Anaemia and its Determinants Among Pregnant Women: A Study in Urban Slums of Kolkata Metro City

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Abstract

Anemia among pregnant women remains a significant public health concern, particularly in urban slum areas where access to healthcare and proper nutrition is often limited. Iron deficiency anemia is a pervasive issue, particularly impacting pregnant women and adolescent girls, considered by the World Health Organization with hemoglobin levels below 11 g/dl. On a global scale, as of 2019, 37% of pregnant women and 30% of women aged 15 to 49 experience anemia. NFHS-5 data reveals that the prevalence of anemia among pregnant women in urban areas of India stands at 45.7%. This study explores the multifaceted factors influencing the prevalence of anemia among pregnant women residing in the urban slums of Kolkata, India.

The study adopted a mixed-methods approach, combining quantitative surveys and qualitative interviews to comprehensively assess the determinants of anemia among pregnant women in the Urban slums of Kolkata. Quantitative data collection involves structured surveys administered to pregnant women, focusing on socio-demographic characteristics, dietary habits, access to healthcare services, and knowledge of anemia prevention and management. Qualitative interviews delve deeper into the experiences and perceptions of pregnant women regarding anemia, exploring cultural beliefs, social norms, and barriers to accessing healthcare services. Additionally, healthcare providers and community health workers contribute insights into the challenges faced in addressing anemia in urban slum settings.

Preliminary findings suggest that several interconnected factors contribute to the high prevalence of anemia among pregnant women in urban slum areas of Kolkata. These include inadequate antenatal care, limited availability of iron-rich foods, poor sanitation and hygiene practices, cultural beliefs surrounding pregnancy and nutrition, and socio-economic constraints.

The study underscores the importance of multi-sectoral interventions aimed at addressing the complex determinants of anemia among pregnant women in urban slums. Effective strategies may involve improving access to antenatal care services, promoting nutrition education and supplementation, enhancing sanitation infrastructure, and fostering community engagement to challenge harmful cultural norms.

By elucidating the nuanced factors influencing anemia in this vulnerable population, this research seeks to inform targeted interventions and policies aimed at improving maternal and child health outcomes in urban slum areas of Kolkata and similar settings worldwide.

Keywords: Anemia, Maternal Health, Pregnant Women, Urban Slums, Metro City.


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Introduction

Anaemia stands as a formidable public health challenge, particularly impacting vulnerable demographics such as young children, expectant mothers, and adolescent girls. Its prevalence is underscored by an intricate interplay of factors including but not limited to nutritional insufficiencies, suboptimal dietary patterns, susceptibility to infections, chronic ailments, gynaecological and obstetric disorders, and insufficient intake of iron-rich foods. Globally, approximately 37 percent of pregnant women grapple with anaemia, a statistic that casts a stark light on the disparities pervasive in low and middle-income nations, particularly among those ensnared in socioeconomically disadvantaged circumstances. This issue underscores the imperative for comprehensive interventions aimed at bolstering nutritional support systems, enhancing healthcare access, and addressing systemic inequities to alleviate the burden of anaemia in afflicted populations (Baig-Ansari, 2008).

Developing nations, among them India, boasting a populace exceeding 1.21 billion and ranking amongst the world's most populous, grapple with enduring obstacles. This reality is starkly evident in its 2021 Global Hunger Index score, standing at 27.5, a ranking positioning it at 94th out of 101 nations. Regrettably, this figure reflects a decline from the previous year, signalling a concerning trend. Despite commendable strides in curbing maternal, child, and infant mortality rates, the spectre of nutritional inadequacies looms large. Of particular concern is the escalating prevalence of anaemia among expectant mothers, underscoring the urgent need for targeted interventions to address this pressing public health challenge and safeguard the well-being of vulnerable populations (V. P., 2002).

Gender discrimination emerges as a pivotal factor influencing the onset of anaemia during pregnancy, exerting a pronounced impact on women who grapple with economic deprivation, limited educational opportunities, or marginalization based on caste affiliations. The deleterious ramifications of such discrimination on women's health manifest starkly through heightened rates of morbidity and mortality during pregnancy (Merza, 2014) (Sharif, 2023). Anaemia, in particular, emerges as a nexus of concern due to its far-reaching implications for both mother and foetus, escalating the risks associated with maternal and perinatal mortality (Varghese, 2019) (Viveki, 2012). Consequences of anaemia span from debilitating fatigue and compromised work capacity to compromised immune function, heightened vulnerability to cardiovascular ailments, and increased mortality rates for expectant mothers. Research underscores the sobering reality that anaemia during pregnancy accounts for a substantial 23 percent of indirect causes contributing to maternal mortality in developing nations. Against this backdrop, the focal aim of this study is twofold: To delineate the prevalence of severe anaemia among pregnant women within the study cohort and to elucidate the intricate interplay between anaemia and various sociodemographic determinants, shedding light on avenues for targeted intervention and comprehensive healthcare initiatives (Sharif, 2023).

Objectives of the Study

- To determine the magnitude of anaemia among pregnant women residing in Urban Slums of Kolkata according to severity among the study population, and
- To understand the association between anaemia in regard to different socio-demographic factors of slums dwelling families

Materials and Methods

The overarching objectives of this study are twofold: firstly, to gauge the extent of anaemia severity prevalent among pregnant women within the study cohort, and secondly, to discern the interrelationship between anaemia and diverse socio-demographic variables. By meticulously evaluating the spectrum of anaemia severity, ranging from mild to severe, this research endeavours to provide a comprehensive understanding of the prevalence landscape within the target population. Furthermore, through rigorous
statistical analyses, the study aims to uncover correlations between anaemia incidence and a range of socio-demographic factors, encompassing but not limited to age, education level, socioeconomic status, geographical location, and access to healthcare resources. By elucidating these associations, the study seeks to furnish invaluable insights into the multifaceted determinants of anaemia during pregnancy, thereby informing targeted interventions and policy measures aimed at mitigating its impact and fostering improved maternal health outcomes.

The study formed an integral component of an expansive cohort endeavouring to delineate Maternal and Child Health dynamics, with a particular emphasis on monitoring and follow-up of high-risk pregnancies, anaemia management, and the outcomes of pregnancy alongside child growth patterns within the slum communities across three distinct Boroughs under the purview of the Kolkata Municipal Corporation, encompassing a total of 28 Municipal Wards. Employing a cross-sectional design, this investigation was meticulously crafted to ascertain the prevalence of anaemia among pregnant women, stratifying them based on the severity of their condition within the defined study population. Central to the study's objectives was the exploration of the intricate nexus between anaemia and an array of socio-demographic variables. Embracing a methodologically robust approach, the investigation seamlessly integrated quantitative surveys with qualitative interviews, thus fostering a nuanced understanding of the multifaceted determinants underpinning anaemia prevalence among pregnant women dwelling within the confines of the 28 wards spanning the Kolkata Municipal Corporation.

The quantitative data collection process entailed the systematic administration of Semi Structured Interview Scheduled to pregnant women actively enrolled in the health institution. These surveys meticulously probed into a diverse array of socio-demographic attributes, encompassing variables such as age, education level, household income, and marital status, alongside an exhaustive exploration of access to essential healthcare services, including prenatal care visits and antenatal screening. Furthermore, the surveys delved into intricate details concerning the reception and consumption patterns of iron-folic acid supplements, vital for mitigating the risk of anaemia during pregnancy. Additionally, the survey instruments comprehensively captured crucial data pertaining to the delivery process, including the mode of delivery and any complications encountered, as well as postnatal care practices adopted by the participants. Prior to their participation, each individual involved in the study was provided with a formal consent form, wherein the objectives and procedures of the research were elucidated in detail, ensuring informed consent and ethical compliance throughout the data collection process.

Inclusion and Exclusion Criteria

**Inclusion Criteria:** Throughout the period spanning from January 2023 to December 2023, pregnant women were systematically identified within the slum communities nestled across the 28 Wards spanning three Boroughs under the jurisdiction of the Kolkata Municipal Corporation (KMC). This meticulous identification process was facilitated to ensure comprehensive coverage of the target population. Subsequently, each identified pregnant woman underwent Haemoglobin (Hb) testing, with the assessments conducted and reports procured under the auspices of registered medical practitioners. This stringent protocol was meticulously adhered to in order to ensure the accuracy and reliability of the haematological data obtained, thereby furnishing a robust foundation for the subsequent analyses and insights garnered within the ambit of the study.

**Exclusion Criteria:** Pregnant women who were unwilling to participate and did not have a Haemoglobin (Hb) report were excluded from the study, and women who reported they would relocate/move immediate after delivery or child birth.

**Study Population and Sample Size**

The study cohort encompassed pregnant women hailing from three distinct boroughs under the purview of the Kolkata Municipal Corporation, namely Br-VI, Br-VII, and Br-XV, collectively spanning a total of 28 Wards. These women were identified and enlisted their pregnancies through either government or private institutions offering comprehensive pregnancy care and management services throughout the period spanning from January 2023 to December 2023.
A cohort of 400 pregnant women afflicted with anaemia was meticulously identified and subsequently monitored within the designated timeframe, commencing from January 2023 and concluding in December 2023. Throughout this duration, the researcher conducted face-to-face interviews, employing structured questionnaires meticulously crafted to elicit pertinent information. These interviews were facilitated with the invaluable assistance of a multidisciplinary team comprising physicians, nurses, paramedical personnel, and public health workers, all of whom had undergone a comprehensive one-week training program to ensure standardized data collection protocols.

The data collection process encompassed a comprehensive spectrum of domains, encompassing socio-demographic and economic attributes, reproductive health history, feeding practices, and the intended birthplace preferences of the participants. This exhaustive approach aimed to garner a holistic understanding of the multifaceted determinants underpinning anaemia prevalence among pregnant women within the study population, thereby facilitating informed decision-making and targeted interventions aimed at mitigating the adverse impact of anaemia on maternal and child health outcomes.

Data Collection and Analysis

Data was gathered utilizing a pre-tested and predesigned semi-structured Interview schedule. The researchers gathered sociodemographic information and data pertaining to reproductive behaviour. Socioeconomic status was ascertained in accordance with the poverty line established by Tendulkar's committee, which defined a monthly income of rupee 673 or less as indicative of a low socioeconomic status. An additional detail included in the accessible investigation report is the haemoglobin level, and Iron and Folic Acid received vs consumption.

Health Centres conducted the measurement of the pregnant woman's blood pressure (Government and Private Institutes) The WHO criteria were used to classify anaemia; an HB concentration of less than 11 g/dL was regarded as anaemia. An HB concentration ranging from 7 to 9.9 g/dL, 10 to 10.9 g/dL, and less than 7 g/dL, respectively, was classified as mild, moderate, and severe anaemia. The expectant mothers were provided with guidance regarding their HB levels, as well as the significance of incorporating iron and folic acid tablets, local iron-rich foods, and regular antenatal checkups, among other recommendations.

The data were analysed using IBM SPSS Statistics V20.0 (IBM United States). The quantitative measures are presented by mean and standard deviation and qualitative variables by proportions.

The Chi-square test was conducted to assess any significant associations between anemic pregnant women and various socio-demographic factors. P ≤ 0.05 was considered statistically significant to demonstrate such associations with specific indicators. Additionally, a descriptive analysis was undertaken to determine the prevalence of anaemia, the receipt and consumption of Iron-Folic Acid (IFA), as well as the proportion of screenings conducted to identify anemic pregnant women.

Results

Within the designated timeframe, a total of 400 pregnant women were identified as being afflicted with anaemia, subsequent to undergoing confirmatory haemoglobin tests. Among this cohort of anaemic pregnant women, the majority, comprising 257 individuals, were diagnosed with mild anaemia, constituting approximately 64.25% of the total. Following closely behind, 141 pregnant women, accounting for 35.25% of the cohort, were identified as experiencing moderate anaemia. Additionally, a minority of 2 pregnant women, representing a mere 0.50% of the total, were diagnosed with severe anaemia. These findings underscore the varying degrees of anaemia severity prevalent within the study population, necessitating targeted interventions tailored to address the specific needs of individuals grappling with mild, moderate, and severe forms of anaemia during pregnancy.
Among the cohort of pregnant women classified as having mild anaemia, comprising 143 individuals (representing 70.44% of the group), a majority received a supply of 180 or more iron-folic acid (IFA) tablets. Remarkably, only 23 participants (11.39%) adhered to the prescribed regimen, consuming the recommended IFA tablets as directed. Similarly, within the category of pregnant women diagnosed with moderate anaemia, totalling 74 individuals (comprising 66.07% of the group), a substantial proportion received a supply of 180 or more IFA tablets. However, a mere 7 participants (6.31%) demonstrated adherence to the prescribed regimen by consuming the recommended IFA tablets.

In contrast, the sole pregnant woman identified as experiencing severe anaemia (representing 100% of the group) received the stipulated supply of 180 or more IFA tablets. Regrettably, however, she failed to adhere to the prescribed regimen, as she did not consume the requisite 180 IFA tablets during the entirety of her pregnancy period.
These findings underscore the critical importance of not only providing adequate supplies of IFA tablets but also emphasizing the crucial role of adherence to prescribed medication regimens in effectively managing anaemia among pregnant women, thereby safeguarding maternal and fetal health outcomes.

Table 1. Association of Anaemia with Different Socio-Economic Factors

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Type of Anaemia</th>
<th>χ² (P Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;20</td>
<td>Mild (10 to 10.9 g/dl)</td>
<td>35 (13.6%)</td>
</tr>
<tr>
<td>20-35</td>
<td>Moderate (7 to 9.90g/dl)</td>
<td>106 (75.20%)</td>
</tr>
<tr>
<td>&gt;35</td>
<td>Severe (Below 7 g/dl)</td>
<td>4 (2.80%)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>Mild (5.80%)</td>
<td>9 (6.40%)</td>
</tr>
<tr>
<td>Primary</td>
<td>39 (15.20%)</td>
<td>19 (13.50%)</td>
</tr>
<tr>
<td>Secondary</td>
<td>133 (51.80%)</td>
<td>78 (55.30%)</td>
</tr>
<tr>
<td>HS</td>
<td>59 (23%)</td>
<td>27 (19.10%)</td>
</tr>
<tr>
<td>Graduate and above</td>
<td>11 (4.30%)</td>
<td>8 (5.70%)</td>
</tr>
<tr>
<td>Occupation of Anaemic Pregnant Women</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>10 (3.9%)</td>
<td>3 (2.10%)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>247 (96.10%)</td>
<td>138 (97.90%)</td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hindu</td>
<td>80 (31.1%)</td>
<td>49 (34.80%)</td>
</tr>
<tr>
<td>Muslim</td>
<td>175 (68.10%)</td>
<td>92 (65.20%)</td>
</tr>
<tr>
<td>Christian</td>
<td>2 (0.80%)</td>
<td>0</td>
</tr>
<tr>
<td>Caste</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>247 (96.1%)</td>
<td>138 (97.9%)</td>
</tr>
<tr>
<td>SC</td>
<td>9 (3.50%)</td>
<td>2 (1.4%)</td>
</tr>
<tr>
<td>OBC</td>
<td>1 (0.40%)</td>
<td>1 (0.70%)</td>
</tr>
<tr>
<td>Monthly Family Income</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;10000</td>
<td>176 (68.50%)</td>
<td>95 (67.40%)</td>
</tr>
<tr>
<td>10001-20000</td>
<td>75 (29.20%)</td>
<td>42 (29.80%)</td>
</tr>
<tr>
<td>&gt;20000</td>
<td>6 (2.30%)</td>
<td>4 (2.80%)</td>
</tr>
</tbody>
</table>

Note: * Statistically Significant

The analysis reveals a statistically significant association between the type of anaemia and the age groups of pregnant women, underscored by the Pearson Chi-Square test. Notably, the age group spanning from 20 to 35 years exhibits the highest representation across all categories. Predominantly, individuals falling within the <20 and 20-35 age brackets manifest mild anaemia levels, albeit moderate levels also emerge prominently. Conversely, the >35 age group exhibits the smallest numbers, with only a marginal percentage experiencing mild to moderate anaemia. Of particular concern within the 20-35 age bracket are the two individuals displaying severe haemoglobin levels, warranting further investigation. Overall, the distribution patterns suggest a potential higher prevalence of anaemia within reproductive age groups, particularly among individuals aged 20-35, with a notable proportion showcasing mild haemoglobin levels.

Education level also emerges as a salient determinant, with the majority of individuals across all categories exhibiting mild or moderate haemoglobin levels. Notably, the Secondary education category boasts the highest percentage of individuals with mild anaemia levels, followed closely by the Illiterate and Primary education groups. Intriguingly, the High School education category witnesses the highest percentage of individuals with mild anaemia levels. It's worth noting that individuals surpassing higher secondary education exhibit severe anaemia levels, warranting attention.

Employment status unveils nuanced insights, with a minor percentage of employed pregnant women exhibiting mild or moderate anaemia levels, contrasting with a higher prevalence among the unemployed demographic. Particularly noteworthy is the prevalence of mild and moderate anaemia among
unemployed pregnant women, suggesting a potential need for enhanced healthcare access or interventions within this cohort.

Analysing religious affiliations, a higher percentage of individuals in the Muslim community showcase mild anaemia levels compared to moderate levels. However, severe anaemia cases are not exclusive to any religious group, with two instances identified within the Muslim community. This indicates the pervasiveness of anaemia across both Hindu and Muslim demographics.

Furthermore, an association between anaemia and socioeconomic status is evident, with a majority of individuals with mild to moderate anaemia belonging to low-income families. Notably, severe anaemia cases also stem from low socioeconomic backgrounds, suggesting economic constraints as a significant risk factor. Individuals in the "<10000" income group are particularly susceptible to anaemia, highlighting the imperative for targeted interventions to address economic disparities and mitigate the burden of anaemia within vulnerable communities.

**Discussion**

Anaemia during pregnancy remains a significant health concern in India. Nationally, the prevalence of anaemia among pregnant women aged 15-49 years (<11.0 g/dl) stands at 52.20% (NFHS-5), with the specific rate in West Bengal recorded at 62.3%. The WHO and World Bank jointly identify iron deficiency anaemia as the third leading cause of disability-adjusted life years lost, attributing this to factors such as low socio-economic status, inadequate dietary intake, and poor consumption of iron-folic acid during pregnancy (Sinha, 2021) (R., 2010).

This study unveils that the majority of cases present with mild anemia (10-10.9 g/dl), followed closely by moderate anemia (7-9.9 g/dl), with the highest proportion of hemoglobin screenings occurring at ANC-2. In total, 62.75% of pregnant women exhibit mild anemia, while 32.62% are classified as moderately anemic. In a similar vein, Ravishankar Suryanarayana et al conducted a community-based study, revealing that 41.9% of pregnant women were mildly anemic, with 17.6% falling into the moderate category. Furthermore, Virender P. and team's study found a high prevalence of anemia, showing associations with factors such as age, family income, religion, caste, education, and birth interval (Stephen, 2018).

Despite this, a discernible trend of inadequate consumption of iron-folic acid (IFA) during pregnancy persists, potentially leading to severe anemia. Numerous studies have underscored poor IFA intake as a primary contributor to anemia. For instance, a study conducted at a rural medical college in West Bengal noted a significant majority of women failing to adhere to proper IFA tablet regimens. Within this context, it was observed that IFA tablet consumption was notably low. Mildly anemic mothers consumed 29.35% of the prescribed IFA tablets, even though they were provided with 71.13% of the tablets. On the other hand, moderately anemic mothers consumed merely 22.78% of the recommended IFA tablets, despite receiving 65.83% of the supply. The multifaceted nature of anemia includes various factors, with low consumption of IFA tablets emerging as a major concern. This issue results from a combined effect of insufficient stocks and poor demand, driving the prevalence of anemia among pregnant women (Stephen, 2018) (Sununtnasuk, 2016).

Naila Baig-Ansari et al., Merza et al. and Grace Stephen et al. revealed in their study that prevalence of anaemia mostly common among house-wife, lower education level significantly associated with anaemia (Tolentino, 2007). This study also revealed that prevalence of anaemia is common among pregnant women those are unemployed and family income is below 10000/-, where as those who completed secondary education prevalent of anaemia is more among them (Varghese, 2019) (Viveki, 2012).

A significant association found between age of pregnant women and anaemia among them and mostly 20-35 years of age of pregnant women are more vulnerable to develop anaemia. Similarly, R.G.Viveki et al. revealed in the study that between 22-25 and more than 26 years age of pregnant women are more vulnerable to develop anaemia and there is significant association present between age of pregnant women and anaemia (Suryanarayana, 2017).
In the 28 wards of Kolkata's urban slum areas, a regular attendance of mothers at meetings has been noted, where discussions span topics such as nutrition, family planning, various government schemes, immunization, and different healthcare services. Despite this proactive engagement, the prevalence of anemia among pregnant women remains a significant concern.

Factors contributing to this challenge include the region's low socio-economic status, limited family income, lower levels of education, instances of early pregnancy, poor dietary patterns, inadequate consumption of IFA, pregnancies exceeding gravida three, and birth spacing less than three years. Interestingly, while mothers do receive IFA supplements, the issue of consumption persists. Reasons cited include the unpleasant taste of the supplements, prevalent myths surrounding their use, concerns about constipation, and a general lack of self-awareness. These factors often lead to intentional or unintentional forgetting to consume the provided supplements, further complicating efforts to combat anemia in this demographic. Maternal anemia continues to be alarmingly common in developing nations, while the proportion of women who take one or more iron and folic acid (IFA) tablets during pregnancy remains consistently inadequate (Sarala, 2020). William Joe et al. noticed one study that after implementation of “Anaemia Mukt Bharat” strategy the IFA supplementation increased and other micronutrient such as B12, Folic acid also needed for reduction of anemia and now supply has been increased for this (Joe, 2022) (Toteja, 2006).

Conclusions

In summary, the prevalence of anaemia during pregnancy persists at concerning levels, with its occurrence intricately linked to demographic factors such as age, family income, occupation, and access to healthcare services. These disparities underscore the multifaceted challenges faced by pregnant women in navigating their health and well-being. While anaemia correlates with the consumption of iron-folic acid supplements, disparities between supply and demand within healthcare facilities pose significant barriers to effective management. This study sheds light on the urgent need for policymakers to devise and implement targeted interventions, bolstering healthcare services and addressing underlying socioeconomic determinants to mitigate the burden of anaemia among pregnant women and lactating mothers. By informing policy formulation and strategic planning, these insights hold the potential to catalyze meaningful change and improve maternal and child health outcomes. In conclusion, concerted efforts are essential to combat anaemia during pregnancy effectively, ensuring the well-being of both mothers and their offspring.

Recommendation

The following recommendations are derived from the research to prevent or reduce the severity of anaemia in pregnant women:

- Initiated by the Ministry of Health and Family Welfare (Government of India), the "Anaemia Mukt Bharat" initiative targets six beneficiary groups, including nursing mothers and pregnant women (0-6 months). Pregnant individuals should commence daily iron supplementation in the fourth month of pregnancy, with a recommended duration of 180 days throughout pregnancy and an additional 180 days after delivery.

- An immediate demand exists to enhance awareness campaigns, screening initiatives, and the availability of treatment options for anaemia. It is imperative that routine screening and testing be implemented not only in Urban Primary Health Centres (UPHCs), but also in diverse health facilities.

- Adolescent girls, in particular, should be educated about the impending problem if they are not attended to as early as that age.

- It should be encouraged that women of childbearing age take the necessary supplements before conception and continue doing so.
The male partner's education regarding the potential complications of the disease and the benefits of a supplemented diet during pregnancy could be of great assistance to the pregnant woman in incorporating these practices into her daily routine.

For the purpose of supplementation support, food fortification with vital vitamins and minerals may be effective. Iron fortification can be implemented in everyday foods such as sugar and salt in order to increase iron stores; such products should be readily available and affordable to the general public. The use of cast iron utensils for cooking food has the potential to mitigate the severity of anaemia.

According to the World Health Organization (WHO), it is imperative for all nations to be cognizant of the gaps in coverage and quality of care within their healthcare systems. Additionally, countries must pinpoint disparities in coverage based on geographic location, ethnic composition, and income levels. Taking proactive measures to address these inequalities is essential in ensuring the realization of Universal Health Coverage for all (World Health Organization, 2010) (World Health Organization, 2011).

It is imperative to develop advertising campaigns that capture the interest of policymakers, given that anaemia stands as a significant global concern.

**Limitation**

The study was carried out within an urban slum area in Kolkata, highlighting a significant challenge: the pronounced tendency of high migration among slum residents. Adding to this hurdle, the unavailability of essential haemoglobin testing kits at the Urban Primary Health Centre (UPHC) further complicates access to necessary healthcare services. Moreover, the study revealed issues with reporting, particularly in the form of incomplete or inaccurate data. These factors collectively impede efforts to accurately assess healthcare coverage, thus presenting challenges in devising effective intervention strategies.

**Conflict of interest**

The authors declared that there is no conflict of interest regarding this study procedure.

**References**


