Inequities in Healthcare Seeking Among Migrants and Residents of Climate Affected Coastal Area of Bangladesh

Mosammat Ivylata Khanam (dw.mosammat.khanam@icddrb.org)
International Centre for Diarrhoeal Disease Research

Abdul Khalek
International Centre for Diarrhoeal Disease Research

Syed Manzoor Ahmed Hanifi
International Centre for Diarrhoeal Disease Research

Sabrina Rasheed
International Centre for Diarrhoeal Disease Research

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Abstract

Background:

Climate change induced sea level rise, increased soil salinity and poor socio-economic condition have triggered migration around the world. So far, the impact of migration on health and healthcare utilization have not been studied adequately especially in Bangladesh. Our study examines impact of migration on healthcare seeking behavior of people living in low-lying coastal areas of Bangladesh.

Methods:

We analyzed data from Chakaria, Health and Demographic Surveillance System, 2017-18. Univariate analysis and regression analysis were conducted to assess the determinants of migration. Finally, we assessed differences in health care seeking behavior between migrants in low-lying coastal areas and plain areas. Stata version 14 was used for analysis.

Results:

In terms of determinants of migration, adults, males, educated, unemployed and poor were significantly more like to migrate compared to children, females, people with little education, those engaged in agriculture or other occupations and wealthier households. For pregnancy related services healthcare utilization was significantly lower in coastal areas compared to the plains. In terms of utilization of maternal and child health services, service use was 2-28 % lower among residents of low-lying coastal regions and 13-70% lower among coastal migrants compared to those living in plains.

Conclusion:

Our findings suggest that in terms of maternal health services there was geographic inequity in service utilization favoring the residents of plains and being a migrant significantly increases the geographical disadvantage in terms of maternal health services. The existing inequity indicates the necessity of immediate action to address the health and healthcare utilization of residents of coastal area with special attention to the migrants in Bangladesh.

Introduction

Bangladesh has been recognized as one of the most vulnerable countries to natural disasters aggravated by global climate change due to its unique geographical location [1]. Bangladesh currently is ranked sixth on Global Climate Risk Index in 2017 for climate vulnerability [2]. Within Bangladesh, densely populated country the coastal communities have experienced highest number of natural disasters than any other regions of Bangladesh [3, 4]. In addition to the prevailing population density, poverty and weak infrastructure, population of coastal areas have suffered from frequent natural disasters such as floods, cyclone, storm and saline intrusion of soil and water due to proximity to the ocean, low elevation and river bank erosion, which has impact on their livelihood and health [1, 5]. In global literature and research
conducted in Bangladesh, researchers have reported that the climate change has adversely affected land and water leading to food and water insecurity and therefore, reduced health and wellbeing [6–8]. In terms of health indicators coastal population tend to suffer from greater burden of communicable and non-communicable diseases such as hypertension and cardiovascular diseases (CVD) [9, 10]. Researchers have associated the rise in CVDs, still birth and miscarriage to higher consumption of salt among coastal population [10–12]. Also, poor coastal people find difficulties in accessing necessary primary healthcare services particularly maternal and child healthcare (MCH) because of the sub-standard healthcare delivery system (availability, accessibility, utilization, adequate and effective coverage) and limited skilled healthcare providers compared to other parts of the country [13, 14]. Further, the adverse impact of climate change on livelihood has led to impoverishment and migration [15, 16].

In Bangladesh about 2.5 million coastal residents are displaced each year due to natural disasters [17]. Researchers have studied the impacts of climate change on health, resources, human settlement, as well as adaptation to climate change such as migration in Bangladesh [3, 18–23]. It is projected by 2050, around 140,000 coastal residents will be forced to migrate within the district and about 60,000 outside the district to increased soil salinity [24]. Based on some projections the number of Bangladeshis displaced by impacts of climate change could reach 13.3 million by 2050 [25]. In previous studies of migration pattern in Bangladesh researchers described migration as a coping strategy to deal with poverty with mostly male members and sometimes families migrating out of their area in search of better employment opportunities [26]. Migration is less likely among women, children, elderly and disabled population [27]. When the reason for not migrating was explored, researchers found that attachment to property and power, homeland and familial responsibilities were important factors for people to stay in their area of residence [28]. Migration have shown to impact the health of migrants adversely [29, 30]. Little is known about the impact of migration on health service utilization specially if migrant settle in climate affected coastal communities. In the current study we have utilized the strength of existing data from Health and Demographic Surveillance System (HDSS) to investigate the impact of migration on healthcare service utilization geographically diverse coastal region of Bangladesh. The findings will provide an insight about strengthening the health systems for migrants in Bangladesh.

**Methods**

This secondary data analysis was conducted by using Chakaria HDSS data from 2017-2018. Chakaria HDSS is one of the field sites of International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) established in 1999 that collects data regarding socio-demographic and health indicators such as birth, death, marriage, education, occupation, health and health services utilization in regular intervals in Chakaria [31]. Chakaria is subdistrict under Cox's Bazar district located in the South-East of Bangladesh. Chakaria is geographically diverse and contains hilly areas in the east, coastal low-lying areas in the west as well as plain land.

For our analysis we used information from mothers and children (12-23 months of age) who were residents of plains and the low-lying coastal regions of Chakaria. In terms of migration we exclude any
migration that happened within the same area and migration due to marriage for our analysis. In terms of healthcare utilization, we considered maternal and child care services such as antenatal care, postnatal care, trained assistance during delivery (skilled birth attendant, doctor or nurses) among recently delivered mothers and immunization (12-23) month old children.

To explore the association between healthcare seeking behavior and contextual variables, Chi-square test was performed. A logistic regression analysis was carried out to assess the factors that are significantly associated with migration. To identify the inequity in health service utilization we used the service utilization rates of plain area as reference and compared this with service utilization rates in coastal residents and coastal migrants to assess inequities. Data analysis was done using Stata version 14.

Results

Table 1: Socio-demographic characteristics of migrant and non-migrant population in coastal area and plains of Chakaria in 2018
In terms of socio-demographic characteristics, most of the migrants and non-migrants of both areas were adults (Table 1). Majority people (both migrants and local) from both areas had no institutional education and were engaged as day laborer compare to other professions. Wealth quantile of migrant people from both areas were comparatively lower than local people.

Table 2: Sociodemographic determinants of migration during 2018 in rural Chakaria
<table>
<thead>
<tr>
<th>Socio-demographic characteristics</th>
<th>Migration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AOR (95% CI)                  P value</td>
</tr>
<tr>
<td>Geographical location</td>
<td>Low-lying coastal Reference</td>
</tr>
<tr>
<td></td>
<td>Plain                          1.04 (0.99-1.08)  0.067</td>
</tr>
<tr>
<td>Age</td>
<td>&lt;15 years Reference</td>
</tr>
<tr>
<td></td>
<td>(15-49) years                   1.09 (1.01-1.17)  0.025</td>
</tr>
<tr>
<td></td>
<td>50+ years                       0.37 (0.31-0.44)  0.000</td>
</tr>
<tr>
<td>Sex</td>
<td>Female Reference</td>
</tr>
<tr>
<td></td>
<td>Male                           1.14 (1.06-1.23)  0.000</td>
</tr>
<tr>
<td>Years of schooling</td>
<td>No education Reference</td>
</tr>
<tr>
<td></td>
<td>0-5 years                       1.02 (0.93-1.11)  0.633</td>
</tr>
<tr>
<td></td>
<td>6-10 years                      1.11 (1.00-1.24)  0.037</td>
</tr>
<tr>
<td></td>
<td>10+                             1.54 (1.31-1.81)  0.000</td>
</tr>
<tr>
<td>Occupation</td>
<td>Agriculture Reference</td>
</tr>
<tr>
<td></td>
<td>Day laborer                     1.54 (1.35-1.766)  0.000</td>
</tr>
<tr>
<td></td>
<td>Others                          1.74 (1.52-1.99)  0.000</td>
</tr>
<tr>
<td></td>
<td>Unemployed                      2.27 (1.98-2.60)  0.000</td>
</tr>
<tr>
<td>Wealth quintile</td>
<td>Highest Reference</td>
</tr>
<tr>
<td></td>
<td>Middle                          1.04 (0.94-1.14)  0.386</td>
</tr>
<tr>
<td></td>
<td>Lowest                          1.69 (1.52-1.87)  0.000</td>
</tr>
</tbody>
</table>

In terms of geographical location, people from the plains were more likely to migrate compared to those living in the coastal area although this association was not significant (Table 2). Compared to people aged less than 15 years, migration rate was significantly higher among 15-49 age group (OR:1.09, 95% CI:1.01-1.17) and lower among people older than 50 years of age (OR:0.37, 95% CI: 0.31-0.44). Males were significantly more likely to migrate (OR:1.14, 95% CI:1.06-1.23) compared to females. Compared to those with little or no education those with higher education (OR:1.54, 95% CI:1.31-1.81) were significantly more likely to migrate. Compared to those engaged in agriculture, those in other occupations (OR:1.74, 95% CI:1.52-1.99) were significantly more likely to migrate with unemployed people (OR:2.27, 95% CI:1.98-2.60) having the highest likelihood of migration. In terms of household wealth quintile,
compared people from wealthier households, those from poorest households (OR: 1.69, 95% CI: 1.52-1.87) were significantly more likely to migrate.

**Table 3:** Healthcare utilization based on area of residence during 2017 and 2018

<table>
<thead>
<tr>
<th>Variables</th>
<th>Chakaria [recently delivered mothers, n=3218; (12-23) months old children, n=4188]</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Plains area, n (%)</td>
<td>Coastal area, n (%)</td>
</tr>
<tr>
<td>ANC (received at least 4 visit)</td>
<td>673 (20.9)</td>
<td>153 (4.7)</td>
</tr>
<tr>
<td>Delivery by SBA</td>
<td>1067 (33.2)</td>
<td>242 (7.5)</td>
</tr>
<tr>
<td>PNC (received at least 1 visit)</td>
<td>1328 (41.3)</td>
<td>326 (10.1)</td>
</tr>
<tr>
<td>Child immunization</td>
<td>2791 (66.6)</td>
<td>963 (23.0)</td>
</tr>
</tbody>
</table>

In a subsection of population, pregnant women and mothers of young children we explored the utilization of primary health care services such as antenatal care (ANC), delivery attendance by skilled birth attendants (SBA), postnatal care (PNC) and child immunization. We found that maternal service utilization was significantly higher among residents of plains compared to those living in coastal areas. However, in terms of utilization of immunization services there was no significant differences between residents of plain and low-lying coastal area (Table 3).

**Table 4:** Inequities of healthcare utilization based on area of residence and migration status in rural Chakaria (2017 & 2018)
<table>
<thead>
<tr>
<th>Variables</th>
<th>Plain non-migrants</th>
<th>Coastal non-migrants</th>
<th>Coastal migrants</th>
<th>% change</th>
<th>Plain non-migrants vs. Coastal non-migrants</th>
<th>Plain non-migrants vs. Coastal migrants</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANC (received at least 4 visits)</td>
<td>27.5</td>
<td>19.8</td>
<td>9.7</td>
<td>28.0</td>
<td>64.7</td>
<td></td>
</tr>
<tr>
<td>Delivery by SBA</td>
<td>43.5</td>
<td>31.5</td>
<td>13.0</td>
<td>27.6</td>
<td>70.1</td>
<td></td>
</tr>
<tr>
<td>PNC (received at least 1 visit)</td>
<td>54.4</td>
<td>42.3</td>
<td>22.6</td>
<td>22.2</td>
<td>58.5</td>
<td></td>
</tr>
<tr>
<td>Child immunization (12-23 months)</td>
<td>89.5</td>
<td>91.3</td>
<td>77.5</td>
<td>2.0</td>
<td>13.4</td>
<td></td>
</tr>
</tbody>
</table>

Assuming that the health service utilization of the residents of the plains were the benchmark for what is expected in Chakaria, we compared the rates of health service utilization among residents of plains with that of the coast and the migrants living in coastal area. Compared to residents of plains, utilization of different maternal and child health care services among coastal residents were 2-28% lower (Table 4). Compared to residents of plains, utilization of different maternal and child health care services among coastal migrants were 13-70% lower.

**Discussion**

Although studies on impact of climate change human lives, both health and non-health aspects, and migration as a coping mechanism has been studied around the world, less is known about utilization of health services among migrants especially in climate vulnerable coastal areas. Our study is the first to use strength of longitudinal data on migration and health care utilization to study the determinants of migration in climate vulnerable coastal area of Bangladesh and assess how intersection of coastal residence and migration create inequities in health care utilization. The findings from the study will be applicable to 2.5 million residents of several coastal regions of Bangladesh who are displaced every year due to frequent natural disasters and similar populations in low resource settings [17]. Further the insights will help to inform policies and programs to reduce inequities in health service utilization among migrants who live in coastal areas.
According to our study findings, adults (≥15 years) were more likely to migrate compared to other age groups and more males migrated compared to females. Previous researches also reported that mostly adults were migrated in search of employment opportunities and in our cultural setting gender role assigned to men as breadwinners made them more likely to move in search of opportunities [32, 33]. On the other hand, we also observed that compared to those with little or no education, those with better educational status were more likely to migrate. Several studies suggested the similar findings which may indicate that education provide more job opportunities to people which in turn encourages migration [34–37]. In our study, we found that people engaged in agricultural professions were less likely to migrate compared to people in other professions. In previous studies, researchers explained that those engaged with agriculture often owned land and had better social status and power in the context of rural Bangladesh which probably discourages migration [38, 39]. Our study findings also demonstrated that members from poorest households were more likely to migrate than wealthier households. Similar findings were reported in several studies where researchers explained that the poor with limited resources are very vulnerable to natural disasters and lacking the resources to recover, often resort to migration for better employment opportunities [40, 41].

In this study, we found only 4.7%, 7.5% and 10.1% women of coastal areas accessed maternal healthcare services in terms of ANC, assisted delivery by SBA and PNC services respectively, significantly lower compared to those living in plains and the national average [42]. Previous research conducted in geographically adverse rural areas of Bangladesh and other countries also reported the similar findings [43–49]. Researchers discussed a number of barriers of healthcare utilization at individual, community and health systems-level. At individual-level, lack of education, knowledge and awareness, poverty, limited mobility and autonomy of women; at community-level, difficulties in accessing health facilities due to lack of road and transport, cultural barriers related to using health facilities, and tradition of using local untrained traditional birth attendants; and at health systems-level, limited and expensive services and disrespectful behavior of health workers towards poor were associated with low service utilization [46, 49, 50]. The low service utilization was also apparent for child immunization, a primary care service with 95% national coverage [51] in the study population. The rate of child immunization coverage was only 23% among children of coastal areas, compared to that of the residents of the plains (67%). Previous studies conducted in rural or hard to reach areas of Bangladesh and other developing countries reported the lower childhood immunization rate than national average [52–58]. Although in Bangladesh the vaccination services are free of charge, Factors such as geographical and social inequalities, poor income, transportation cost, fragile communication system, limited knowledge and awareness about the benefit of vaccination, fear, stigma and lack of autonomy in decision making among mothers, have been associated with low rates of immunization among children [59–67].

Our research indicated that the intersection of living in disadvantaged areas and migration compounded the inequities in healthcare utilization. Our study findings showed that people who migrate in geographically vulnerable low-lying coastal areas have lower service utilization than residents. Researchers have described inequities in healthcare utilization among migrants compared to residents of the areas [68] [69]. Several factors such as higher mobility, financial hardship, being poorly informed
about health risk and available health facilities, high healthcare cost relative to income have shown to adversely affect the use of healthcare services among the migrants [46, 70–72].

Bangladesh has made remarkable progress in achieving several health indicators as indicated by the achievement of Millennium Development Goals (MDG 4 and 5) related to maternal mortality and child mortality [73]. However, given that Bangladesh is one of the countries most affected by climate change and contain 2.5 million climate migrants, it is imperative that health of the migrant population is given priority [1, 17]. To achieve Sustainable Development Goal (SDG10) related to reducing inequality in the population, it is important that gaps in service provision are addressed and barriers to healthcare seeking among vulnerable and hard to reach populations such as the migrants, are removed [74]. While climate migrants use migration as an adaptation strategy it is important that health systems have the provision to ensure that primary care is accessible and available to the migrants while they make efforts to overcome poverty. Multi-sector partnership, coordinated efforts, migration-friendly policies and strategies are needed to develop the migration-sensitive health systems.

The significant strength of this paper was that we analyzed the longitudinal data from multiple years which allowed us to look at trends over time and have sufficient numbers to look at determinants. This study also had few limitations that should be acknowledged. This study was cross sectional in nature, so it does not permit any cause and effect relationship to be inferred. As the analysis was done based on existing data we could not add any questions to refine our inquiry.

**Conclusion**

In terms of determinants of migration adults, males, educated, poor and unemployed were more likely to migrate than the others. In terms of utilization of maternal and child health care services, residents of coastal areas had lower health healthcare utilization rates than those who lived in adjacent plain area. The disadvantages of living in coastal area were more pronounces among the migrants. The insights from this study would be useful for creating a migration-sensitive health systems in the future.

**Abbreviations**

ANC: Antenatal Care; CVD: Cardiovascular diseases; HDSS: Health and Demographic Surveillance System; MCH: Maternal and Child Healthcare; MDG: Millennium Development Goal; PNC: Postnatal Care; SBA: Skilled Birth Attendant; SDG: Sustainable Development Goal

**Declarations**

**Ethics approval and consent to participate:**

We conducted a secondary analysis of Chakaria HDSS data. Chakaria HDSS survey protocol (ACT-00230) was approved by Research Review Committee (RRC) and Ethical Review Committee (ERC) of International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) and written informed consent
was obtained from all the participants before participating in the study. The original Chakaria HDSS data collection with all methods were carried out in accordance with national ethical guidelines and regulations (which conforms to the declaration of Helsinki).

**Consent for publication:**

Not applicable

**Availability of data and materials:**

Data we used in this manuscript are not publicly available due to the data policy of icddr,b. Data are available upon reasonable request for researchers from Armana Ahmed (armana@icddrb.org), Head of Research Administration of icddr,b, and as per the data access policy of icddr,b.

**Competing interests:**

None declared.

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**Author’s contribution:**

Mosammat Ivylata Khanam: Conceptualization, data curation, analysis and interpretation of data, writing original draft, Abdul Khalek: Analysis and interpretation of data, Sabrina Rasheed: Conceptualization and writing original draft. SR provided guidance with respect to the whole research, including methodological guidance. All authors critically reviewed, edited and approved the final manuscript

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