

# Developing a group Model of ANC-PNC through human-centered Design (HCD) to Improve MNCH of first-time Mothers (FTMs) in Bangladesh

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## Abstract:

**Objective:** First-time parenthood is a complex and emotional journey. The gap between demand and quality services for maternal, newborn and child health (MNCH) and family planning (FP) are significant. Lack of time, awareness, and social support are critical challenges of meeting the service requirement for the young and first-time mothers, especially working mothers in urban areas. Objective of the study was to design an intervention model for the young pregnant women and their partners for improving the quality and use of MNCH and FP services and information.

**Methods:** Using a human-centered design (HCD) approach, we conducted 27 in-depth interviews, 10 focus group discussions, and eight mock sessions with first-time mothers, partners, family members, community influencers and service providers in Tongi, Gazipur. During phase 1, we explored the current realities of life and experience of services, both ideal and existing, from perspectives of a diverse set of stakeholders including both health care providers and care seekers. During phase 2, we designed, tested, and iterated the “group model” of antenatal Care through a series of mock sessions, interviews and consultation with service providers and authorities. We recorded, transcribed, and translated the data for collaborative synthesis and analysis process to generate insight and opportunities for optimizing service delivery and uptake.

**Results:** The study findings spoke for the need of providing group sessions for first time parents, social support from peers and family members and capacity development of the service providers. After careful consideration of the stakeholder needs and preferences, the national guidelines and the local implementing partner’s available resources, we arrived at the recommended group model inclusive of five Group Antenatal Care (GANC) and two group Postnatal Care (GPNC) for mothers. All the pregnant women underwent through clinical check-ups by medically trained professionals, mainly midwives and doctors. The group model also includes two GANC and one GPNC for fathers, as well as informative sessions for companions. The prototype model included five GANC and two GPNC sessions for mothers, two GANC and one GPNC session for fathers, and informative sessions for companions. The sessions included pregnant women of close gestational age, use of visual aids to support session facilitation, and activities to support group bonding and information retention.

**Conclusions:** The Group Model offering 5 ANC and 2 PNC for women, 2 GANC and 1 GPNC for male partners, and sessions for caregivers was developed in line with the national and WHO recommendation. This model found a feasible approach that involved partners and caregivers in the process and increased MNCH and social support during the voyage of the pregnancy journey.

**Keywords:** Antenatal care (ANC); Postnatal care (PNC); Maternal, Newborn, and Child Health (MNCH); Group Antenatal Care (GANC); Group Postnatal Care (GPNC); Human-centered Design (HCD); First-time mothers (FTMs); First-time fathers.

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### **Introduction:**

Delivering maternal, newborn, and child health (MNCH) and family planning (FP) services in the densely populated urban slums is challenging even under the best circumstances. Tongi is an underserved urban township in Gazipur, Bangladesh. This is further exacerbated in Tongi by deep gender inequities, high rates of child marriage and adolescent fertility, lack of knowledge of reproductive health, and low levels of awareness of service availability, especially among young people.<sup>1,2</sup>

Adolescent girls and young women (under 24 years of age) are at high risk of complications during pregnancy. They are more likely to experience postpartum hemorrhage, prolonged obstructed labor, obstetric fistula, and malnutrition, and their infants are also more likely to have poor health outcomes<sup>3</sup> Young women are often impacted by the secondary effects of early pregnancy, such as missed education and higher levels of lifetime fertility. Young married adolescents are especially vulnerable; their relatively limited freedom and their lack of power and autonomy hamper their access to health services, and to education and economic opportunities.

While significant progress in reproductive, maternal, newborn and child health (RMNCH) has been made in Bangladesh over the past twenty years, many challenges still exist. Between 2001 and 2010 the maternal mortality ratio (MMR) decreased from 322 to 194 per 100,000 live births. Furthermore, the Bangladesh Directorate of General Health Services reported an MMR of 140 per 100,000 live births in 2020.<sup>4</sup> Progress in the declining MMR can mostly be attributed to better care-seeking practices, and improved access to higher-level care, as well as improvements in women's education and employment, income, and access to information. However, additional efforts are necessary to further decrease the MMR and improve RMNCH outcomes.

Some contributing factors include the fact that Bangladesh has the fourth-highest rate of child marriage in the world: 52% of girls are married by their 18th birthday and 18% by the age of 15. Bangladesh also has a high adolescent birth rate; 113 out of every 1,000 women ages 15-19 years old have given birth, and 28% of Bangladeshi women begin childbearing within 15 to 19 years of age.<sup>5,6</sup> Early childbearing is associated with various adverse maternal health outcomes.

Another contributing challenge is ANC coverage. To monitor the status of pregnancy, identify complications associated with the pregnancy, and prevent adverse pregnancy outcomes, ANC provided by medically trained providers are essential. In addition, early ANC attendance also lends itself to promoting skilled attendance at birth as well as healthy postnatal behaviors such as breast-feeding and planning for optimal pregnancy spacing. Based on the BDHS 2017-2018, 82% of women received at least one ANC visit from a medically trained provider. Fifty-two percent of mothers and children received PNC from medically trained providers within two days of birth, which has increased since 2014. Nonetheless, disparities in ANC coverage rates continue to exist in urban areas and rural areas (89.8% in urban areas and 79% in rural areas), as well as among different socioeconomic groups (63.6% in the lowest quintile and 97.2% in the highest quintile).<sup>7</sup>

Coverage of four or more ANC visits is another important barrier in ensuring MNCH. The recent BDHS found that only 47% of women received four or more ANC visits from medically trained providers.<sup>5,6</sup> Healthcare throughout the pregnancy journey is crucial, requiring available, high quality, responsive care and focusing on the provision and experience of care. Taking all these challenges into account, the HCD process aims to design a group intervention model to improve uptake of services and ultimately improve RMNCH outcomes. To address these issues, a group model of ANC-PNC was developed using a formative research based HCD approach.

### **Methods:**

The group model was developed using a participatory HCD approach with qualitative research methods. The design process (study) was done in two separate stages: I) formative research for design and II) prototype testing and model development.

The HCD methodology is a holistic approach that utilizes collaborative co-creation methods and a human-centered focus to collect inspiration from and design with the people affected by a problem or involved in its solution. HCD can work within the local context and its constraints and gain insights and inspiration from people's lived experiences. It considers every moment of interaction as an opportunity to improve the experience and

effectiveness of a product or service and it involves diverse stakeholders throughout the process, from beginning to end. *Figure SEQ Figure 1\* ARABIC 1: Overview of HCD Process*

In 2016, a GANC model was developed in Uganda by applying HCD methods with communities in Mbale and Bududa, Uganda. The model was later contextualized, customized, and applied in Kenya (2017) and Guatemala (2019).<sup>8</sup> Using the previous learnings, MSH initiated designing a GANC-GPNC model for young first-time mothers in Tongi in 2021.<sup>9</sup>

Prior to conducting field-based research sessions with users, rapid desk research was carried out to gain a better understanding of the context and the target population. Contextual knowledge of service delivery among the intended groups, experience of BRAC was also considered, especially to learn about the reality of the lives of adolescent mothers in urban settings. Scope, BRAC, and MSH jointly refined the initial research questions, areas of inquiry, and participant profiles. Primary data collection was done by the BRAC project implementation team, with guidance from Scope to develop BRAC's staff capacity in the HCD process and qualitative data collection methods.

### Phase 1: Research

To explore the current reality of life, especially the experience of services from the perspectives of first-time pregnant women, recent first-time parents, community influencers, and facility- and community-based ANC and PNC providers, formative research was conducted. To stimulate richer dialogue and insight generation, a set of design research tools was created, consisting of service journey maps, picture cards, and facilitation prompts.

Altogether, 19 information-gathering sessions were carried out, including 11 in-depth interviews and 8 focus group discussions. In these 19 sessions, a total of 52 respondents, including pregnant women and recent mothers, first-time fathers, representatives from the community, and healthcare providers were interviewed. Table 1 provides the details of all formative research participants.

After data collection, transcription, and translation, a collaborative research synthesis process followed. The data was systematically organized and analyzed to determine emerging themes, which were then jointly reviewed to generate insights and opportunities for optimizing service delivery.

**Table-1**  
*Methods used and participants involved in formative research*

Method	Participants
Focus Group Discussions on Current Realities	Recent first-time mothers First-time pregnant women Recent first-time fathers Shasthya Shebikas (female community health volunteers [CHVs]) Shastya Kormis (CHV supervisors)
In-Depth Interviews on Current Realities	Recent first-time mother with 4+ ANC visits Recent first-time mother with 0 ANC visits First-time pregnant women (2 interviews) Recent first-time father Midwives (2 interviews) Shasthya Shebikas (CHVs) Shastya Kormis (CHV supervisors) Leader of women's group Member of a local MNCH Committee
Focus Group Discussions on Ideal Experiences	First-time pregnant women Recent first-time mothers Shastya Kormis (CHV supervisors)

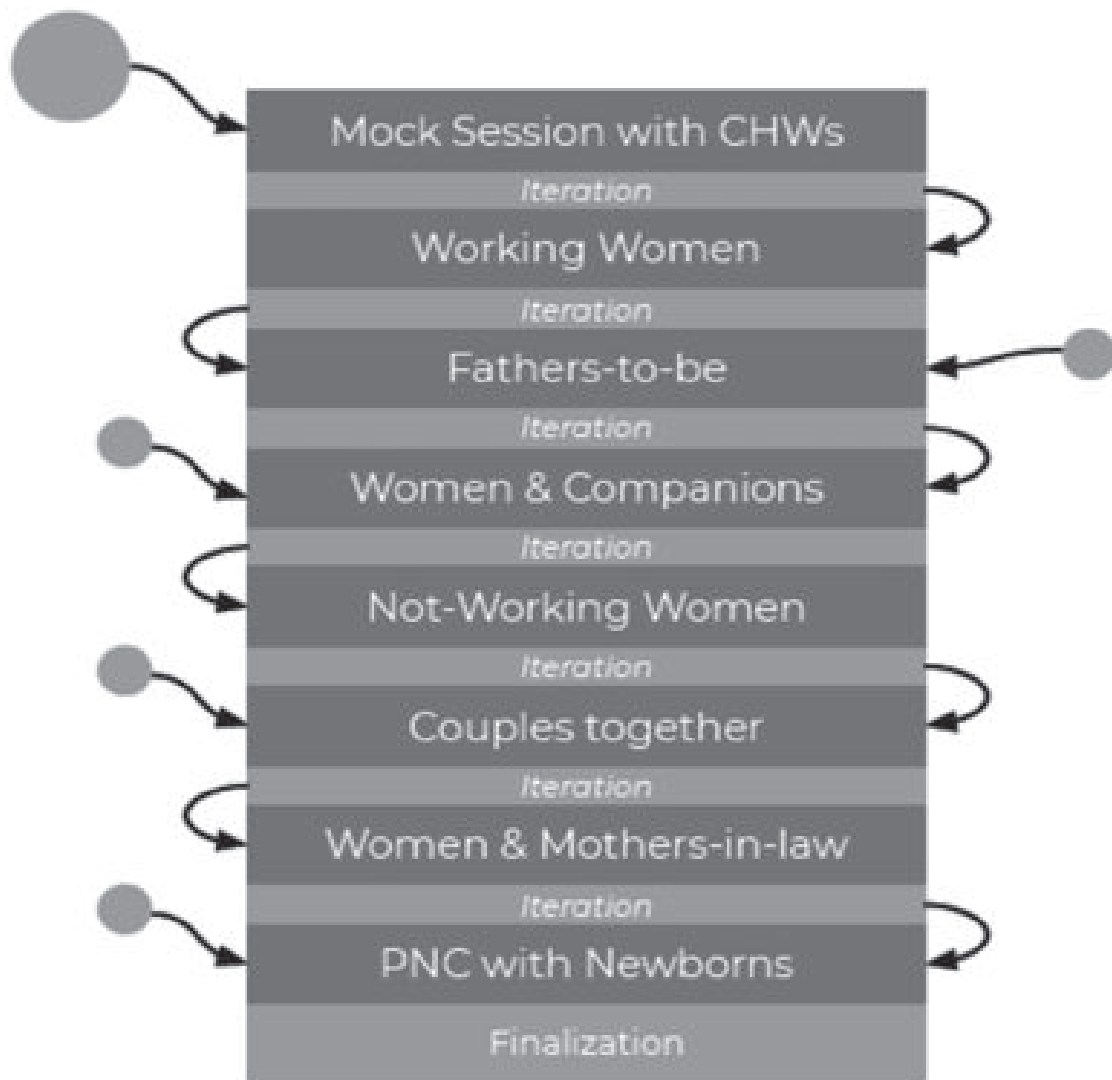
Based on the information gathered from the participants during phase 1, HWHF developed the GANC-GPNC model prototype to respond to the needs and opportunities identified.

**Phase 2: Prototyping**

In the second phase, the Healthy Women, Healthy Families (HWHF) project conducted 16 in-depth interviews, 08 Mock GANC-GPNC sessions using temporary materials and two focus group discussions to gather feedback on the GANC-GPNC model prototype. Participants included first-time mothers-to-be (pregnant women), both working and non-working; recent first-time mothers (lactating women) 2-4 weeks

postpartum; first-time fathers-to-be; group sessions with expectant couples (mixed gender); mothers/ mothers-in-law; companions who provided support to the pregnant women in daily life; and health providers (midwives/Shasthya Kormis).

During mock sessions, tailored guides, materials, and tools targeting the specific audience of that session were provided for the facilitators. After each of the sessions, iteration was done before proceeding to the next mock session. These mock sessions were facilitated by midwives and documented with photographs, short videos, and observation notes. Additionally, a facility observation session was done to evaluate marketing materials and visuals (Figure 1)



**Fig.-1:** GANC-GPNC prototyping process

The process of refining the prototype was iterative; after eight mock sessions with the different participants (as shown in Figure 1) and the 16 in-depth interviews and two focus group discussions, the group ANC-PNC model was considered ready for implementation through further piloting.

**Results:**

After synthesizing and analyzing all the information gathered through in-depth interviews and focus group discussions, as well as the feedback from the mock sessions, HWHF proposed a group model of ANC and PNC including five GANC sessions for first-time mothers-to-be (taking into consideration that both the World Health Organization and Bangladesh national standard is four or more). In addition, the group model included two GANC sessions for first-time fathers-to-be, two GPNC sessions for first-time mothers, and one GPNC session for first-time fathers (Figure 2).

The process of implementing the group model includes identification, registration, group formation, facilitation, and evaluation (Figure 3), which are further described below.

Identification: Shasthya Sebikas (CHVs) regularly work within the community to identify eligible couples and FP commodity demand. For the GANC model, they will identify first-time pregnant women and convey the household information to the Shasthya Kormis for registration.

Registration: Using the information they received from the Shasthya Sebika, Shasthya Kormis will visit the households where first-time pregnant women live, register them for GANC, and collect information on gestation and health care history.

Group formation: Midwives will then form a group of first-time mothers and will consider factors such as gestational age and the proximity of residences. These groups will be invited to participate in the group model by Shasthya Kormis and Shasthya Sebikas. Shasthya Kormis are trained frontline staffs who usually keep in closed contact in the community. Shasthya Sebika's are community-based volunteers, usually meets each intended member and households once in a month. Ideally, each group will consist of six pregnant women of close gestational age.

Facilitation: After forming the groups, a date for the first session will be determined by the group members. All sessions will take place in the health facilities, and trained midwives will facilitate the sessions. All sessions will follow the general flow illustrated in Figure 4.

Evaluation: After each group session with the pregnant women, midwives and doctors will conduct the individual physical examinations to maintain privacy.

Throughout the research and prototyping, it was observed that pregnant women's companions (i.e., sisters, sisters-in-law, mothers, mothers-in-law,

	GANC					Delivery	GPNC			
	GANC 1	GANC 2	GANC 3	GANC4	GANC5		1:1 with Midwife within 24 hr of Delivery	1:1 with Midwife within 7 days of delivery	GPNC1 10-20 Days	GPNC 2 32-42 Days
Timeline	Within 16 W	Between 20W-24W	Between 24W-28W	Between 30W-32W	Between 36W-38W					
Pregnant Women	✓	✓	✓	✓	✓		✓	✓	✓	✓
Expectant Fathers		✓		✓				✓		

**Fig.-2:** GANC-GPNC model schedule for pregnant women and expectant fathers.



**Fig.-3:** GANC-GPNC implementation process





**Fig.-4:** GANC-GPNC session flow chart

neighbors) can have considerable influence during pregnancy and post-birth. However, trying to incorporate these companions, especially mother and mother-in-law in the group sessions with pregnant women adversely affected the experience and quality of the sessions for the pregnant women. Therefore, through the HCD process, HWHF recognized that these companions should be involved in a different, targeted manner.

While the pregnant women are in their group session, there is an opportunity to meet the companions in the health facility waiting room/area. Separate, informal 30-minute sessions with the companions will be run by Shasthya Kormis and participation will be depended on who is accompanying the pregnant women during the sessions. The Shasthya Kormis will be provided with visual tools and messages. The messages will be tailored to focus on a set of clear actions the companions can take to support the mothers-to-be throughout their pregnancy journey.

#### **Discussion:**

After synthesizing and analyzing the information gathered in the interviews and discussions, the study identified key learnings about the pregnancy journey of first-time young mothers in the Tongi area.<sup>10</sup>

1. First-time parenthood is a complex emotional journey.

First-time parenthood signals a completely new life stage and thus is marked by strong emotions and governed by social norms around expected behavior and emotions. The news of pregnancy among married first-time expecting couples is in general warmly welcomed. Both men and women as well as their family members expressed great joy upon learning about the “good news” (pregnancy). Nevertheless, the approaching transition to parenthood was also marked by increased emotional strain for both men and women alike. Anxiety about the delivery, worries related to the wellbeing of the baby, changes in employment, and pressure to take care of the family were just some of the concerns expressed by expectant first-time parents. The study found that, in some ways, the approaching transition to parenthood seemed even more pronounced for men, who felt a radical shift from a care-free lifestyle to one marked by increased responsibilities. There were indications that men do not always receive the required support to navigate through this transition smoothly. The formative study revealed that the information and

emotional support go hand in hand in preparing first-time expecting couples for this transition to ensure physical and mental wellbeing. There is a tremendous opportunity to leverage the positive attitudes around approaching parenthood expressed by both women and men alike to pursue improved health outcomes for the whole family.

2. First-time pregnant women seek sister-like connections with providers.

First-time pregnant women value greatly and seek personal connections with their health care providers. Study participants mentioned that they seek sister-like guidance when navigating through the many physical, psychological, and social changes that approaching motherhood entails. They seemed to value two-way interactions: women appreciated the opportunity to ask questions and that the provider listened in addition to providing advice. The trusting relationship was often reciprocated by providers, at least in community-based health care. Such trusting relationships convinced expectant women about the good quality of services, thus encouraging them to continue to access care. The findings speak to the need for ensuring continuity of care in the provider-patient relationship. Building these personal connections between providers and young women over the long term may also turn out to be a good strategy for increasing the desirability of the services. In addition, meaningful connections with clients can also contribute to the well-being of health providers, increasing staff retention.

3. Service providers' scare tactics can create stress and unnecessary fears.

Good provider-patient interaction is of increased importance when catering to first-time parents as any shortcomings may adversely influence the uptake of services post-birth as well as in subsequent pregnancies. Despite the positive attitude and behavior of most of the service providers, the study found that there are indications that some community health workers utilize scare tactics and provide inaccurate information during counseling. To ensure that first-time parents get the best possible service experience, there is a need to support the

development of interpersonal and counseling skills of providers, paying particular attention to the two-way nature of communication. Instead of relying on scare tactics, utilizing positive pregnancy stories that link positive health behavior and good pregnancy outcomes is likely to yield better results in getting first-time parents-to-be to follow the current ANC guidelines.

4. Building Connections: Young expectant women have limited social connections in the city.

Social interaction with friends and people outside the family appears to be limited for many of the first-time pregnant women living in urban slum settings. The study found that this disintegration of young women's extra-familial social networks is caused by leaving paid employment prematurely, either due to pregnancy-related symptoms, pressure to end their friendships after marriage to focus more on their new family, or COVID-19-related layoffs. In addition, increased household responsibilities tie them to the private sphere, limiting the opportunities to interact with friends. Becoming a mother for the first time often triggers radical physical, psychological, and social changes that go hand in hand with increased worries and concerns. Consequently, first-time pregnant women have a heightened need for social support. Considering the typical living arrangements in Gazipur, the need for extra-familial support networks becomes more pronounced as most young married women live without their extended family, with husbands working long days outside the home.

5. Bringing Men into the Journey: Husbands want to feel included in the MCH journey.

The study found that some husbands feel excluded from health consultations as their role is limited to accompanying their pregnant wives to the facility. Typically, they are expected to wait outside the consultation room for the appointment to be finished. This prevents them from understanding what their pregnant wife is going through and preparing for their upcoming responsibilities to help care for the newborn. Moreover, when husbands are counseled, the information tends to focus on a rather limited set of topics—mainly covering maternal nutrition, the importance of abstinence during pregnancy, and arranging technicalities for

the approaching delivery such as money and transportation. The husbands who participated in this formative HCD research expressed interest to be more involved. They tended to greatly value counseling and expressed the desire to learn about pregnancy-related matters. In addition, some husbands expressed interest to pass on the information to educate others on matters related to pregnancy.

6. Parenthood is a joint venture with husbands taking a more active role.

Traditionally pregnancy is perceived as a woman's domain, which the husband is expected to support financially, but otherwise remain excluded from. A potential trend emerged that approaching parenthood is increasingly discussed by young couples and viewed as a joint venture with more equal sharing of preparation and parenting responsibilities. Some husbands take an active role in supporting their wives throughout pregnancy and post-delivery by helping out with household chores, preparing for the birth, and caring for their newborn. The study found the same joint mentality visible in relation to care-seeking, with husbands using their status to counterbalance the more traditional views of mothers-in-law to allow their wives to go for check-ups and other appointments. The study findings also provide an opportunity to leverage the emerging trend of co-parenting to expand the role that is currently ascribed to husbands. There is a need to strengthen couple communication and joint decision-making as early as possible.

7. Family members matter: A mother-in-law is considered the family expert and it limits women's agency.

Many different people influence the behavior of first-time expectant women. The relationship with the mother-in-law is a priority one in need of extra attention. Due to their lower social standing and lack of previous pregnancy experience, the study found that the young first-time pregnant women tend to have limited agency to follow the behaviors promoted for modern ANC if it conflicts with the beliefs held by their mother-in-law. Having gone through a pregnancy and childbirth experience, the mother-in-law is considered an expert and her position gives her the authority to dictate what her pregnant daughter-in-law should and should

not do. The study found the need to improve mothers-in-law's understanding of advances in knowledge about pregnancy and the benefits of modern ANC. Given their role in influencing the pregnancy, it is necessary to acknowledge and incorporate mothers-in-law into the new service model.

8. Discussing sexual interactions is an uncomfortable issue.

The design research found that sexual interaction during pregnancy is challenging to many women and difficult to negotiate with their husbands. First-time pregnant women emphasized during the study how this can be better addressed through counseling. Women believe this has far-reaching consequences for their well-being. The study also revealed that there is a mismatch between the needs of first-time pregnant women and the way in which ANC counseling approaches intercourse. Providers tend to focus exclusively on discussing the appropriate timing of intercourse regarding conception, bypassing the importance of consensual sex and other forms of intimacy altogether. Furthermore, both community and facility-based healthcare providers often struggle to communicate sensitive topics, in particular intercourse. There is a need to shift from abstinence-focused messaging to discussing the meaning of consensual sex and other forms of intimacy besides intercourse, and there is an opportunity to increase male involvement in such discussions.

9. Changes in service delivery can create misunderstandings.

The availability and cost of services is important to service seekers. The lack of clarity around service offerings, particularly around pricing, can lead to misconceptions and suspicions, preventing the uptake of services. To increase the uptake of services, intensified community sensitization efforts can help to communicate availability, changes, and accessibility in a clear and timely manner. Study participants suggested disseminating these messages through community awareness sessions. The study also found that there is also an opportunity to rethink the channels through which the messages are delivered to households to optimize the information flow.



10. The money problem is the main problem.

Low-income families often have to deprioritize medical services. Thus, cost considerations have gained prominence as a defining factor for access to healthcare. Regular health check-ups during pregnancy are not the highest priority for everyone, and many low-income people lack money to access services even if they perceive them to be important. COVID-19 has had drastic effects on livelihoods around the globe and low-income, urban first-time parents have been greatly affected. Additionally, the cost of basic necessities, goods, and services has increased, further tightening budgets. Due to a lack of information on financial support for services, many first-time expecting parents resorted to taking private loans to pay for the delivery and struggled with repayment, which further exacerbates financial stresses. Given the financial hardship to access care, the study found it is vital that service providers maintain an understanding approach toward clients and make sure that available financial support from any project, intervention, or charity is communicated clearly and reaches the neediest.

11. COVID-19: Compassion and connection is needed.

The COVID-19 pandemic has profoundly affected the ANC service experience for both health care providers and first-time pregnant women. Families were reluctant to let health workers enter their homes for fear of contracting the virus, which meant that at times community health workers had to counsel pregnant women from outside with limited privacy, over the phone, or forgo the service provision altogether. Several health providers spoke about having to work in an atmosphere of increased fear due to limited infection prevention and control protocols and lack of personal protective equipment. To address the fear and increase both providers' and care seekers' confidence in services, the study found that there is a need for standardized infection prevention and control protocols. In addition, increased emphasis should be placed on supporting the psychological well-being of both first-time parents and health providers to optimize the service experience.

Therefore, to improve the retention and quality of antenatal care (ANC) and postnatal care (PNC) and

dissemination of information on MNCH and family planning for young first-time pregnant women in Tongi, Management Sciences for Health (MSH), in collaboration with other partners, utilized a Human-Centered Design (HCD) approach to design a group ANC (GANC)- group PNC (GPNC) model in consultation with service users, service providers, and caregivers. The group model, co-designed with young women and health workers, complements existing facility-based care with a community platform and social support services.

**Conclusion:**

The GANC-GPNC model is unique in the consideration that it is based on collaborative, interactive, and participatory. Rather than solely providing didactic hierarchical information, the model promotes sharing of experiences and knowledge guided by healthcare providers in a facilitative manner. Ultimately, the model will improve access to high-quality antenatal, postpartum, FP, neonatal, and child health services for first-time parents, especially young expectant women and first-time mothers in urban, low-income settings. With further adaptation, the model can be scaled and replicated across Bangladesh.

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