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# Blood Pressure, Urine and Blood Test Barriers During Antenatal Care in Bangladesh: an Analysis Of MICS 6

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**Abstract:** Antenatal care is important during the pregnancy. During that, pregnant women will be tested for blood pressure, urine, and blood test as the essential information for mother and baby. This study purposed to examine the factors impact to inaccessibility of blood pressure, urine, and blood test. This study used the secondary data using "Multiple Indicators Clusters Survey" round 6 in 2019. Total sample of this study are 7,607 women who experienced antenatal care services. The data analysis was done for univariate, bivariate, and multivariate using binary logistic regression. The results in this study revealed that educational level and wealth index as the main predictors of inaccessible tests during antenatal care. Increasing level of education and wealth index will decrease the barriers to access testes. Government and stakeholders can focus on education and economics sectors to increase the accessibility to antenatal care especially for blood pressure, urine, and blood test services.

**Keywords:** Antenatal Care; Bangladesh; Blood; Blood Pressure; Urine.

## Introduction

During antenatal care in developing countries, blood tests, urine tests, and blood pressure measurements play an important role in monitoring the health of the mother and fetus. However, studies show that these tests and screenings are not regularly performed according to WHO guidelines. In Bangladesh, a developing country in South Asia, only a small proportion of women received the recommended number of antenatal care visits and essential components of care. Blood tests, urine tests, and blood pressure monitoring were not routinely conducted for all women (Islam & Masud, 2018). In six sub-Saharan African countries, only 39% of antenatal care clients were asked about preeclampsia and eclampsia danger signs, and only 68% had their blood pressure measured correctly (Rawlins et al., 2018). This indicates that essential screening and monitoring tests are often not adequately provided during antenatal care in these low-resource settings. Inadequate testing and screening during antenatal care in developing countries can lead to missed opportunities for early detection and management of potential complications, impacting the health of both the mother and baby. Improving the quality and coverage of these essential components of care should be a priority to reduce maternal and neonatal morbidity and mortality.

Based on the available references, a study provides insights into the education and income correlated with antenatal care (ANC) in Bangladesh (Ali et al., 2018). A separate study discovered that women who gave birth

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at home, women belonging to the lowest wealth quintile, and women who did not receive any prenatal care (ANC) were the least inclined to receive postnatal care (Aziz et al., 2022). Another study shown a substantial and beneficial effect of having four or more prenatal care visits on the utilization of trained birth attendants and institutional delivery. This effect was observed after comparing mothers who received treatment (antenatal care visits) with those who did not, while controlling for socio-demographic factors (Ryan et al., 2019).

Children whose mothers received prenatal care (ANC) from experienced ANC providers had a lower likelihood of being classified as malnourished when we simply took into account two factors (ANC visit and ANC provider) as covariates. While the variable ANC visit was determined to be statistically significant after accounting for demographic and clinical factors, the variable ANC provider was found to have no meaningful impact on child malnutrition (Toma et al., 2018). A separate study identified several statistically significant factors that influence the likelihood of receiving antenatal care.

These factors include the type of residence, the respondent's education level, wealth index, decision maker for using contraception, partner's education level, respondent's current employment status, attitudes towards justifying violence if the wife goes out without informing the husband, neglecting the children, arguing with the husband, refusing to have sexual relations, and burning food. Women's body mass index and age at first birth were also found to be significant determinants in Bangladesh (Afroja, 2018). On the other hand, this study aimed to examine the factors associated with barriers to access blood pressure test, blood, and urine test during antenatal care in Bangladesh.

## Method

This study used secondary data from Multiple Indicators Cluster Survey (MICS) 6 which is nationally representative for urban-rural, eight divisions, and 64 districts. The survey protocol was approved by the technical committee of the Government of Bangladesh led by the Bangladesh Bureau of Statistics (BBS). MICS utilizes Computer-Assisted Personal Interviewing (CAPI) and the data collection application was based on the CSPro (Census and Survey Processing System) software version 6.3. The fieldwork was done from January 19, 2019, to June 1, 2019. The dataset is available at https://mics.unicef.org/surveys and can be accessed after registration is approved. The unit of analysis of this study are women who experienced the antenatal care services, with total eligible respondents were 7,607 women.

The dependent variables of this study are experience of blood pressure test, urine test, and blood test during antenatal care with dummy variable (yes/no). The independent variables include age group, educational level, wealth index, and place of residence. The analysis was done using univariate, bivariate (the result is not shown), and multivariate using binary logistic regression. The data analysis was tested using STATA software version 17.

## Result and Discussion

The results in this study consisted of univariate, bivariate (not shown in the paper), and multivariate analysis. Table 1 below describes the univariate analysis as general characteristics of the respondents. It was revealed 8.23% of women could not be able to access blood pressure tests during antenatal care, 23.28% for urine test, and 26.66% for blood test. According to their age, the majority of them were in aged 20 to 24 years old (33.00%). Moreover, more than half of them finished the secondary school (53.69%) and were in fourth quartile of wealth index (21.35%). Surprisingly, more than three fourth of them lived in rural are (78.93%).

**Table 1.** General characteristics of the respondents

| Variables (n = 7,607) | Frequency | Percentage |
|---|---|---|
| Have a blood pressure test | | |
| Yes | 6,981 | 91.77 |
| No | 626 | 8.23 |
| Have urine test | | |
| Yes | 5,836 | 76.72 |
| No | 1,771 | 23.28 |
| Have blood test | | |
| Yes | 5,579 | 73.34 |
| No | 2,028 | 26.66 |
| Age group | | |
| 15-19 | 1,075 | 14.13 |
| 20-24 | 2,510 | 33.00 |
| 25-29 | 2,119 | 27.86 |
| 30-34 | 1,295 | 17.02 |
| 35-39 | 508 | 6.68 |
| 40-44 | 80 | 1.05 |
| 45-49 | 20 | 0.26 |
| Educational level | | |
| Pre-primary or none | 470 | 6.18 |
| Primary | 1,545 | 20.31 |
| Secondary | 4,084 | 53.69 |
| Higher secondary | 1,508 | 19.82 |
| Wealth index | | |
| Poorest | 1,447 | 19.02 |
| Second | 1,463 | 19.23 |
| Middle | 1,543 | 20.28 |
| Fourth | 1,624 | 21.35 |
| Richest | 1,530 | 20.11 |
| Place of residence | | |
| Urban | 1,603 | 21.07 |
| Rural | 6,004 | 78.93 |

Table 2 shows the correlation between all independent variables and blood pressure test, urine test, and blood test. It was revealed that factors associated with blood pressure test are at age 30 – 34 years old, graduated from secondary and higher, were second, middle, fourth, and richest with adjusted odds ratio 0.70, 0.59, 0.29, 0.74, 0.68, 0.53, and 0.31 respectively. Moreover, the factors associated with barriers to urine test are those aged 30-34 years, aged 40-44 years old, finished primary, secondary, and higher secondary school, at the second, middle, fourth, and richest household wealth index, with odds 0.75, 0.53, 0.77, 0.57, 0.35, 0.78, 0.71, 0.50, 0.22, respectively. Furthermore, it was found some variables as the barriers of accessing the blood test such as graduated from secondary, and higher secondary school, being second, middle, fourth, and richest household index with odds 0.57, 0.36, 0.74, 0.66, 0.44, and 0.22 respectively.

The multivariate analysis results showed below can be concluded through the variables which significantly associated with all tests. Those variables are graduated from secondary, and higher secondary, and all categories in household index. In detail, higher educational level decreases the probability to face the barriers to access blood pressure, urine, and blood test. Increasing the wealth index, decreasing the odds of difficulties to access blood pressure test, urine, and blood test.

Table 2. The binary logistic regression analysis

| Variables (n = 7,607) | Have a blood pressure test | | Have urine test | | Have blood test | |
|---|---|---|---|---|---|---|
| | Adj. OR | 95% Conf. interval | Adj. OR | 95% Conf. interval | Adj. OR | 95% Conf. interval |
| Age group | | | | | | |
| 15-19 (ref) | | | | | | |
| 20-24 | 0.95 | 0.74 – 1.21 | 0.99 | 0.84 – 1.18 | 1.05 | 0.89 – 1.24 |
| 25-29 | 0.76 | 0.58 – 0.98 | 0.93 | 0.78 – 1.11 | 1.02 | 0.86 – 1.21 |
| 30-34 | 0.70* | 0.52 – 0.95 | 0.75** | 0.61 – 0.92 | 0.86 | 0.71 – 1.04 |
| 35-39 | 0.98 | 0.69 – 1.41 | 0.89 | 0.69 – 1.15 | 1.02 | 0.79 – 1.31 |
| 40-44 | 0.51 | 0.21 – 1.23 | 0.53* | 0.30 – 0.95 | 0.61 | 0.36 – 1.06 |
| 45-49 | 1.12 | 0.31 – 3.98 | 0.33 | 0.29 – 0.95 | 0.56 | 0.19 – 1.60 |
| Educational level | | | | | | |
| Pre-primary or none (ref) | | | | | | |
| Primary | 0.85 | 0.62 – 1.15 | 0.77* | 0.62 – 0.97 | 0.89 | 0.72 – 1.11 |
| Secondary | 0.59** | 0.44 – 0.80 | 0.57*** | 0.46 – 0.71 | 0.57*** | 0.46 – 0.71 |
| Higher secondary | 0.29*** | 0.19 – 0.44 | 0.35*** | 0.26 – 0.45 | 0.36*** | 0.27 – 0.46 |
| Wealth index | | | | | | |
| Poorest (ref) | | | | | | |
| Second | 0.74* | 0.59 – 0.93 | 0.78** | 0.66 – 0.91 | 0.74*** | 0.64 – 0.87 |
| Middle | 0.68** | 0.53 – 0.87 | 0.71*** | 0.60 – 0.83 | 0.66*** | 0.56 – 0.77 |
| Fourth | 0.53*** | 0.41 – 0.69 | 0.50*** | 0.42 – 0.60 | 0.44*** | 0.37 – 0.52 |
| Richest | 0.31*** | 0.22 – 0.45 | 0.22*** | 0.17 – 0.27 | 0.22*** | 0.18 – 0.27 |
| Place of residence | | | | | | |
| Urban (ref) | | | | | | |
| Rural | 1.11 | 0.87 – 1.43 | 1.10 | 0.94 – 1.30 | 1.15 | 0.98 – 1.34 |

Factors associated with difficulties in accessing antenatal care tests are multifaceted and encompass various individual, social, and health system-related determinants. A study found a range of factors influencing the utilization and access to antenatal care services in different settings, particularly in developing countries. Individual-level factors such as socio-economic status, education level, and knowledge about the importance of antenatal care have been identified as significant determinants affecting the timely initiation of antenatal care (Bakari & Mahiti, 2022; Mare et al., 2022; Wolde et al., 2019). Additionally, unintended pregnancies, lack of awareness, and misconceptions about antenatal care have been reported as barriers to seeking timely care (Adigun & Mngomezulu, 2020).

The result of this study also related with previous study that social and cultural factors, including gender roles, women's autonomy, and decision-making power within the family, play a crucial role in determining access to antenatal care (Mapunda et al., 2022). Cultural norms, gender-based discrimination, and unequal power relations within the family have been identified as barriers to women seeking antenatal care services (Hassen et al., 2021; Shee et al., 2021).

Health system-related factors, such as geographical distance to health facilities, transportation challenges, and the availability and quality of healthcare services, significantly impact access to antenatal care (Leal et al., 2020; Tekelab et al., 2019). Inadequate infrastructure, limited availability of skilled healthcare providers, and

poor quality of care have been reported as barriers to accessing antenatal care services (Konje et al., 2018). Furthermore, the impact of external factors, such as the COVID-19 pandemic, has exacerbated barriers to accessing antenatal care, including disruptions in healthcare services, fear of exposure to the virus, and restrictions on movement (Martin et al., 2022; Pant et al., 2020; Thapaliya et al., 2023). The utilization of antenatal care (ANC) services is influenced by various factors, with education playing a significant role in determining access to these essential services. Studies have consistently highlighted the association between maternal education and the utilization of ANC services, particularly in low-resource settings.

Research has shown that higher levels of education among women are positively correlated with increased utilization of ANC services (Okedo-Alex et al., 2019; Tsegaye & Ayalew, 2020; Zaky et al., 2019). Women with higher education levels are more likely to have better awareness of the importance of ANC, leading to improved health-seeking behavior during pregnancy. Additionally, education empowers women to make informed decisions about their health and encourages them to seek timely and appropriate ANC services.

Conversely, lower levels of education have been associated with reduced access to ANC services (Bhowmik et al., 2020). Women with limited education may face challenges in understanding the significance of ANC, leading to delayed initiation or underutilization of these services (Afolabi & Oseni, 2022). Furthermore, educational disparities can contribute to inadequate knowledge about pregnancy-related health issues, hindering women from accessing essential ANC tests and screenings (Ibrahim et al., 2021).

In addition to individual-level factors, community-based education programs have been recommended to increase the uptake of ANC services, particularly in regions with low educational attainment (Tun et al., 2021). These programs aim to raise awareness about the benefits of ANC and address misconceptions or cultural barriers that may impede access to care (Tsegaye & Ayalew, 2020).

Wealth index has been identified as a significant determinant of access to antenatal care (ANC) services in various studies (Arsenault et al., 2018). Research has consistently shown that women from wealthier households are more likely to utilize ANC services compared to those from poorer households (Basha, 2019). The association between wealth index and ANC utilization underscores the influence of socio-economic status on access to maternal healthcare services (Arefaynie et al., 2022; Felipe-Dimog et al., 2021; Mohamed & Ahmed, 2022).

Furthermore, the role of wealth index in shaping the quality and frequency of ANC visits. Women from wealthier households are more likely to access a higher number of ANC services, indicating a positive correlation between wealth index and the utilization of comprehensive ANC (Azanaw et al., 2021; Martin et al., 2022; Zaky et al., 2019). This suggests that wealthier women have better access to a continuum of ANC services, including essential tests and screenings.

The relationship between wealth index and ANC utilization is particularly significant in low-resource settings, where disparities in access to healthcare services are pronounced. In these contexts, women from poorer households face greater challenges in accessing ANC tests and care due to financial constraints and limited resources (Basha, 2019; Felipe-Dimog et al., 2021; Tsegaye & Ayalew, 2020). Addressing wealth-related inequalities is crucial for improving equitable access to ANC services and ensuring that all women have the opportunity to receive essential antenatal tests and care (Abrha et al., 2019; Arefaynie et al., 2022; Mohamed & Ahmed, 2022).

## Conclusion

The results in this study revealed that educational level and wealth index as the main predictors of inaccessible tests during antenatal care. Increasing level of education and wealth index will decrease the barriers to access testes. Government and stakeholders can focus on education and economics sectors to increase the accessibility to antenatal care especially for blood pressure, urine, and blood test services. In conclusion, blood tests, urine tests, and blood pressure measurements are essential components of antenatal care, providing valuable information about the mother's health and helping to identify and manage any potential risks or complications that may arise during pregnancy. These tests play a crucial role in ensuring the well-being of both the mother and the developing fetus, and are therefore an integral part of comprehensive prenatal care.

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