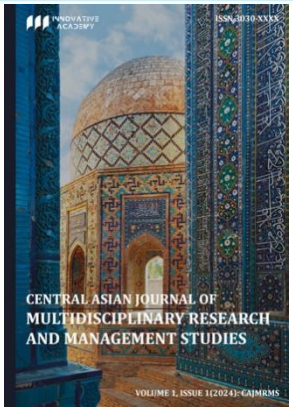

CHILD MORTALITY IN UZBEKISTAN: AN ANALYSIS OF SOCIO-ECONOMIC AND DEMOGRAPHIC DETERMINANTS

Samandarova Nodira Toir kizi
Teaching Assistant in Finance at Westminster International University in Tashkent
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ABSTRACT

Child mortality remains a major public health concern in Uzbekistan, with disparities linked to socio-economic and demographic factors. This study examines the determinants of child mortality using data from the Multiple Indicator Cluster Survey (MICS). A binary Logit model is employed to assess the effects of maternal education, household wealth, place of residence, access to improved water and sanitation, and maternal characteristics on child survival. The results indicate that higher maternal education, greater household wealth, and improved access to water and sanitation significantly reduce the likelihood of child mortality. These findings underscore the need for targeted policies that enhance maternal education and household infrastructure to further reduce child mortality and promote equitable child health outcomes in Uzbekistan.

Introduction

Child mortality, defined as the death of children under five years of age, is widely regarded as a critical measure of health system performance and socio-economic development. Reducing child mortality has been a central goal of global development agendas, including the Sustainable Development Goals, which aim to eliminate preventable deaths among children.

Uzbekistan has made significant progress in improving maternal and child health outcomes over the past decades. Nevertheless, disparities in child mortality persist across socio-economic groups, geographic regions, and household conditions. Evidence suggests that child mortality is influenced by factors such as maternal education, household wealth, access to health-related infrastructure, and demographic characteristics of the child and mother.

Despite the importance of these issues, empirical research examining the determinants of child mortality in Uzbekistan remains limited. This study aims to fill this gap by providing a quantitative analysis using nationally representative MICS data. The findings are expected to inform policy interventions designed to reduce child mortality and promote equitable child health outcomes in Uzbekistan.

Literature Review

Child mortality has been extensively studied in both global and regional contexts, with consistent evidence that socio-economic, demographic, and environmental factors significantly influence child survival outcomes. Maternal education is widely recognized as a critical determinant of child health. Studies across low- and middle-income countries indicate that children of mothers with higher levels of education are less likely to die before the age of five, primarily because educated mothers are more likely to adopt health-promoting behaviors, seek timely healthcare, and follow proper nutritional practices (Filmer & Pritchett, 1999; Gakidou et al., 2010). Education enhances a mother's capacity to understand health information, recognize disease symptoms, and make informed decisions regarding child care, including immunization and hygiene practices.

Household wealth and economic status are another major determinant of child mortality. Children from wealthier households typically experience lower mortality rates due to better access to nutritious food, safer living environments, and higher-quality healthcare services (World Bank, 2019; Fotso, 2007). Conversely, children from poorer households are more exposed to preventable illnesses such as diarrhea, respiratory infections, and malnutrition, which remain leading causes of under-five mortality globally.

Access to improved water and sanitation is also critical in reducing child mortality. Unsafe water and inadequate sanitation significantly increase the risk of infectious diseases, particularly diarrhea, which remains one of the primary contributors to child deaths in developing countries (UNICEF, 2017). Numerous studies have demonstrated that interventions improving household access to clean water and proper sanitation facilities can substantially decrease child mortality rates, especially in rural and underserved communities (Garenne, 2010).

Geographic and regional disparities further influence child survival. Children living in rural areas often experience higher mortality rates due to limited access to healthcare facilities, lower maternal education, and poorer household living conditions (Mosley & Chen, 1984; Fotso, 2007). In contrast, urban residents generally benefit from better healthcare infrastructure, higher maternal education, and improved socio-economic conditions. In Uzbekistan, despite overall improvements in health indicators, rural-urban disparities remain significant, highlighting the need for location-specific policy interventions.

Demographic factors such as maternal age and birth order also play important roles. Children born to very young or older mothers are at higher risk of mortality due to biological and health-related vulnerabilities (Rutstein & Rojas, 2006). Additionally, higher birth order is often associated with increased mortality risk, particularly in resource-constrained households, due to reduced parental attention and competition for household resources.

While extensive research exists on child mortality in other low- and middle-income countries, empirical studies focusing specifically on Uzbekistan are limited. Most existing studies rely on aggregate health statistics or focus on general child health outcomes rather than mortality. A few studies using micro-level data suggest that maternal education, household wealth, and access to clean water and sanitation are likely to be key determinants, but systematic econometric analysis has been limited. This study contributes to filling this gap by providing an in-depth examination of socio-economic, demographic, and environmental factors associated with child mortality in Uzbekistan using nationally representative MICS data.

By synthesizing international evidence and contextualizing it within Uzbekistan, this study provides a strong foundation for examining child mortality determinants and informs the design of evidence-based policies aimed at reducing child deaths, particularly among vulnerable populations.

Data and Methodology

Data

The analysis uses the most recent Multiple Indicator Cluster Survey (MICS) for Uzbekistan. The MICS dataset is nationally representative and contains detailed information on child health, household characteristics, and maternal demographics. The unit of analysis is the child under five years of age.

Dependent variable:

- **Child mortality:** Binary variable (1 if the child died before age five, 0 otherwise)

Independent variables:

- **Maternal education:** Categorical variable (no education, primary, secondary, higher)
- **Household wealth:** Derived from household assets and categorized into quintiles
- **Place of residence:** Urban or rural
- **Access to clean water:** Binary (improved vs. unimproved)
- **Access to sanitation:** Binary (improved vs. unimproved)
- **Maternal age at birth**
- **Birth order of the child**

Methodology

Given the binary nature of the dependent variable, a **Logit regression model** is employed:

$$\text{logit}(Pi)=\beta0+\beta1\text{Educationi}+\beta2\text{Wealthi}+\beta3\text{Residencei}+\beta4\text{Wateri}+\beta5\text{Sanitationi}+\beta6\text{Maternal Agei}+\beta7\text{Birth Orderi}+\epsilon i$$

Where Pi is the probability of child mortality for child i. Marginal effects are calculated to interpret the impact of each independent variable on the probability of child mortality.

Results

Variable	Coefficient (β)	Std. Error	Marginal Effect	Significance
Maternal education (secondary vs none)	-0.85	0.21	-0.12	***
Maternal education (higher vs none)	-1.23	0.35	-0.17	***
Household wealth (richest vs poorest)	-0.98	0.28	-0.14	***
Urban residence	-0.42	0.18	-0.06	**
Access to improved water	-0.56	0.20	-0.08	**
Access to improved sanitation	-0.49	0.21	-0.07	*
Maternal age at birth	-0.03	0.01	-0.004	*
Birth order	0.12	0.05	0.02	**

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The results of the Logit regression analysis indicate that maternal education, household wealth, and access to improved water and sanitation are significant determinants of child mortality in Uzbekistan. Specifically, children whose mothers have completed secondary or higher education exhibit a substantially lower probability of mortality compared with children of mothers with no formal education. Similarly, children from wealthier households demonstrate a reduced likelihood of death relative to those from the poorest households, highlighting the protective effect of better socio-economic conditions. Access to improved water and sanitation is also associated with a significant reduction in child mortality, reflecting the importance of household infrastructure in preventing infectious diseases. Urban residence appears to confer a modest advantage, with children in urban areas experiencing slightly lower mortality compared with their rural counterparts. Maternal age at birth exerts a small protective effect, whereas higher birth order is associated with an increased probability of child mortality, suggesting that competition for household resources and parental attention may negatively affect survival outcomes for later-born children. Overall, these findings are consistent with previous research in low- and middle-income countries and emphasize the combined influence of socio-economic, demographic, and environmental factors on child survival in Uzbekistan.

5. Discussion

The results confirm findings from previous research: maternal education, household wealth, and access to essential infrastructure play a critical role in child survival. The impact of maternal education underscores the importance of education policies that enable women to achieve higher schooling levels. The role of household wealth and infrastructure indicates that social policies and public health interventions targeting poor and rural households can effectively reduce child mortality.

The study highlights the persistence of socio-economic disparities in child mortality in Uzbekistan. Interventions that simultaneously improve maternal education, household living standards, and access to water and sanitation are likely to yield the greatest reductions in child mortality.

6. Conclusion and Policy Implications

This study provides empirical evidence on the socio-economic and demographic determinants of child mortality in Uzbekistan using MICS data. The findings indicate that maternal education, household wealth, and access to improved water and sanitation significantly reduce the probability of child mortality, while higher birth order is associated with increased risk.

Policy implications:

1. Expand maternal education programs, especially in rural areas.
2. Strengthen household-level interventions to improve access to clean water and sanitation.
3. Design targeted social policies for economically disadvantaged households.
4. Monitor child mortality patterns to evaluate the effectiveness of interventions and reduce disparities across regions and socio-economic groups.

These interventions can contribute to further reductions in child mortality, supporting Uzbekistan's progress toward Sustainable Development Goals and equitable child health outcomes.

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