2015) Trends and Determinants of Infant Mortality Rate in Fars Province during 2001- 2011. *Journal of Rafsanjan University of Medical Sciences*. 14(1):37–46.
- Ali, A. (2015). *The Impact of Macroeconomic Instability on Social Progress: An Empirical Analysis of Pakistan*. Ph.D Dissertation. NCBA&E, Lahore, Pakistan., 1-152.
- Ali, A., & Rehman, H. U. (2015). Macroeconomic instability and its impact on gross domestic product: an empirical analysis of Pakistan. *Pakistan Economic and Social Review*, 285-316.
- Ali, A., & Şenturk, İ. (2019). Justifying the impact of economic deprivation, maternal status and health infrastructure on under-five child mortality in Pakistan: An empirical analysis. *Bulletin of Business and Economics (BBE)*, 8(3), 140-154.
- Alkema, L., Chao, F., You, D., Pedersen, J., & Sawyer, C. C. (2016). National, Regional, and Global Sex Ratios of Infant, Child, and Under-5 Mortality and Identification of Countries with Outlying Ratios: A Systematic Assessment. *The Lancet Global Health*, 2(9), 521–530.
- Anafcheh T, Yaghoubi Doust M, Mojadam M, Mirkazemi R, & Khafaie MA. (2018). Temporal and Spatial Distribution of Under-Five Mortality and Factors Associated With Multiple Cases of Under-Ve Deaths within A Family in the Rural Area of Khuzestan, Southern Iran. *Social Report*. 8(1):17930.
- Awan, M. S., & Akbar, M. W. (2020). Socioeconomic Determinants of Child Mortality in Pakistan: Evidence from Household-Level Data. *Journal of Population and Social Studies*, 28(3), 245–260
- Bessette, A., Wu, W., & O'Donnell, M. (2018). Digital Access and Maternal Health Awareness in Developing Countries. *Global Health Journal*, 12(3), 145–158.
- Bhutta, Z. A., Lassi, Z. S., Pariyo, G., & Huicho, L. (2011). Community-Based Interventions to Reduce Maternal, Newborn, And Child Mortality. *BMC Medicine*, 9(1), 1–6.
- Chaman R, Gholami Taramsari M, Khosravi A, Amiri M, Holakouie Naieni K, & Yunesian M. (2014). Consanguinity and Neonatal Death: A Nested Case-Control Study. *Journal of Family Report Health*. 8 (4):189–93.
- Dadipoor S, Alavi A, Ziapour A, & Safari-Moradabadi A. (2018). Factors Involved in the Mortality of Infants under the Age of One Year in Bandar Abbas-Iran: A Document-Based Study. *International Journal of Pediatrics-Mashhad*. 6(4):7519–27.
- Damghanian M, Shariati M, Mirzaiinajmabadi K, Yunesian M, & Emamian MH. (2014). Socioeconomic Inequality and Its Determinants Regarding Infant Mortality in Iran. *Iran Red Crescent Med Journal*. 16(6):



Advance Journal of Econometrics and Finance

Vol-4, Issue-1, 2026

- Evazpoor A, Edalati A, Hypponen E, Fararouei M, & Parisai Z. (2016) Deaths Of Children Aged Less than 5 Years And Related Factors In The Islamic Republic Of Iran: A Population-Based Case-Control Study. *Eastern Mediterranean Health Journal (EMHJ)*. 22(6):
- Fadel, S. A., Boschi-Pinto, C., Yu, S., Llanos-Casas, P., & Black, R. E. (2020). Determinants of Under-Five Mortality: Evidence from Demographic and Health Surveys. *Global Health Action*, 13(1), 1–12.
- Gharavi A, Shoraka H, Sozadeh A, & Katuli H. (2016). Neonatal mortality risk factors in Maraveh Tapeh County in Golestan province, north of Iran (2011-13). *Journal of Gorgan University of Medical Sciences*. 18(1).
- Girma, M., Eshete, H., Asrat, R., Gebremichael, M., Getahun, D., & Awoke, T. (2023). Socio-Demographic and Environmental Determinants of Under-Five Child Mortality in Ethiopia: Using Ethiopian Demographic and Health 2019 Survey. *BMC Pediatrics*, 23(1), 294.
- Iram, U., & Butt, M. S. (2008). *Socioeconomic Determinants of Child Mortality in Pakistan: Evidence from Sequential Probit Model*. *International Journal of Social Economics*. 35(1/2): 63-76.
- Javed, S. A., and Mughal, M. A. (2021). Influence of Socio-Economic Inequalities on Child Health Outcomes in Pakistan. *Pakistan Journal of Social Sciences*, 41(1), 95–110.
- Javed, S., & Mughal, M. M. (2020). Socio-economic Determinants of Child Mortality in South Asia. *Journal of Asian and African Social Science and Humanities*, 6(2), 45–60.
- Jokhio, A. H., Winter, H. R., & Cheng, K. K. (2005). An Intervention Involving Traditional Birth Attendants and Perinatal Mortality in Pakistan. *New England Journal of Medicine*, 352(20), 2091–2099.
- Khan, J., & Mohanty, S. K. (2018). *Urban–Rural Differentials in Child Mortality in South Asia: A Decomposition Analysis*. *Health & Place*, 52, 14–23.
- Khan, M. A., Safdar, S., & Abbas, F. (2018). Determinants of child mortality in Pakistan: Evidence from Pakistan Demographic and Health Survey. *Pakistan Journal of Public Health*, 8(1), 15–22.
- Khan, R. E. A., Malik Bari, K., & Raza, M. A. (2018). *Socioeconomic Determinants of Child Mortality: Evidence from Pakistan Demographic and Health Survey*. *Business Review*: 13(2):34-50.
- Levy, K., Smith, S. M., & Carlton, E. J. (2019). *Groundwater Sources and Child Health Outcomes in Low-Income Countries*. *Environmental Health Perspectives*, 127(12), 127002.
- Luby, S. P., Kadir, M. A., Sharker, Y., Yeasmin, F., Unicomb, L., & Islam, M. S. (2015). *Recontamination of Drinking Water during Collection and Storage: Evidence from Pakistan and Bangladesh*. *Journal of Water and Health*, 13(1), 1–9.
- Marc, A., & Ali, A. (2016). A causality and co-integration analysis of some selected socio-economic determinants of fertility: Empirics from Tunisia. *Bulletin of Business and Economics (BBE)*, 5(1), 20-36.
- Nakhzari-Moghaddam M, Yavari P, Abadi A, & Rostami-Gooran N. (2019). Association of Socioeconomic Risk Factors with Under 5-Year Mortality in Zabol, Iran, During 2011-2015. *Medical Journal of the Islamic Republic of Iran (MJIRI)*. 33(1):369–74.
- Nolan, L., Bloom, S. S., & O'Donnell, K. (2011). Quality of Health Facilities and Child Mortality in South Asia. *Health Policy and Planning*, 26(4), 321–329.
- Pakistan Bureau of Statistics (PBS). (2019). Pakistan Demographic and Health Survey 2017–18. National Institute of Population Studies (NIPS) and ICF International.
- Rahman, M. M., Alam, K., & Khanam, R. (2022). Socio-Economic Factors Affecting High Infant and Child Mortality Rates in Selected African Countries: Does Globalization Play Any Role? *Globalization and Health*, 18(1), 69.
- Safari H, Nooripour S, Emadi Z, Shakeri R, Jandaghi J, & Mirmohammadkhani M. (2014). Associated Factors Of Mortality Of Children Aged 1 To 59 Months In Rural Areas Of Semnan: A Nested Case-Control Study Based On 10 Years Of Surveillance Data. *Koomesh*. 15(3):282–8.
- Srivastava, S., Upadhyay, S. K., Chauhan, S., & Alagarajan, M. (2021). Preceding Child Survival Status and Its Effect on Infant and Child Mortality in India: Evidence from National Family Health Survey 2015–16. *BMC Public Health*, 21(1), 1577.
- UNICEF. (2020). *The State of The World's Children 2020: Children, Food and Nutrition*. UNICEF.
- Van de Poel, E., O'Donnell, O., & Van Doorslaer, E. (2007). *Are Urban–Rural Inequalities In Child Mortality Decreasing? Evidence from Developing Countries*. *Health Economics*, 16(11), 1109–1126.



Advance Journal of Econometrics and Finance

Vol-4, Issue-1, 2026

- Wahl, B., Nama, N., Pandey, R. R., Garg, T., Mishra, A. M., Srivastava, S., & Kishore, S. (2023). Neonatal, Infant, And Child Mortality in India: Progress and Future Directions. *Indian Journal of Pediatrics*, 90(1), 1-9.
- World Bank. (2018). Pakistan Health Sector Review: Improving Survival Outcomes. World Bank Publications
- World Health Organization (WHO) & UNICEF. (2021). *Progress on Household Drinking Water, Sanitation and Hygiene: 2000–2020*. WHO/UNICEF Joint Monitoring Programme (JMP).
- Yusuf, A., Ahmad, T., & Rehman, S. (2020). *Household and Environmental Determinants of Child Health and Mortality in Developing Countries*. *Journal of Public Health and Development*, 18(2), 112–125.
- Yusuf, A., Arif, G. M., & Farooq, S. (2020). Socioeconomic Determinants of Child Health in Developing Countries. *International Journal of Public Health*.
- Yusuf, S., Jadoon, A., & Khan, M. (2020). Environmental and Household Factors Affecting Child Health Outcomes in Pakistan. *Pakistan Journal of Public Health*, 10(2), 85–92.