



Socioeconomic inequality in maternal healthcare: An analysis of regional variation in Bangladesh



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ABSTRACT

Socioeconomic inequality in the utilisation of maternal healthcare services is well-documented in Bangladesh. However, the spatial dimension of this inequality is largely unexplored in the literature. This study examined the regional variation of wealth-related inequality in the utilisation of maternal healthcare services using data from Bangladesh Demographic and Health Survey, 2014. The highest extent of pro-wealthy inequality was found in Chittagong and Sylhet for ANC services compared to Khulna and Rangpur where inequality was the lowest. Pro-wealthy inequality was the lowest in Rangpur while Dhaka and Barisal tended to have the greatest degree of inequality for delivery care services. Policy efforts aiming to tackle socioeconomic inequality in maternal healthcare should consider this spatial dimension of inequality in Bangladesh.

1. Introduction

Despite remarkable progress to decline maternal mortality over the last three decades, poor maternal health during pregnancy is still a major public health problem in many developing countries. In 2015, maternal mortality ratio (MMR) remains high at 298 and 443 maternal deaths per 100,000 live births in low-middle and low-income countries, respectively (Kassebaum et al., 2016). Socioeconomic inequality in access to and utilisation of maternal healthcare services also persists in these countries (Victora et al., 2016). The MMR of a country is largely influenced by the coverage of maternal healthcare services, such as antenatal care (ANC), skilled birth attendance, facility-based deliveries and access to emergency obstetric care services including caesarean section (C-section) (Friberg et al., 2010). Recent estimates suggest that the target to reduce MMR to less than 70 maternal deaths per 100,000 live births by 2030 requires a coverage of 91% for any ANC visit, 78% for at least four ANC visits, 81% for facility-based deliveries and 87% for skilled birth attendance (Kassebaum et al., 2016).

Universal health coverage (UHC) is necessary for achieving equity in healthcare systems but this may not necessarily translate into better

health for the disadvantaged population groups (Gwatkin and Ergo, 2011; Victora et al., 2003). The importance of equitable health systems for improving health outcomes is increasingly recognized (Baum, 2016; Putland et al., 2013; Victora et al., 2003) and also demonstrated for maternal healthcare services like ANC (Neal et al., 2015), skilled birth attendance (Barros et al., 2012) and facility-based deliveries (Alkenbrack et al., 2015). The Millennium Development Goals (MDGs) were set to improve average outcome and attain equity in health and healthcare at the country level. However, one problem with focusing on the national achievements alone is that it could mask within country socioeconomic inequality. Thus, it is important to understand whether observed inequality is due to inequality between or within geographical areas (Wagstaff, 2005a). Regional differences in socioeconomic inequality are important when countries design strategies to improve equity in access to and use of healthcare services. Geographical targeting of programmes could be a complement to socioeconomic targeting and perhaps more effective when the deprived group is highly geographically concentrated. Therefore, regional analysis of socioeconomic-related inequality would have considerable importance for monitoring inequity in use of maternal healthcare services in the

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postMDGs era (Hosseinpoor et al., 2014).

Socioeconomic inequality in healthcare service use is evident in both high and low-income settings. Cross-national comparative studies suggest that inequality in the utilisation of healthcare services is closely linked to low coverage, and high inequality is observed when services are predominantly used by the relatively more privileged groups (Victora et al., 2012). However, the variation in inequality of healthcare use at sub-national levels has been less studied (Jiménez-Rubio et al., 2008; Lavado and Lagrada, 2008; Lumme et al., 2008; Mangano, 2010). A comparison among Canadian provinces showed that the number of visits to general practitioners in Quebec were not only fewer, but also more predominantly benefited the rich compared to other provinces (Jiménez-Rubio et al., 2008). Similarly, a study in the Philippines found that income-related inequality in use of maternal and child care services varied considerably between regions, suggesting a need to apply different regional strategies (Lavado and Lagrada, 2008).

Maternal health in Bangladesh has improved faster than expected, with an average annual decrease in the MMR of 4.3% from 2000 to 2015 compared to a 3.3% decline in South Asia (Kassebaum et al., 2016). However, the MMR is still high at 245 per 100,000 live births despite several reforms of the health sector (Kassebaum et al., 2016). Moreover, estimates from 2010 show substantial inequality in MMR related to the wealth gradient at 123 and 234 maternal deaths per 100,000 live births among the richest and the poorest, respectively (NIPORT et al., 2013). There is also a regional variation in the MMR. Bangladesh is administratively divided into seven divisions (hereafter regions) and MMR ranges from 64 per 100,000 live births in Khulna to 425 in Sylhet, with the remaining five regions ranging between 168 and 196 per 100,000 live births (NIPORT et al., 2013). This regional inequality in MMRs could be a result of the socioeconomic-related unequal utilisation of ANC and delivery care services in specific regions.

The region may serve as a proxy for geospatial variation in broader economic, cultural, and development contexts which profoundly shape population health outcomes. In many ways, regional inequality in health and healthcare in Bangladesh is shaped by the regional variation in income and non-income indicators of social deprivation (Sen and Ali, 2015). The western regions (Rajshahi and Rangpur) have relatively high rates of income poverty compared to the eastern regions (Chittagong and Sylhet) (Ali et al., 2015; Sen and Ali, 2015; World Bank et al., 2010). Although the concentration of poverty is higher in the western regions, these regions are marked by a relatively low level of non-income indicators of social deprivation such as poor transportation system, lack of main access roads, lower access to education, etc. (Sen and Ali, 2015). On the other hand, despite low levels of extreme poverty, eastern regions, especially the Chittagong Hill Tracts and coastal belts under Chittagong and ecologically vulnerable north-eastern regions under Sylhet, have many areas characterised by physical remoteness, wetland eco-systems, protracted ethnic conflicts, and social conservatism. These regional factors potentially constitute income and non-income barriers to access healthcare services.

Some studies found that certain regions in Bangladesh such as eastern, coastal, and Chittagong Hill Tracts have disproportionately high rates of maternal mortality (Ahmed and Hill, 2011). The higher mortality in these regions has been attributed to such contextual factors as poorer transportation systems, remoteness, social conservatism, economic disadvantage, and ecological vulnerability (Ahmed and Hill, 2011; Gruebner et al., 2017). The poor transportation system is one of the important non-income access barriers to healthcare services in Bangladesh. For example, the under-five mortality rate is 14% higher in communities with poor access to roads in Bangladesh (Huda et al., 2016). Given the spatial clustering of ecological vulnerability and physical remoteness, we expect that eastern regions in Bangladesh would have higher levels of socioeconomic-related inequality in maternal healthcare utilisation than other regions. It is reasonable to assume that, compared to economically disadvantaged households, greater economic resources and social support in wealthier households

would result in overcoming the barriers to healthcare access in relation to poor transportation systems, physical remoteness and other structural barriers.

The existing literature on socioeconomic inequality in maternal healthcare use in Bangladesh primarily used various rounds of Bangladesh Demographic and Health Survey (BDHS) (Anwar et al., 2015; Collin et al., 2007; Hajizadeh et al., 2014; Zere et al., 2013). These studies provided national estimates of socioeconomic inequality in the utilisation of various maternal healthcare indicators. In general, they found that inequality in use of ANC and delivery care services persistently favoured better-off women, but there was a gradual progress towards equitable utilisation. This inequality was generally the lowest for the services provided in communities or primary healthcare (e.g. ANC) and the highest inequality was seen for hospital-based services (i.e. C-section). However, a recent study demonstrated that wealth-related inequality in four or more ANC visits increased between 2011 and 2014 in Bangladesh (Rahman et al., 2017). Few studies further examined inequality in maternal healthcare utilisation disaggregated at rural-urban level. These studies suggested that the decline in inequality was more pronounced in the urban area than in the rural area, thus widening the rural-urban gap in inequality of maternal healthcare service use (Kamal et al., 2016; Pulok et al., 2016).

Previous studies on the national analysis of socioeconomic inequality have been important to monitor progress towards UHC in maternal healthcare in Bangladesh. However, these studies did not consider the implications of regional contexts that may shape the inequality in maternal healthcare. National inequality could be driven by between-region differences in inequality of maternal healthcare service utilisation. Existing studies primarily focus on examining the variation in the average utilisation of maternal healthcare services across the regions of Bangladesh without explicitly considering the spatial dimension of socioeconomic inequality in maternal healthcare use. In this study, we used the Erreygers's concentration index to analyse the spatial variation in wealth-related inequality by considering the differences in the average level of utilisation across seven regions. Our study thus extends the current literature of maternal healthcare service use in Bangladesh by providing the first empirical evidence of regional variation in socioeconomic inequality in six outcomes of ANC and delivery care services.

2. Data and methodology

2.1. Data source and sample

This study used de-identified data from the Bangladesh Demographic and Health Survey (BDHS) undertaken in 2014. The BDHS has been conducted every three years since 1991–92 and is a representative survey of the entire population of Bangladesh. The BDHS-2014 applied a two-stage stratified sampling procedure to select households from the seven administrative regions in Bangladesh. In the first stage, 600 enumeration areas (EAs) were selected based on the 2011 population census, with probability proportional to the EA size. A sampling frame was then generated by a thorough listing of all households in the selected EAs. The second stage of the sampling involved selecting 30 households on average per EA for urban and rural areas separately within each administrative region, resulting in a sample of 18,000 households. Out of the 18,245 ever-married women aged 15–49 identified from the selected households, 17,863 were successfully interviewed, with a response rate of around 98% (NIPORT et al., 2016). In the current study, we restricted our sample to women who had given birth to at least one live child in the three years preceding the survey. When a woman had more than one live birth, data related to the most recent live birth were used, resulting in a sample of 4483 women for the analysis.

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