



## A PORTRAYAL OF THE SOCIODEMOGRAPHICS AND OPTIMAL UPTAKE OF ANTENATALCARE SERVICES AMONG PREGNANT WOMEN OF URBAN SLUMS IN INDIA: AN INITIAL DATASET DEPICTION

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**Article History**

Received: 08 July 2023

Revised: 15 Sept 2023

Accepted: 12 Oct 2023

**Abstract**

**Background:** Escalating deployment of maternal healthcare services has considerably impacted maternal mortality rates. However, urban slums have remained an understudied area in this context.

**Aim:** To assess maternal healthcare service utilization patterns and influencing factors during antenatal period in urban slums. The analysis encompasses Fertility, Family Planning Practices, Dietary Habits, Health Quality, and implications of COVID-19 on Pregnancy.

**Method:** Cross-sectional research conducted between April and June 2022, among urban slums in South Delhi, targeting pregnant women aged 18-44 years. Data from 250 ongoing pregnancies, accessed through Aganwadi centers, were collected electronically following study protocol.

**Result:** Results indicated that 98% of participants were under 40 years of age, with 67% falling below 28 years. About 93% of sample population was educated, with 93% as homemakers. Among women with parity, 82% had one child. Awareness of ANC was widespread, with 78% demonstrating medium level of knowledge. Media exposure and family planning adoption were minimal (47% and 51%, respectively). ANC utilization rates were high, with 98%, 97%, and 94% receiving iron and folic acid, tetanus toxoid, and ultrasound examinations, respectively. Only 2% were exposed to COVID-19 during pregnancy.

**Conclusion:** This initial investigation indicates low media exposure and family planning adoption. However, ANC awareness and utilization were significant. Strategies should prioritize women's education to enhance awareness of ANC and postnatal care. Strengthening public health infrastructure is vital for optimizing maternal service utilization.

**Keywords:** maternal health, slum dwellers, south Delhi, pregnant women, urban

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**Introduction:**

The significance of maternal healthcare as a topic has gained widespread recognition and is considered a crucial global issue within the realm of health system worldwide. Despite of noticeable plummet in the graph of global maternal mortality rate during 2000 to 2017 by 38%<sup>1</sup>, an unacceptable incidence of maternal death continues to linger around in high numbers for Lower-middle-income countries, displaying the gaps observed in accessing quality health care services around the world. In reference to World Health Organization (WHO), the total number of deaths observed in women due to pregnancy related complications in the year 2017 was observed to be around 229 thousand<sup>2</sup>. In India, even

though a compelling decrease was seen in maternal mortality rate (MMR) from 370 to 145 per 1,00,000 live births (During 2000-2017), the country still reports 20% of the world's maternal mortality<sup>1</sup>. Further, to avert maternal mortality a new strategy called Sustainable Development Goals (SDG) was adopted in a bid to dwindle the global MMR to less than 70 per 1,00,000 live births by 2030<sup>2</sup>.

Preceding studies state that insufficient utilization of maternal and child health care services play a major role in contribution of maternal mortality<sup>3,4</sup>. These maternal deaths can be staved off by providing access to quality ANC services<sup>5,6</sup>. Correct application of ANC counts on numerous crucial factors like the age of child marriage, the financial situation of household and the education level of women. Additionally, a systematic review has found out various factors stating ANC utilization, residence, age, number of children born, level of education, employment situation, marital status and religious considerations<sup>7,8</sup>. Since India being a developing country, it is devoid of access to Ante-Natal Care. A study revealed that 51% of women completed four or more visits, while only 21% received comprehensive ANC (Antenatal Care) Services<sup>9</sup>. A big difference was observed between developed (98%) and low-income (68%) countries for ANC coverage<sup>10</sup>. The persistent difference in health systems underlines the necessity for universal equality in ANC (Antenatal Care) worldwide.

The maternal mortality rate is significantly affected by the utilization of maternal healthcare services. While there are numerous studies that investigate demographic and socio-economic factors and other discrepancies in service distribution and usage between rural and urban areas, there is a lack of research focusing in urban slums. With respect to this background, our study is aimed at exploring the patterns and factors influencing the utilization of maternal healthcare services during the antenatal period of urban slums. This included examining of fertility rates, family planning practices, dietary habits, healthcare quality and the impact of COVID-19 on pregnancy.

## **Methods:**

**Study Settings:** The study was managed in four urban slums of South Delhi, during the period of April and June 2022 amidst the pregnant women (aged between 18-44 years). The source of data collection was from Anganwadi Centres. The comprehensive methodology used in the study was derived from the article outlining the study protocol<sup>11</sup>. The name of the 4 study sites are Dakshinpuri, Khanpur, Madangir, And Pushp Vihar which are considered to be the major hub of urban slums in South Delhi.

**Study Population:** The study sample are the pregnant women visiting Anganwadi Centres, they were approached for participation in this survey after collecting a written consent from them. The main objective of this survey was to find out the study site estimates of fertility, Family planning practices, dietary practices and utilization of maternal health services during the antenatal period. In addition to that, the survey also covers data concerning healthcare quality and the effects of COVID-19 on pregnancy, offering insights into the women's status, reproductive health and various Socio-Demographic factors.

**Sample Size:** The sample size of the baseline data includes 250 currently pregnant women. But the original sample size with respect to the study protocol was planned to be around 225<sup>11</sup>. The rationale behind arriving to this figure of sample size was that very limited number of studies were reported in antenatal care utilization in the urban slums of Delhi. Taking the indicator of Urban Delhi as a point of reference, and with an anticipated proportion of 30% for complete ANC (at least four ANC visits), the study aimed to achieve a 95% confidence levels and an absolute precision of 6%. Due to the pressure of dropout faced during follow-up of pregnancy outcomes, the additional 25 participants were involved in the study.

**Data Collection:** The mechanism of data collection was drawn from National Family Health Survey 5<sup>th</sup> round which is a multi-round, large-scale survey conducted among the representative sample of households occupying more than 99% of the population throughout India. An in-house built App based android application platform, SOMAARTH (developed by the INCELN Trust International- IN) was used for collecting the data my electronic means.

**Statistical analysis:** The e-data were analyzed using SPSS tool.

**Results:**

Within the sample size of 250 pregnant women, 81(98%) were found to be less than 40 years of age and 169 (67%) were below 28 years of age. Out of the mentioned sample size a large chunk of population (55.6%) hail from Scheduled Tribes (ST) caste and are Hindus (87.6%). Further, it was intriguing to note that (94.4%) are having their permanent residing address (Residing for more than 6 months). In addition, out of the mentioned lot, 93% of the sample population are educated and 23% among them are graduates. With respect to their occupancy, 93% (234) were homemakers while the rest of the sample were engrossed in other occupations. Out of the 250 women surveyed, 54% had experienced childbirth, with 82% of those women having only one child. Additionally, over half of these women were following mixed diets (71.2%) (Table 1).

**Table 1: Demographics of pregnant women (N=250)**

Variables	Frequency	Percentage
<b>Age (N=250)</b>		
18-28 years	169	67.6
29-39 years	79	31.6
>40 years	2	0.8
<b>Social Group (N=250)</b>		
General	87	34.8
OBC	19	7.6
ST	139	55.6
SC	3	1.2
Don't know	2	0.8
<b>Religion (N=250)</b>		

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Christian	3	1.2
Hindu	219	87.6
Muslim	27	10.8
Sikh	1	0.4
Buddhist/Neo- Buddhist	0	0
Jain	0	0
Jewish	0	0
Parsi/Zoroastrian	0	0
No religion	0	0
<b>Residential status (N=250)</b>		
Inmigrated due to change or shift of house	2	0.8
Inmigrated for education	0	0
Inmigrated due to marriage	0	0
Inmigrated due to employment	10	4
Others/Don't know	2	0.8
Permanent (Staying for more than 6 months)	236	94.4
<b>Education (N=250)</b>		
Profession or Honours	10	4
Graduate	58	23.2
Intermediate or diploma	38	15.2
High School Certificate	48	19.2
Middle School Certificate	45	18
Primary School Certificate	33	13.2
Illiterate	18	7.2
<b>Participant Occupation (N=250)</b>		
Elementary	4	1.6
Service/Sales/Shop	12	4.8
Homemaker	234	93.6
<b>Child bearing women (N=250)</b>		
Yes	135	54
No	115	46
<b>If Yes, number of children (excluding current pregnancy) (N=135)</b>		
One	111	82.2
Two	2	1.5
Three	20	14.8
More than three	2	1.5
<b>Urban Slums Covered (N=250)</b>		
Dakshinpuri	120	48.0
Khanpur	18	7.2
Madangir	78	31.2
Pushp Vihar	34	13.6

Type of Diet		
Mixed	178	71.2
Non-vegetarian	1	0.4
Pure vegetarian	71	28.4

Table 2 projects the profession of their Spouse/Fathers. Among them most are working as service employees or shop/market sales workers (80%). At the time same time all the respondents were aware about the antenatal care services, among whom 2.8% showed high of knowledge and the majority (78%) had a range of medium level of knowledge. With respect to Media only 118 (47%) number of women had access to media and 51.2% embraced alternative forms of family planning. Among the pregnant women all received antenatal care (ANC) (100%), 98.4% expressed about easy access of ANC services. Around 97.2% and 98.8% were given tetanus toxoid and iron folic acid tablets during the tenure of their pregnancy. During the current pregnancy, 94.4% of the women underwent ultrasound examinations, and an overwhelming 99.2% experienced a complication-free-pregnancy. Merely two individuals encountered the issue of high blood pressure. It was disheartening to report that about 85.6% of the sampled population's last pregnancy resulted in abortion (Table 2).

**Table 2: Availing maternal health services in relation to knowledge assessment of mothers**

Parameters*	True cases (in number)	Percentage (%)
<b>Husband/Father Occupation (N=250)</b>		
Legislator, Senior Official or Manager	1	0.4
Professionals	3	1.2
Technicians and Associate Professionals	1	0.4
Clerks	1	0.4
Service workers and Shop and Market Sales Workers	200	80
Skilled Agricultural and Fishery Workers	2	0.8
Craft and Related Trade Workers	0	0
Plant and Machine Operators and Assemblers	0	0
Elementary Occupation	33	13.2
Unemployed	9	3.6
<b>Knowledge about Maternal healthcare services (N=250)</b>		
Poor	47	18.8
Medium	196	78.4
High	7	2.8
<b>Any exposure to media information? (N=250)</b>		
Yes	118	47.2
No	132	52.8
<b>Contact with Female Community Health Volunteer (FCHV) (N=250)</b>		

Yes	202	80.8
No	48	19.2
<b>Is ANC easily accessible? (N=250)</b>		
Yes	246	98.4
No	4	1.6
<b>If “Yes”, how far is ANC located from your home location? (in kms) (N=250)</b>		
Less than 2 kms	217	88.4
2-5kms	29	11.6
More than 5kms	0	0
<b>Is necessary information provided by ANC? (N=250)</b>		
Yes	249	99.6
No	1	0.4
<b>Family Planning Adopted (any form) (N=250)</b>		
Yes	128	51.2
No	122	48.8
<b>Have you ever visited Anganwadi for antenatal services? (N=250)</b>		
Yes	250	100
No	0	0
<b>Did you ever receive Tetanus Toxoid (TT) injections? (N=250)</b>		
Yes	243	97.2
No	7	2.8
<b>Did you ever receive Iron Folic Acid? (N=250)</b>		
Yes	247	98.8
No	3	1.2
<b>Ultrasound test done during this pregnancy (N=250)</b>		
Yes	236	94.4
No	14	5.6
<b>Was/is there any complication during antenatal period? (N=250)</b>		
Yes	2	0.8
No	248	99.2
<b>Type of complications (N= 2)</b>		
Antepartum haemorrhage	0	0
Intrauterine death	0	0
Intra uterine growth retardation	0	0
Oligohydramnios	0	0
Increase in blood pressure	2	100
Increase in blood glucose	0	0
Other	0	0
No complications	0	0
<b>Last pregnancy resulted in abortion (N= 250)</b>		
Yes	36	14.4



No	214	85.6
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*\*Variables adopted from study tools for analysis*

It was also noticed that the large size of the sample population has received COVID-19 vaccination (92.4%) and a meagre 2 (15.2%) women had exposure to COVID-19 during their pregnancy tenure (Table 3).

**Table 3: Status of COVID-19 infection and its vaccination among participants**

Parameters	True Cases (in numbers)	Percentage (%)
<b>Past COVID infection during pregnancy (N=13)</b>		
Yes	2	15.4
No	11	84.6
<b>COVID vaccination received (any dose) (N=250)</b>		
Yes	231	92.4
No	19	7.6

**Discussion:**

India embodies vast diversity in terms of geography, languages, cultural practices, and social norms. As a developing nation, it contributes significantly to the global count with 27 million annual births<sup>12</sup>. Within its population, approximately 26% comprises women aged 15 to 49 years<sup>13</sup>. These women face various risks during pregnancy, impacting maternal mortality and morbidity rates. However, the implementation of quality Antenatal Care (ANC), skilled birth attendants, and appropriate postnatal care can mitigate these concerns.

Antenatal care not only enhances maternal health but also plays a pivotal role in reducing maternal mortality and morbidity rates. This study highlights the high utilization of ANC services by pregnant women in urban slums, and the majority exhibited awareness of ANCs. This finding diverges from Tessema ZT et al discovery of low recommended ANC utilization (58.53%) in Sub-Saharan Africa<sup>14</sup>. In Uttar Pradesh, 83% and 61% of women utilized some form of ANC, with at least three visits during pregnancy<sup>15</sup>. Contrasting national data from the National Family Health Survey (NFHS)-4 indicates that only 21% of pregnant women received ANC, with half completing the recommended three visits<sup>9</sup>. Notably, our study's urban slum focus differs from other studies in Ethiopia (63.77%)<sup>5</sup>, Liberia (76.13%)<sup>16</sup>, Ghana (86%)<sup>17</sup>, and Angola (82.5%)<sup>18</sup>, possibly due to the distinctive demographics. Prior research also affirms that urban women exhibit higher odds of ANC utilization<sup>7</sup>. India's urban-rural healthcare utilization disparity is widely acknowledged, with rural areas lagging behind. In the survey conducted in six states among the women aged 15-24 years revealed that the percentage of utilizing maternal and child healthcare services is comparably lower in rural areas (47%) compared to urban (78%)<sup>19</sup>. To address such gaps, Government of India (GOI) launches some programmes specific to maternal and child health. Initiatives like the National Rural Health Mission (NRHM) and Janani Suraksha Yojana (JSY) have improved institutional deliveries from 18% in 2008 to 80% in 2018<sup>20</sup>. In addition to the NRHM, the Government of India introduced the National Urban Health Mission in 2008, along with the Reproductive, Maternal, Newborn, Child, and Adolescent Health (RMNCH+A) program in



2013, both aimed at improving maternal health. Despite these initiatives, the most prominent healthcare disparity in India continues to be the unequal access to healthcare services between rural and urban areas.

The Reproductive and Child Health (RCH) initiative, launched as part of the National Health Mission (NHM), aimed to facilitate a minimum of three prenatal examinations, encompassing vital sign assessment, localized abdominal examination, tetanus immunization, distribution of iron and folic acid tablets, and treatment for anemia<sup>21</sup>. Our study found that during pregnancy, 97.2% and 98.8% of participants received tetanus toxoid and iron-folic acid tablets, respectively. In contrast, the proportion of women consuming iron-folic acid tablets was markedly lower in a study conducted in rural Uttar Pradesh (7.9%)<sup>15</sup>, as well as according to the NFHS-4 data (10.9%) for rural UP<sup>9</sup>. Notably, the national figure provided by NFHS-4 is slightly higher (25.9%)<sup>9</sup>. Furthermore, 94.4% of women underwent ultrasound examinations during their current pregnancy in our study, whereas the Annual Health Survey reported percentages of antenatal investigations—such as blood pressure, haemoglobin measurement, and ultrasound—as 35%, 27%, and 31%, respectively<sup>22</sup>. This preliminary research suggests that media exposure among pregnant women was limited. Tessema ZT et al study indicated that women exposed to mass media had higher odds of adhering to recommended ANC utilization compared to those without such exposure<sup>14</sup>. Similarly, Ali and Chauhan concluded that exposure to mass media positively correlates with ANC service utilization<sup>23</sup>. Research in various Indian states also found higher full ANC utilization rates among young mothers with any form of media exposure<sup>24,25</sup>. Corresponding results were observed in studies conducted in Bangladesh<sup>26</sup> and Nepal<sup>27</sup>. It is widely acknowledged that mass media has the potential to disseminate knowledge to a wide audience simultaneously.

Despite high ANC visits, family planning adoption remained low in our study. Planned pregnancies positively correlated with recommended ANC visits<sup>14</sup>. The Reproductive and Child Health (RCH) initiative, launched as part of the National Health Mission (NHM), aimed to facilitate a minimum of three prenatal examinations, encompassing vital sign assessment, localized abdominal examination, tetanus immunization, distribution of iron and folic acid tablets, and treatment for anemia<sup>21</sup>. Our study found that during pregnancy, 97.2% and 98.8% of participants received tetanus toxoid and iron-folic acid tablets, respectively. In contrast, the proportion of women consuming iron-folic acid tablets was markedly lower in a study conducted in rural Uttar Pradesh (7.9%)<sup>15</sup>, as well as according to the NFHS-4 data (10.9%) for rural UP<sup>9</sup>. Notably, the national figure provided by NFHS-4 is slightly higher (25.9%)<sup>9</sup>. Furthermore, 94.4% of women underwent ultrasound examinations during their current pregnancy in our study, whereas the Annual Health Survey reported percentages of antenatal investigations—such as blood pressure, haemoglobin measurement, and ultrasound—as 35%, 27%, and 31%, respectively<sup>22</sup>. This preliminary research suggests that media exposure among pregnant women was limited. Tessema ZT et al's study indicated that women exposed to mass media had higher odds of adhering to recommended ANC utilization compared to those without such exposure<sup>14</sup>. Similarly, Ali and Chauhan concluded that exposure to mass media positively correlates with ANC service utilization<sup>23</sup>. Research in various Indian states also found higher full ANC utilization rates among young mothers with

any form of media exposure<sup>24,25</sup>. Corresponding results were observed in studies conducted in Bangladesh<sup>26</sup> and Nepal<sup>27</sup>.

Women's level of education plays a crucial role in influencing the adoption of ANC, as educated mothers tend to possess higher awareness regarding the importance of ANC and are more likely to engage with healthcare facilities<sup>28</sup>. Our study revealed that approximately 93% of the sample population were educated, and nearly all of them availed ANC services. Numerous Indian studies have corroborated the notion that a mother's education significantly impacts the likelihood of ANC utilization<sup>29</sup>. A research effort conducted by Singh PK et al focusing on rural adolescent women in India underscored that those with higher education were three times more inclined to utilize ANC services compared to their counterparts<sup>30</sup>. Higher educational attainment empowers women to communicate effectively and assert their stance within their families. It also fosters a sense of self-worth, a factor crucial in driving changes in health-related behaviors<sup>30</sup>.

The number of children a woman has also influences her ANC utilization. In our study, the majority of women had only one child (82%), indicating a favourable ANC utilization among them. Research has indicated an inverse relationship between birth order and ANC utilization, with higher birth orders corresponding to lower utilization rates<sup>38</sup>. Likewise, other studies have found that ANC utilization tends to decrease as birth order increases, with the first birth typically associated with higher ANC utilization than subsequent births<sup>4,30</sup>.

Certain limitations need consideration, including the cross-sectional nature of our study and the absence of data pertaining to cultural practices. Furthermore, the study's findings are specific to women residing in urban slums, making it challenging to generalize these findings to broader women's groups.

### **Conclusion:**

In conclusion, India's rich diversity, substantial population, and developmental context emphasize the significance of effective maternal healthcare. While the study underscores high ANC utilization among urban slum pregnant women, the contrast with global trends highlights potential success stories. Initiatives like the National Rural Health Mission and Janani Suraksha Yojana have made strides, yet persistent rural-urban healthcare discrepancies remain. Efforts to improve ANC awareness, media exposure, and family planning adoption are crucial. Education emerges as a vital factor, empowering women to engage with healthcare facilities and positively influencing maternal health behaviors. Birth order also affects ANC utilization. Nevertheless, the study's specific focus and limitations call for cautious generalization.

### **Ethics approval and consent to participate:**

The academic research investigation was granted ethical clearance by DIT University's Research Ethics Committee in Dehradun, India, on July 4th, 2021. Prior to data collection, informed consent was obtained from all eligible participants.

### **Authors' Declaration:**

The preprint of the current research study has been published elsewhere in ResearchSquare (<https://doi.org/10.21203/rs.3.rs-3042826/v1>). It is to declare that this paper is neither submitted nor published in any other journal since the publication of preprint. However, in consultation with all co-authors, the content of the entire manuscript has been paraphrased keeping the data table and references in its original form to avoid plagiarism.

**Financial Support:** Nil

**Conflicts of interest:** Nil

### **Abbreviations:**

ANC - Antenatal Care

MMR - Maternal Mortality Rate

NFHS - National Family Health Survey

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