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# Impact of Migration on the Utilization of Antenatal Care Services among Women of Urban Slums in Bangladesh

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## Abstract

Mothers living in urban slums in Bangladesh get far less access to maternal and child health care services which may lead to mortality or serious morbidity to mothers as well as newborns. Lack of antennal care (ANC) is closely linked to poor pregnancy outcomes including low birth weight, preterm births or infant mortality. However, exposure to migration makes the situation worse in terms of attending urban community health care facilities among women in slums. Since the effect of migration on the usage of antenatal care services in slums has remained an under studied area, this paper aims to examine the adjusted effect of migration on perceiving adequate ANC. Data from the second round of Bangladesh Urban Health Survey conducted in 2013 have been used for this study. A well fitted binary logistic model resulted in lower odds of receiving complete ANC among recently migrated women in slums (AOR=0.602, 95% CI=0.43-0.85). Therefore, further emphasis should be given to increase awareness about antenatal care services among women who are recently migrated to urban slums in Bangladesh.

**Keywords:** Urban slum, Antenatal care, Migration, Urban Health Survey, Odds Ratio

## I. Introduction

Since independence Bangladesh has been experiencing faster urbanization at a yearly average rate of 6 percent, at a time when the national population growth was 2.2 percent[1]. It is expected that the urban area will confine half of total population of Bangladesh by the year 2050[2]. Migration is one of the contributing factors to this fast urban growth, resulting in an increase in informal, poor settlement[3]. Urban slums have lower uptake of maternal health services such as antenatal care (ANC), skilled managing of complications during pregnancy, good hygiene during delivery and child vaccination coverage compared to non-slum residents[4].

Reducing maternal mortality ratio (MMR) to 143 from 574 deaths per 100000 live births within the year 2015 was an aim of Millennium Development Goal (MDG) 5. Although, MMR has been declined significantly to 176/100000 in 2015; still, it is higher than any other countries[5]. In order to reduce maternal and newborn death prompt access to health care during pregnancy and child birth is needed. Antenatal care (ANC), which is considered as a vital strategy for maternal and neonatal mortality reduction is usually referred to pregnancy related care by a health care provider whether it is in medical facility or at home. Interventions associated with ANC include regular check-ups of mothers' health during pregnancy, providing the emergency obstetric care services, communicating health related information, and so on[6]. Though ANC taking benefits are widely known, still in developing countries millions of women do not obtain this facility with proper quality. Moreover, people living in slums are lagging behind in terms of attending ANC services compared to non-slums in urban areas[7]

Migrated mothers are more susceptible to pregnancy related health problems, especially during the early years after migration as the migration status put an additional barrier of taking maternal health service[8]. By using Bangladesh Urban Health Survey (BUHS) 2006, Islam and Gagnon revealed that urban migrated mothers are less likely to take ANC service compared to non-migrated mothers[9]. A study by Kusuma et al found that the under-utilization among recently migrated women contributed to having multiple births, lower education and marriage to an unskilled worker.[10]

Women's participation to the antenatal care services is influenced by different factors. This study assumes that migration status and other socio-economic factors of women would control using package of ANC services. The current research aims to assess the impact of internal migration on the use of antenatal care services among women's age 15-49 years in City Corporation slum areas by using the latest data from BUHS 2013.

## II. Data and Methods

This study utilized the nationwide data of BUHS 2013 (individual recode data). This is second time of this survey after 2006, served to provide key health outcomes and service utilization indicators on intra-urban differentials. A three-stage stratified sampling technique was used to obtain the data. The first stage incorporated a random selection of 634 Mohollas from City Corporations (450) and other urban (184) areas. Second stage executed a mapping activity only in City Corporation strata from which two slum clusters and one non-slum cluster were randomly chosen. Finally, a systematic sample of 30 households (on

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an average) was selected from each cluster. From the selected households, a total of 9014 ever married women with age 15 to 49 years were interviewed who had given births three years preceding the survey and they were asked a number of questions about mother and child health care services including various components of antenatal care services.

This paper aims to examine the influence of migration on utilization of ANC services during pregnancy in urban slums. In this analysis, only last birth was considered in three years preceding the survey and a total of 4066 slum mothers were selected to serve the purpose of the current research.

On the basis of literature review, a set of socio-economic and demographic variables were selected related to utilization of antenatal care services [4, 6,9,10]. Table 1 displayed all the variables used in this analysis.

*Statistical Analysis*

This study comprised of six ANC components- frequency of visit, physical and laboratory examination including measurement of BP, weight, testing blood sample, urine and ultrasound, to create the main outcome variable utilization of complete ANC service, a dichotomous variable with two categories (0 versus 1). The main exposure variable of this study was migration status with two categories recent migrants and settled migrants. To assess the association between covariates and use of complete ANC, Chi-square test was executed and selected significant variables (p-value<0.05). Binary logistic regression model was employed to inspect the adjusted effects of migration status on the utilization of complete ANC. All dichotomous variables were interpreted in terms of the events happening, that is, the comparison was 1 to 0. Each dummy variable was compared with the first group. All the statistical analyses were accomplished using SPSS 20.0 (IBM Corp., Armonk, NY, USA).

**Table 1. Definition of variables used in this study**

| Variables | Value |
|---|---|
| **Response variable** | |
| No of ANC Visit | 0: Having less than 4 visits; 1: At least 4 visits |
| Blood Pressure measured | 0: No; 1: Yes |
| Weight measured | 0: No; 1: Yes |
| Blood sample tested | 0: No; 1: Yes |
| Urine sample tested | 0: No; 1: Yes |
| Ultrasound done | 0: No; 1: Yes |
| Complete ANC | 0: Mother did not receive any of mentioned antenatal care services during pregnancy period; 1: If mother received all of the six antenatal care services during pregnancy with the specified child |
| **Exposure variable** | |
| Migration | 0: Residing in the city more than 2 years are settled migrants<br>1: Residing in the city not more than 2 years are recent migrants |
| **Independent variable** | |
| Mother's age at birth | 1: <20 years; 2: 20-30 years; 3: >30 years |
| Educational status | 1: No education 2: Primary; 3: Secondary or higher |
| Birth order | 1: 1st child; 2:2-3; 3:4 or more |
| Region | 0: Others; 1: Dhaka |
| Religion | 0: Others; 1: Muslim |
| Media Exposure | 0: Not exposed; 1: Exposed to media (listening radio or watching TV or reading newspaper) |
| Working status | 0: Not working; 1: Working |
| Wealth Index | 1: Poor; 2: Middle class; 3: Rich |

## III. Findings

*Characteristics of study participants*

Table 2 displayed the frequencies with percentages of selected socio-economic and demographic characteristics among the respondents by migration status. It was depicted that mothers who were recent migrants were younger in comparison to the mothers of settled migrants (24.04±5.5 vs 25.79±5.65, p-value <0.001). Table 2 presented that 24% of mothers did not have any formal schooling. 65.5% of respondents came from Dhaka division. Most of them followed the religion Islam (94%). 85% of respondents had access to media like watching television, listening radio and reading newspaper. Majority of the mothers were home makers while only 25% were going outside to earn. 70% of the respondents were affiliated to poor socio-economic status. More than half of recent migrants (51.2%) had their first pregnancies.

*Utilization of various components of ANC services*

Various components of antenatal care services by migration status were represented in Table 3. Among settled migrants 31.7% received 4 or more ANC visits where among recent migrants, it was only 18.7%. Reception of different physical and laboratory examination, blood pressure and weight readings were taken on 65.5% and 64% of antenatal mothers, respectively. Urine and blood samples were taken from 53% and 45% of women. Among recent migrants these percentages were lower than those of settled migrants (54% versus 42% for urine testing; 46% versus 31% for blood sample). Ultrasound was conducted among less than half of respondents (46.3%). A significant gap was observed between recent migrants and settled migrants with respect to doing ultrasound (47.5% versus 34.6%).

**Table 2. Percentages and p-values (chi-square test) of socio-economic and demographic characteristics of mothers by migration status, BUHS 2013 data**

| Variables | Total | | Recent Migrants | | Settled Migrants | | p-value |
|---|---|---|---|---|---|---|---|
| | *n* (4066) | % | *n* (379) | % | *n* (3687) | % | |
| **Mother's age at birth** | | | | | | | |
| <20 years | 1174 | 28.9 | 155 | 40.9 | 1019 | 27.6 | 0.081 |
| 20-30 years | 2327 | 57.2 | 187 | 49.3 | 2140 | 58.0 | |
| >30 years | 565 | 13.9 | 37 | 9.8 | 528 | 14.3 | |
| Mean± SD (years) | 25.63±5.67 | | 24.04±5.5 | | 25.79±5.65 | | |
| **Educational Status** | | | | | | | |
| No education | 973 | 23.9 | 86 | 22.7 | 887 | 24.1 | <0.001 |
| Primary | 1614 | 41.2 | 155 | 40.9 | 1519 | 41.2 | |
| Secondary or higher | 1419 | 34.9 | 138 | 36.4 | 1281 | 34.7 | |
| **Birth Order** | | | | | | | |
| 1st | 1610 | 39.6 | 194 | 51.2 | 1416 | 38.4 | <0.001 |
| 2-3 | 1907 | 46.9 | 128 | 33.8 | 1779 | 48.3 | |
| 4+ | 549 | 13.5 | 57 | 15.0 | 492 | 13.3 | |
| **Region** | | | | | | | |
| Dhaka | 2665 | 65.5 | 276 | 72.8 | 2389 | 64.8 | 0.012 |
| Others | 1401 | 34.5 | 103 | 27.2 | 1298 | 35.2 | |
| **Religion** | | | | | | | |
| Muslim | 3831 | 94.2 | 363 | 95.8 | 3468 | 94.1 | <0.001 |
| Others | 235 | 5.8 | 16 | 4.2 | 219 | 5.9 | |
| **Media Exposure** | | | | | | | |
| Exposed | 3456 | 85.0 | 269 | 71.0 | 3187 | 86.4 | <0.001 |
| Unexposed | 610 | 15.0 | 110 | 29.0 | 500 | 13.6 | |
| **Working Status** | | | | | | | |
| Working | 1014 | 24.9 | 109 | 28.8 | 905 | 24.5 | <0.001 |
| Not working | 3052 | 75.1 | 270 | 71.2 | 2782 | 75.5 | |
| **Wealth Index** | | | | | | | |
| Poor | 2846 | 70.0 | 331 | 87.3 | 2515 | 68.2 | <0.001 |
| Middle Class | 856 | 21.1 | 33 | 8.7 | 823 | 22.3 | |
| Rich | 364 | 9.0 | 15 | 4.0 | 349 | 9.5 | |

**Table 3. Utilization of selected components of antenatal care services among the participants segregated by recent migrants and settled migrants (unadjusted odds ratio)**

| Variables | Recent Migrants *n* (379) (%) | Settled Migrants *n* (3687) (%) | Total *n* (4066) (%) |
|---|---|---|---|
| No of ANC Visits (OR=0.497***,95% CI=0.38-0.65) | | | |
| <4 visit | 81.3 | 68.3 | 69.5 |
| 4 or more | 18.7 | 31.7 | 30.5 |
| **Reception of Other Services** | | | |
| BP Measured (OR=0.633***, 95% CI=0.51-0.78) | 55.7 | 66.5 | 65.5 |
| Weight Measured (OR=0.66***, 95% CI=0.53-0.82) | 54.9 | 64.8 | 63.9 |
| Blood Sample Tested (OR=0.538***,95% CI=0.43-0.68) | 31.4 | 45.9 | 44.6 |
| Urine Sample Tested (OR=0.619***, 95% CI=0.50-0.77) | 42.0 | 53.9 | 52.8 |
| Ultrasound Done (OR= 0.58***, 95% CI=0.47-0.73) | 34.6 | 47.5 | 46.3 |

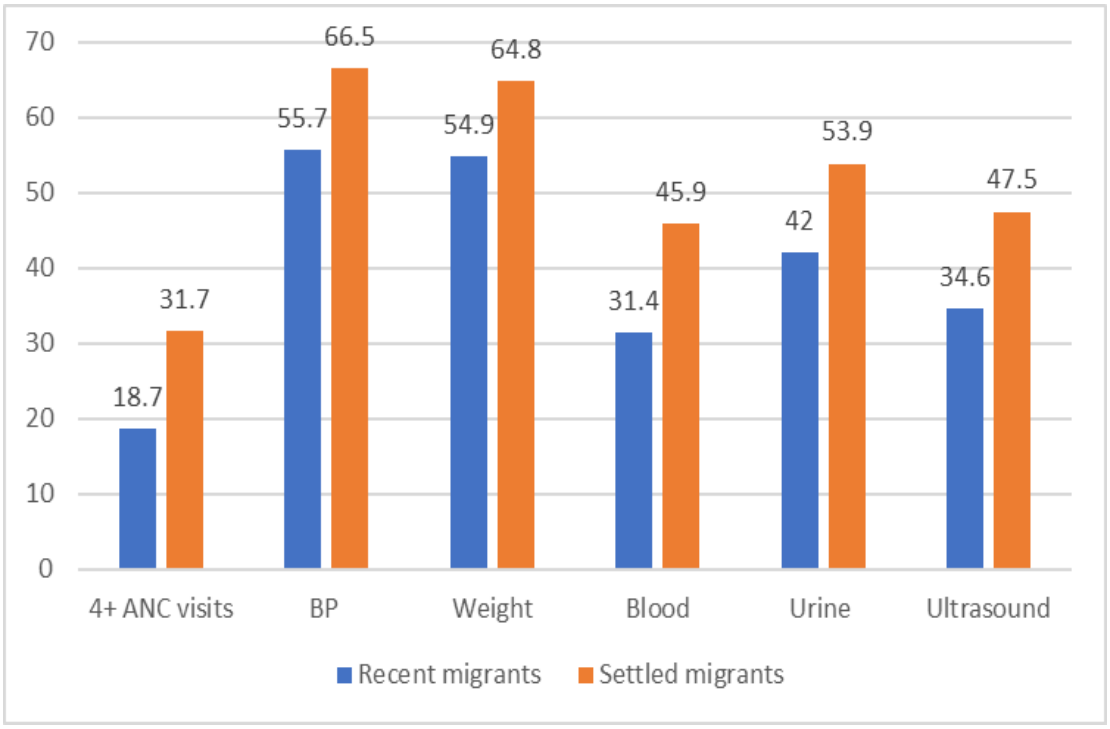


**Fig. 1.** Graphical representation of using ANC components by migration status (recent migration versus settled migration)

*Binary logistic regression model*

To assess the adjusted association of migration on perceiving complete antenatal care, a well fitted binary logistics regression model was executed. Homer and Lemeshow goodness-of-fit test was conducted to check the fit of this model[11]. Let $Y_i$ be the binary outcome of i$^{th}$ individual and $x_i = (1, x_{i1}, x_{i2}, \dots, x_{ik})'$ be the $((K+1) \times 1)$ covariates associated with $Y_i$ . Also, let $\beta = (\beta_0, \beta_1, \beta_2, \dots, \beta_k)'$ be the $((K+1) \times 1)$ vector of regression parameters. For the binary response, one may use the logistic regression model using logit link function. Let, $\pi_i = P(Y_i = 1)$. Under the model, one can write:

$$logit(\pi_i) = log\left(\frac{\pi_i}{1-\pi_i}\right) = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + \cdots + \beta_k X_{ik}$$

The regression parameters were estimated by maximum likelihood estimation method[11]. After controlling all explanatory variables, migration had significant impact on receiving complete ANC (p-value<0.05). Table 4 depicted that recent migrant had 39.8% lower odds of receiving complete ANC compared to the mothers who were settled migrants (AOR=0.602, 95% CI 0.43-0.85). In addition, education, birth order, religion, media exposure, working status and wealth index were also significantly associated in adjusted analysis. On the other hand, region was not significant (AOR=0.992, 95% CI=0.830-1.185).

**Table 4. Unadjusted odds ratio (Migration Status only) and adjusted odds ratios (AOR) with 95% CIs of all selected covariates associated with perception of complete ANC, BUHS 2013**

| Variables | UOR (95% CI) | AOR (95% CI) |
|---|---|---|
| **Migration Status** | | |
| Recent migrants | 0.513 (.371-.710) *** | 0.602 (0.427-0.848) ** |
| Settled migrants (RC) | 1.00 | 1.00 |
| **Educational Status** | | |
| No education (RC) | | 1.00 |
| Primary | | 1.374 (1.056-1.789) * |
| Secondary or higher | | 2.889 (2.215-3.766) *** |
| **Birth Order** | | |
| 1st | | 1.709 (1.236-2.363) ** |
| 2-3 | | 1.495 (1.088-2.052) * |
| 4+ (RC) | | 1.00 |
| **Region** | | |
| Dhaka | | 0.992 (0.830-1.185) |
| Others (RC) | | 1.00 |
| **Religion** | | |
| Muslim | | 0.681 (0.498-0.930) * |
| Others (RC) | | 1.00 |
| **Media Exposure** | | |
| Exposed | | 1.460 (1.080-1.974) * |
| Unexposed (RC) | | 1.00 |
| **Working Status** | | |
| Working | | 0.823 (0.667-1.016) |
| Not working (RC) | | 1.00 |
| **Wealth Index** | | |
| Poor (RC) | | 1.00 |
| Middle Class | | 1.821 (1.495-2.218) *** |
| Rich | | 3.403 (2.638-4.388) *** |

*RC: Reference Category, Significance Level:* ***p< 0.001, **p<0.01, *p<0.05

**iv. Discussion and Conclusion**

Urbanites settling in slums experience poor health coverage than more settled areas. Current rural-urban migrants including many of the most underprivileged migrant families play a significant role behind this disparity[12]. To examine the influence of migration on perceiving adequate antenatal care services in urban slums, the authors extracted data from Bangladesh Urban Health Survey 2013.

This study demonstrated that there were significant differences in the utilization of complete antenatal care services between recent migrants and settled migrants or non-migrant women in urban slums. Results revealed that the average number of ANC visits among recent migrants during pregnancy was 1.93±1.92, which was lower than the reported times of 2.66±3.83 among the settled migrants or non-migrant pregnant women (not shown in the table). When taking the minimum threshold of four times into account, it was found that 31.7% of settled migrants attended at least 4 ANC visits which was higher than the reported percentage (18.7%) of recently migrated women in urban slums of Bangladesh. After controlling all other variables, results represented the lower odds of receiving complete ANC among recent migrant which was consistent with the previous sources of literature. A study in Delhi revealed that recently migrated mothers were 98.8% higher risk of attending inadequate ANC services in comparison to settled migrant[10]. A systematic review of 29 countries conducted by Heaman et al. (2013) demonstrated that migrant women had lower odds of receiving adequate prenatal care (PNC) than that of non-migrant[13]. Another research by Shaokang et al. (2002) revealed that lack of sufficient ANC might lead to life threating conditions among pregnant women and migrants were more vulnerable to receive less maternal health care services than permanent residents[14]. The disparities occur due to lack of awareness with urban maternal health services and lack of eagerness for such services[12]. Number of years lived in slum settlements played a major role in perceiving ANC. Thus, the women who migrated to cities for better livelihood and lived in slums for less than 2 years, received less antenatal care services. The result may be due to lesser exposure of other women who are familiar with different urban community health care facilities and use the benefits of those services[9]. In addition to that lower use of prenatal care services may be the result of a limited supply of health services including maternal health outreach programs for women in slums. Social prejudice against modern and recognized health facilities may work as a barrier to lesser use of such services in urban slums[9].

This study possesses some limitations. The major interest of this study was to examine the influence of migration on complete ANC services, we did not give any explanation to other significant variables associated with antenatal care services. The entire content of ANC could not be assessed because of data unavailability. The current research may be affected by recall bias since the events happened preceding three years from the survey. Last but not the least, use of existing data rather than considering primary data in which questions more closely related to research questions could have been asked to respondents.

Overall health outcomes are extremely miserable in urban slums and recent migrants are the worst victims of this melancholic situation. The study highlighted lesser utilization of antenatal care services of mothers who were recently migrated to urban slums even comparative to the overall disadvantaged migrants who were settled in informal settlements as a whole. The condition demands urgency to improve the supply of health care facilities for the most vulnerable migrants. Awareness building programs by skilled professionals at field level should be held frequently so that migrated women are more exposed to these urban health care activities. Moreover, reducing the cost of maternal health care services plays a significant role to attend more ANC among these poverty-stricken women. In particular, short message service over mobile phone has great potential to address the recurrent service gaps and distractions affecting migrants. It is expected that result from this study will help policy makers in future planning to execute health interventions especially for migrant women in slums and in defining future research agendas.

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