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ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) TOWARDS CHILD MORTALITY IN PAKISTAN

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Abstract

Over time, child mortality is decreasing, while the use of ICT is increasing in Pakistan. This study examines the role of ICT in child mortality in Pakistan using the Pakistan Social and Living Standard Measurement Survey for 2018-19. Due to the binary nature of the dependent variable, this study uses a logit model. The results show that there are fewer chances of child mortality in households that have access to ICT as compared to those households that don't have access. If households use ICT, then there are 0.61 times fewer chances of child mortality compared to those who do not use and these results are statistically significant. This study also uses some control variables. These variables are income, education, household size, and age. As income, education, and age of the household head increase, there are fewer chances of child mortality. Further, as household size increases, there are more chances of child mortality. The effect of access to ICT on child mortality is greater in urban areas as compared to rural areas. The policy implication is that the government should lay out such policies that households can have access to ICT easily, especially in rural areas. Further, policies focusing on growth, education, and age maximization, as well as policies focusing on minimizing household size, should be adopted.

1. INTRODUCTION

Child mortality is defined as the possibility of a child dying between birth and their fifth birthday that is expressed as the number of deaths per 1,000 live births. Child mortality rate is one of the best indices of child health and shows social and economic development in low- and middle-income countries (LMICs). It is an important measure of a population's general health and well-being, as well as the efficiency of health care systems and socioeconomic circumstances (Adedini *et al.*, 2024; Rezayat *et al.*, 2019; World Health Organization, 2023). Because it is a reflection of systemic disparities in healthcare access, living conditions, and social determinants of health, child mortality is one of the most critical worldwide health and development issues. Systemic deficiencies in healthcare, nutrition, sanitation, and general

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living circumstances are evident in high child death rates. The first 28 days of a child's life are the riskiest, and neonatal mortality makes up over 45% of deaths in children under five. Neonatal infections, difficulties in delivery, and premature birth are among the causes of child mortality (Dutta *et al.*, 2020; WHO, 2022).

Child mortality is a key indicator of global health disparities and development issues before the Millennium Development Goals (MDGs)' establishment in 2000. Its consistently high levels, especially in low- and middle-income nations, brought attention to structural problems with healthcare access and social determinants of health. Child mortality rates in low- and middle-income nations were much higher in 1980. In 1980, the under-5 mortality rate was at 122 deaths for every 1,000 live births worldwide. This indicates that around one out of every eight kids did not make it to their fifth birthday. A significant amount of infant mortality was caused by neonatal deaths, or deaths that occurred during the first 28 days of life. According to the World Health Organization (1986), there were almost 45 newborn fatalities for every 1,000 live births worldwide. UN Member States committed to attempting to accomplish the eight Millennium Development Goals (MDGs) by 2015. MDG 4 was to cut the number of deaths in children under five by two-thirds between 1990 and 2015. The number of children under five who died worldwide decreased from 12.7 million in 1990 to 6.3 million in 2013. Compared to 12.7 million in 1990, 6.3 million children under the age of five died in 2013. Under-5 mortality decreased from 91 deaths per 1000 live births in 1990 to 43 in 2015. So, the MDG target of a two-thirds reduction in 1990 mortality levels by 2015 is unlikely to be met globally, notwithstanding this improvement (Millennium Development Goal, 2018). As a result, new developmental targets known as the Sustainable Development Goals (SDGs) were established. These goals declare that nations are committed to reducing their U5MR to 25 or fewer fatalities per 1000 live births by 2030. The goal of these new tactics was to eradicate avoidable infant and child mortality (UNICEF, 2000; Rezayat *et al.*, 2019; You *et al.*, 2015).

All 191 UN Member States have committed to attempting to accomplish the 17 goals and 169 targets in 2015, known as the Sustainable Development Goals (SDGs), by 2030. The third goal, SDG-3, focuses on promoting healthy lives and well-being for all children. Target 3.2.1 calls for eliminating infant and young child deaths that can be prevented and reducing the child mortality rate to 25 per 1000 live births by 2030 (United Nations, 2015). The under-5 death rate decreased by 60% between 1990 and 2020 (UNICEF, 2021). This indicated significant progress in improving the chances of survival for young children. So, we are still far from reaching the second SDG-3 target (Kein & Nguyen, 2024).

There are some studies that have explored the factors affecting child mortality. Infections such as pneumonia, diarrhea, and malaria are leading causes of death in children (Tharwani *et al.*, 2023). The health of the mother is crucial to the health of the child. Poor maternal nutrition, lack of prenatal care, and complications during pregnancy or childbirth can lead to high risks for infant mortality (Kross.G et al.,2019). In many regions, particularly in sub-Saharan Africa and parts of South Asia, there is insufficient access to essential healthcare services, including skilled healthcare workers, inadequate facilities, and limited access to vaccines and medicines (UNICEF,2023). Institutional and cultural barriers prevent women from accessing education, resulting in child mortality (Kiross *et al.*, 2019). There are inverse relationships between child mortality and the number of doctors, globalization, and economic development (Rahman *et al.*, 2022). The mortality rate is reduced when families are well-educated and financially stable. The three main biological factors influencing the childhood mortality rate are mother's age, place of birth,

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and breastfeeding (Hussain *et al.*,2023). According to Panda & Sarangi (2023), the use of polluting cooking fuel and inadequate sanitation facilities increase the risk of death for children under five.

Another variable affecting child mortality may be information and communication technology (ICT). Computers, mobile phones, the internet, and other digital technologies are examples of ICT (Wakefield *et al.*, 2010). ICT has the potential to significantly improve healthcare and health in impoverished nations. ICT increases the general public's access to health information, which has always been made feasible by communication media (Lucas, 2008). The efficiency of health services could be significantly increased by using information and communications technology (ICT) to assist health and health-related fields, such as health care services, health publications, and health education, knowledge, and research. Multiple healthcare facilities can offer health care services using information technologies, including electronic health records (EHRs), mobile phones, and handheld computers, or m-health. They can assist a medical professional in carrying out clinical responsibilities. According to patients, using Internet-based health information improves their comprehension and capacity to control their medical conditions (Blaya *et al.*, 2010).

Mobile technology is being used more and more to prevent illness and enhance wellness. Innovations in mobile health have been developed to address a variety of issues, including enhancing the speed, accuracy, and convenience of diagnostic tests; tracking chronic conditions, medication adherence, scheduling appointments, and delivering medical test results; and enhancing communication between patients and providers, health information, data collection, tracking of diseases and emergencies, and access to medical records (Lewis & Kershaw, 2010). They discovered substantial effects on diabetes control and weight loss when using mobile text messaging as a tool to modify people's behavior toward sickness prevention and disease management. Their findings suggested that text messaging might be useful for real-world illness prevention and management (Lewis & Kershaw, 2010). The ability to create and modify ICT solutions for all aspects of society, including healthcare, is made possible by the availability of multiple multimedia interfaces (Haluza & Jungwirth, 2014).

The information provided through television shows that focus on health and illness is very useful and affects child mortality. In order to educate and raise viewers' knowledge of health issues, television serves as a medium for reporting on health and illness, identifying possible dangers, and describing current trends and opportunities. The most popular way to find health information is through television news programs. Television is a useful tool for spreading health information and ought to collaborate with all health-related organizations (Burzyńska *et al.*, 2015). Health and well-being have the potential to deliver incredible benefits across the whole of the global healthcare ecosystem (Cullen, 2017), and ICTs are essential to reaching the UN Sustainable Development Goal 3. People now have access to a wealth of health-related information due to the development of ICT and the internet. In addition to helping patients make better health decisions, this accessibility has enhanced interactions and services connected to healthcare and increased the efficacy and efficiency of patient-physician communication (Khelfaoui *et al.*, 2022).

Developments in e-health information technology for patient care management. They demonstrated how e-health significantly improved health in underdeveloped nations. ICT improved communication between institutions and helped with medication distribution and organization. Through treatment support, patient monitoring, handling supplies, health funding, and emergency services, ICT in health through mhealth (mobile health) improves access to and quality of

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healthcare (Magbowon & David, 2023). Every year, more than 4.5 million women and infants pass away during pregnancy, childbirth, or the initial weeks following delivery. The majority of these avoidable fatalities occur in low- and middle-income nations (LMICs). The use of ICT, digital connectivity, and mobile health technologies (mHealth) can prevent acute and chronic diseases, enhance healthcare quality and coverage, and provide access to health information. ICT is essential to economic growth and sustainable development since it lowers healthcare costs, improves service accessibility, and promotes technological improvement (WHO, 2021). Digital health platforms and telemedicine link rural households with qualified nurses and doctors. Medical consistency is supported by electronic medical records. Mortality is decreased by treating diarrhea, pneumonia, and newborn infections as soon as possible (Bossman *et al.*, 2022).

Internet users had a higher likelihood of using prenatal care and child vaccination services. It is well recognized that these interventions provide protection against baby and under-five mortality (Adedokun *et al.*, 2017). Access to ICT through social media, mobile devices, and internet platforms spreads important details regarding antenatal care (ANC), vaccination regimens, breastfeeding, hygiene, and warning signs throughout pregnancy and early childhood (Kazi *et al.*, 2021). ICT fills these gaps by giving women access to information and services, particularly through telemedicine, SMS, and mobile health (mhealth) apps. To lower child mortality, for instance, telemedicine systems allow for prenatal and postnatal visits and monitoring (Girmay, 2024). Digital reminders made possible by ICT guarantee that infants receive their vaccinations on schedule, which is essential for avoiding child mortality (Lee *et al.*, 2015). Access to ICT (internet, mobile banking, e-learning) improves parental economic and educational chances, which are important factors in determining a child's survival (Hobcraft *et al.*, 1985).

Some studies identified the relationship between ICT and child mortality at the global level (Majeed & Khan,2019; Khelfaou *et al.*, 2022; Shao *et al.*, 2022; Kouton *et al.*, 2021; Kubo *et al.*, 2022). As far as Pakistan is concerned, Numerous studies have assessed a variety of factors affecting child mortality, but the role of ICT in affecting child mortality is neglected in Pakistan. The aim of this study is to fill this gap by investigating the impact of ICT on child mortality in Pakistan.

1.1 Scheme of the Study

After introduction the second section of the study show the theoretical framework, the third section define the data and methodology. Fourth section explain the result and discussion, in the last section policy recommendations are discuss.

2. Theoretical Framework

Information and communication technology (ICT) is crucial to improving global health systems. A lot of possibilities are available for technology to improve healthcare and other health outcomes. Learning about telemedicine and mhealth is beneficial for healthcare professionals (Majeed & Khan, 2018). According to Aly & Grabowski 1990), women who have completed more schooling are more educated about the healthcare system and are better able to locate health services. Additionally, education can help reduce negative attitudes about disease by promoting modern childcare procedures and preventative measures and reducing reliance on traditional childcare practices (Caldwell, 1979). According to (Barrera, 1990), it indicates that mothers may have a higher chance of having healthy children, which will ultimately result in a drop in child mortality. Through better access to health information and increased knowledge of childcare health, ICT can have an impact on children's lives. According to Wakefield *et al.*

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2010), ICT includes mobile phones, the internet, health applications, and telemedicine. These technologies offer knowledge about good eating that is essential for both mother and child health, and that has a significant influence in lowering child mortality. Prenatal care is increased by mobile interventions like SMS reminders, which lower child mortality (Lee *et al.,* 2016). Parents receive timely updates on vaccinations, treatments, and immunizations using ICT, which will ultimately assist ensure the lives of their children (Donner, 2008; UNICEF, 2020).

ICT has transformed healthcare by boosting economic development, productivity, availability, and transformation. ICT is essential for sustainable development and economic progress since it increases access to services, reduces healthcare costs, and fosters technological developments (WHO, 2021). Patients can feel more empowered and in charge of their disease by using web health information to increase their knowledge and self-awareness, which will help them make better decisions to improve their quality of life (WHO, 2022; Lucas, 2008).

Now it is possible to understand the contribution of information and communication technology (ICT) to the reduction of child mortality in Pakistan by using a number of interconnected theoretical frameworks. First, the Diffusion of Innovations hypothesis developed by Rogers (2003) describes how telemedicine platforms, SMS reminders, and cell phones function as health innovations that propagate across social networks, impacting maternal behavior and child health outcomes. In the same way, Andersen's Health Services Behavioral Model Utilizing ICT gives caregivers access to timely health information and medical guidance, positioning it as both a contributing and facilitating element (Andersen, 1995). These concepts are supported by empirical data from Pakistan. Research indicates that, especially in urban areas, households with access to a mobile phone use maternal and child health services more frequently (Asif *et al.,* 2022). The fact that mhealth treatments greatly increase vaccination coverage and antenatal care attendance in low- and middle-income nations is also supported by systematic reviews (Bossman *et al.,* 2022; Knop *et al.,* 2024). Socioeconomic circumstances, however, minimize these effects because the successful implementation of ICT-based initiatives is dependent on maternal education, household wealth, and infrastructure preparedness, including cell coverage and electrical dependability (UNICEF, 2024). According to the United Nations 2011), ICT infrastructure increases income levels and employs qualified workers, which influences GDP, job creation, profitability, and improves the rate of return. Overall, information and communications technology (ICT) plays a major role in improving health systems of the world. Diffusion of Innovations hypothesis developed by Rogers (2003) describes how telemedicine platforms, SMS reminders, and cell phones function as health innovations that impact maternal behavior and child health outcomes. ICT contributes to economic growth by increasing productivity and employment. Economic theory explain higher income improves living conditions and access to healthcare that ultimately reduces child mortality.

ICT investment → Economic growth → Higher income → Better child health → Lower mortality.

3. Data and Methodology

3.1 Data

To determine the impact of Information and communication technology on child mortality, this study uses the Pakistan Social and Living Standard Measurement (PSLM) surveys for the year 2018-19.

3.2. Methodology

To find out the effect of information and communication technology, the following model is estimated:

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$$Prob(CM_i = 1) = \alpha + \beta ICT_i + e_i \quad (1)$$

Where CM is Child mortality, ICT is information and communication technology, and e is the error term

Hypothesis testing

$H_0 : \beta = 0$ (There is no relationship between ICT and Child Mortality)

$H_1 : \beta \neq 0$ (There is some relationship between ICT and Child Mortality)

After having estimated the key model, the study also includes some control variables. The study estimates the following model

$$Prob(CM_i = 1) = \alpha + \beta_1 ICT_i + \beta_2 INC_i + \beta_3 EDUHH_i + \beta_4 HHS_i + \beta_5 AGHH_i + e_i \quad (2)$$

Whereas:
CM = Child Mortality
ICT= Information and Communication Technology
INC= Income
HHS= Household Size
AGHH= Age of Household head
EDUCHH= Education of Household head
μ = Error Term
i represents the cross-sectional unit.
$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ are the slope coefficients of ICT, INC, HHS, AGHH, and EDUCHH, respectively.

Hypotheses testing

$H_0 : \beta_1 = 0$ (There is no relationship between child mortality and ICT)

$H_1 : \beta_1 \neq 0$ (There is *some* relationship between child mortality and ICT)

$H_0 : \beta_2 = 0$ (There is no relationship between child mortality and INC)

$H_1 : \beta_2 \neq 0$ (There is *some* relationship between child mortality and INC)

$H_0 : \beta_3 = 0$ (There is no relationship between *CM* and EDUHH)

$H_1 : \beta_3 =$ (There *is some relationship between CMand EDUHH*)

$H_0 : \beta_4 = 0$ (There is no relationship between *CM* and HHS)

$H_1 : \beta_4 =$ (There *is some relationship between CMand HHS*)

$H_0 : \beta_5 = 0$ (There is no relationship between *CM* and AGEHH)

$H_1 : \beta_5 =$ (There *is some relationship between CMand AGEHH*)

Why we use a logit model:
We use a logit model because our dependent variable is binary, or in the form of 0 and 1. Logit models are used for estimating consistent results, and marginal effects are also calculated. The average marginal effect is given as the effect on probability, and these numbers lie between 0 and 1. All other variables constant, it represents the average change in probability when x rises by one unit. Logit is a non-linear model; the effect will vary from individual to individual.
Comparative analysis of logit, Probit and Tobit model for justification:

Normally, logit and probit models are the same, but the difference is in the distribution. In the logit model, the cumulative standard logistic distribution (F) is used, whereas in the probit model, the cumulative standard normal

distribution (Φ) is used, but both models provide similar results.
The Tobit model is also known as the censored regression model. When the dependent variable is censored, least Squares Estimates give biased results. Therefore, when censoring is applied to the dependent variable, the Tobit model allows us to derive consistent and asymptotically

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efficient predictors. Tobit model is known as a model where the dependent variable has a lower or upper limit.

4. Results and Discussions

Access to ICT is crucial for developing as well as developed countries. The latest technology that is influencing the economy and society at large is the internet (Shujaat, 2024). The most common method to access the internet in Pakistan is through mobile phones, and the cellular sector created over half a million jobs and contributed $3.3 billion to public sector revenue in 2019–20. In Pakistan, the mobile ecosystem contributes $16.7 billion to the economy, or 5.4% of GDP (Farooq, 2024). The internet has a favorable and large impact on household income (Chang & Lambert, 2018). With the use of ICT and rapidly increasing digital connectivity, mobile health technologies (mHealth) can prevent acute and chronic diseases, enhance healthcare quality and coverage, and provide access to health information. ICT is essential to economic growth and sustainable development since it lowers healthcare costs, improves service accessibility, and promotes technological improvement (WHO, 2022). Prenatal care and childhood vaccinations were commonly used by women who accessed the internet. Infant and under-five mortality is known to be prevented by these services (Adedokun *et al.*, 2017). Now we present the results of descriptive statistics in Table 4.1.

Table 4.1. Descriptive Statistics

Variable	Mean	Std Dev.	Min	Max
Child Mortality	0.17	0.37	0	1
Access to ICT	0.23	0.42	0	1
Income	6334	4298	1302	171258
Educ HH	4.99	5.14	0	18
HH Size	6.44	3.22	1	55
Age HH	45.84	13.6	16	99

Note. Authors own calculations

Table 4.1. shows the descriptive statistics of the above-mentioned variables. Child mortality is a dummy variable. There are 17% of households where at least one child died in Pakistan. Access to ICT is also a dummy variable. There are 23% of households who are having access to ICT at the Pakistan level. When there is access to ICT, then 1; otherwise, 0. The average household size is 6. The average value of income is Rs.6334 per month. The minimum income of the people is Rs. 1302, and the maximum income is Rs.171258 per month. Mean education attained is 4.99 classes. Minimum education attained is 0 (meaning never attended school), and the maximum education is 18 classes. The average household size is 6.44. The minimum is 1, and the maximum is 55. The average age of households is 45 years. The minimum is 16 years, and the maximum is 99 years. Now we show the effects of ICT on child mortality in Pakistan.

Table 4.2. Role of ICT towards Child Mortality in Pakistan

Variable	Coefficient	S. E	Z-Value	OR	AME
Access to ICT	-0.48	0.04	-10.96***	0.61	-0.06
Constant	-1.47	0.01	-79.40***	0.22	
No of observation	24,809				

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LR ch2 (1)	129.67				
Prob>ch2	0.0000				
Pseudo R^2	0.0057				

Note: OR shows odds ratios
***level of significance at 0.01

Table 4.2. displays that there is a statistically significant negative relationship between child mortality and access to ICT. The results show that there are fewer chances of child mortality in those household who have access to ICT as compared to households that do not use it. These results are statistically significant at the 1% level. The study also estimates the average marginal effects. It shows that when there is a one-unit increase in access to ICT, there will be a 0.06 percent lower chance of child mortality in Pakistan as compared to household those do not use it. The odds ratio of the ICT variable indicates that if a household has access to ICT, then there aare 0.61 times fewer chances of child mortality than those household who have no internet. The results may be justified as follows. ICT includes mobile phones, the internet, health applications, and telemedicine. These technologies offer knowledge about good eating that is essential for both mother and child health (Wakefield *et al.*, 2010). Prenatal care is increased by mobile interventions like SMS reminders (Lee *et al.*, 2016). Parents receive timely updates on vaccinations, treatments, and immunizations using ICT (Donner, 2008; UNICEF, 2020). Access to ICT improves the effectiveness and efficiency of patients when communicating with their physicians, assists them in their health decisions, and improves healthcare-related interactions and services (Khelfaoui et. al., 2022). ICT is beneficial for the health of mothers who use the internet, television, and radio during their pregnancy, that ultimate helpful for their children (Oluwaseun *et al.*, 2019). So, our results are consistent with those of Donner, (2008), Wakefield *et al.*, (2010), Lee *et al.*, (2016), Oluwaseun *et al.*, (2019), Shahzad & Mujtaba, (2020), UNICEF, (2020), Zaeem *et al.*, (2021), Khelfaoui et. al, (2022).

The study also uses some control variables to check their impact on the dependent variable. These variables are income, Household size, Age of the household head, and education level of the household head. The results are presented in Table 4.3.

Table 4.3. Role of ICT towards Child Mortality including some control variables in Pakistan

Variable	Coefficient	S. E	Z-Value	OR	AME
Access to ICT	-0.22	0.04	-4.77***	0.79	-0.03
Income	-0.03	0.00	-7.30***	0.97	-0.00
Educ HH	-0.03	0.00	-8.16***	0.97	-0.00
HH Size	0.08	0.00	14.84***	1.08	0.01
Age HH	-0.01	0.00	-10.54***	0.99	-0.00
Constant	-0.94	0.08	-12.12***	0.39	
No of observation	24,809				
LR ch2 (1)	758.97				
Prob>ch2	0.0000				
Pseudo R^2	0.0334				

Note. Authors' own calculation, *** the level of significance at 0.01

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Table 4.3. displays that there is a statistically significant negative relationship between child mortality and ICT. It shows the same results when we used control variables. The sign of the coefficient of income of household indicate that

child mortality is negatively related to income. These results are statistically significant at the 1% level. The odds ratio reveals that if there is a one-unit increase in income, there is 0.97 times the chance of child mortality. These results may be possible because a wealthy household have lowers chance of child death because they have more income to spend on health-related issues and health expenditure. These results are consistent with the following studies (Ethan Yeh *et al.,* 2004; Edeme *et al.,* 2014; Backlund *et al.*, 2019; Ekholuenetale *et al.,* 2020; Tharwani *et al.,* 2023).

The coefficient of education of the household head is negative, indicating an inverse relationship between the education of the household head and child mortality. This implies that an increase in the educational level of the household head is associated with a reduction in the probability of child mortality. The result is statistically significant at the 1% level. A possible explanation is that educated household heads have better knowledge and understanding of child nutrition, immunization, disease prevention, and the importance of seeking timely medical treatment. Education may also improve the ability of household members to utilize health-related information through ICT, mobile phones, and the internet. Higher education of the household head may improve health awareness, household decision-making, and the use of modern health information. These results are consistent with those of Rehman et al. (2022), Asif et al. (2022), and Kiani (1992).

The sign of the coefficient of household size indicates that the impact of household size on child mortality is positive or direct, and it is statistically significant. If the number of household member increases, there are more chances of child mortality. The logic behind this is that large household size typically has lower resources per person, which has a negative influence on the health and survival of children. There may be less support and a greater chance of death in large households. These results are consistent with those of Edeme *et al.* (2014) and Ekholuenetale *et al.* (2020). When there is a one-unit increase in household size, there will be 0.01 percent more chances of child mortality rate in Pakistan. Household size has a significant effect on child mortality rate in Nigeria (Ekholuenetale *et al.,* 2020),

The coefficient of the age of the household head is negative and statistically significant at the 1% level. This finding explains that children living in households headed by relatively older individuals may have better survival prospects than those living in households headed by younger individuals. Older household heads may possess greater practical experience and accumulated knowledge regarding childcare, childhood illnesses, nutrition, hygiene, and healthcare utilization. With increasing age, household heads may have experienced different childhood health problems and therefore become more familiar with appropriate preventive and curative healthcare practices. This experience may help them make better decisions regarding health and child survival. Older household heads with greater household and childcare experience may be better positioned to recognize health risks and make decisions about seeking healthcare, while access to ICT can provide them with additional information about child health, immunization, nutrition, and disease prevention. Thus, household-head age may complement the effect of ICT by influencing how health information is understood and acted upon. The role of age can partly reflect the accumulated experience and knowledge that parents or household heads acquire over time. These outcomes are consistent with those of Friede *et al.* (1988), Mahmood and Kiani (1994), Fayehun et al. (2010), and Gupta et al. (2016).

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Regional level

To check the role of ICT towards infant mortality in urban-rural areas, the same variable is used at the Pakistan level. Urban-rural areas of Pakistan have diverse economic and social features, and so households in these areas have different prospects of child mortality. The study also estimates the causes of child mortality at the district level in Pakistan. The results are given in Table 4.4. Results at the urban-rural levels are also significant and stable at the Pakistan level.

Table 4.4 Role of ICT towards Child Mortality in urban/rural regions in Pakistan

	Urban areas				Rural areas			
Variable	**Coeff**	***z*-value**	**OR**	**AME**	**Coeff**	***z*-value**	**OR**	**AME**
Access to ICT	-0.54 (-0.06)	-8.19***	0.74	-0.06	-0.31 (-0.05)	-5.36***	0.55	-0.04
Constant	-1.63 (-0.03)	-45.97***	0.19		-1.41 (-0.02)	-64.68***	0.24	
No of observation	8873				15936			
LR ch2 (1)	71.89				30.25			
Prob>ch2	0				0			
Pseudo R2	0.0099				0.002			

Table 4.4 shows that in urban areas, if households have access to ICT, then their children have 0.74 times less chance of child mortality than those who have no access to ICT, while 0.55 times less chances of child mortality whose households have access to ICT as compare to those who have no access to ICT in rural areas of Pakistan. These results are statistically significant at the 1%. Result shows that role of ICT towards child mortality is more in urban region as compared to rural region (Girmay,2024; Adedokun *et al.*, 2017; Ekholuenetale *et al.*, 2020). These results are consistent with those of Khelfaoui et. al. (2022).

5. Conclusion and Policy Recommendations

Conclusion

This study examines the role of information and communication technology (ICT) towards child mortality in Pakistan. In this research, the data are taken from the PSLM survey from the time period 2018-19. Due to the binary nature of the dependent variable, the study uses a logit model to estimate the results. Result shows that there is an inverse relationship between ICT and child mortality in Pakistan. With the use of ICT and rapidly increasing digital connectivity, mobile health technologies (mhealth) can prevent acute and chronic diseases, enhance healthcare quality and coverage, and provide access to health information. We also found that there is more access to ICT in urban Pakistan as compared to rural Pakistan, and Urban Pakistan uses ICT more frequently for health-related issues, which shows that the child Mortality rate is low in urban Pakistan as compared to rural Pakistan. The policy implications are that the government should lay out such policies that Households can have easy access to ICT, especially in rural areas; economic growth can be maximized; and households have smaller household sizes, more education, and longer life.

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