



Digitally strengthened, midwife-led intervention to reach the unreached mothers across ten conflict-prone provinces of Afghanistan during humanitarian crisis

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Abstract

Background: Coronavirus disease 2019 (COVID-19) pandemic had significant negative impact on sexual and reproductive health (SRH) with devastating impact on pregnant women in resource constrain humanitarian settings. This paper provides detailed account of a community midwife-led intervention in ten humanitarian settings of Afghanistan using world health organization (WHO) emergency disaster risk management (EDRM) framework.

Objectives: The project is aimed at increasing access to Integrated Package of Essential SRH Services and Minimal Initial Service Package (MISP) with a specific focus on prevention of Postpartum Haemorrhage (PPH) and screening and management of preeclampsia and eclampsia.

Methods: The project was implemented through 150 Community outreach midwives (COMs). Each midwife served 300 households; mentored by gynaecologists and supervisors. Midwives were trained through a digitally enabled, simulation based training and equipped with a set of off-the shelf devices and kits.

Results: During COVID-19 pandemic and in absence of health care services during crisis, this intervention has played as a lifesaving intervention for the community in Afghanistan. Variable digital literacy, sociocultural barriers, reluctance in adapting to digital platforms, security and uncertainties were some of the challenges faced. Adaptation of outreach methods integrated high impactful digital technologies has been the most appropriate strategy "to reach the unreached".

Conclusion: Through this model, national and global stakeholders were engaged even during the crisis in Afghanistan. It also provided vital inputs for the donors, governments, civil society organizations and other stakeholders for sustaining and advancing the delivery of quality SRH services in humanitarian settings.

Keywords: Midwifery, Eclampsia, Sexual Health, Postpartum Haemorrhage, Humanitarian.

Introduction

The Coronavirus disease 2019 (COVID-19) pandemic had disrupted life and healthcare systems across the globe. Sexual and reproductive health rights (SRHR) are not an exception to this.^[1-3] There have been reports of increased unintended pregnancies, a higher incidence of sexual and

gender-based violence (SGBV)^[4,5] and maternal deaths. Apart from significant changes in the SRHR needs, the pandemic had resulted in severe disruption of access to essential SRHR services,^[1] including contraception, safe abortion,^[6] gynaecological services, HIV, and maternal health services.^[7] The negative impact has been

disproportionately high on poor and vulnerable populations,^[8] especially those living in fragile and humanitarian settings.^[9] Further deepening of disparities in women's sexual and reproductive health during the coronavirus disease 2019 (COVID-19) pandemic was also highlighted by the Lancet report.^[10]

The direct and indirect effects of COVID-19 on pregnant women are of particular concern. Direct impacts of COVID-19 infection include a higher risk of preeclampsia, preterm birth, poor maternal and fetal outcomes.^[11] Indirect effects include limited access to quality antenatal, intra-natal, and post-natal care, leading to a huge increase in maternal and neonatal morbidity and mortality.^[12,13]

Afghanistan is a country with a fragile health care system and poor status of SRHR indicators. Indicators related to fertility quality of maternal and child health services are among the lowest globally. However, large subnational disparities exist across different provinces in some of these indicators. The average age at marriage varies from 16.2 years in Nimroz province to 19.9 years in Wardak province, with a national average of 18.8 years. The total fertility rate (TFR) varies from 2.8% in Ghazni province to 8.9% in Nooristan province, with a national average of 5.1%. Modern Contraceptive Prevalence Rate (MCP) varies from 0.5% in Nooristan province to 58.2% in Herat and Kabul provinces, with a national average of 17.4%.^[14,15]

The exact burden of maternal mortality is highly debatable.^[16] The maternal mortality ratio of 638 per 1000000 live births (ranging from 427 to 1010), as reported by the Interagency Working Group (IAWG), is a major concern.^[17] They are predominantly contributed by postpartum hemorrhage (59.9%) and preeclampsia/eclampsia (19.8%).^[18] The proportion of deliveries attended by a skilled birth attendant (SBA) varies from 1.1% in Nooristan province to 84.5% in Kabul province, with a national average of 58.8%. The proportion of institutional deliveries varies from 0.8% in Nooristan province to 82.4% in Kabul province, with a national average of 48%.^[14,15]

Complex socio-cultural barriers, poor education, a fragile system created by protracted war and conflict, natural disasters, and dependency of the health system on international funding are major contributing factors to the poor SRHR situation. A weak and fragmented health system with poor support infrastructure and ecosystems is also a major limitation.^[19-22] The COVID-19 pandemic had left a further devastating impact on the sexual and reproductive health of Afghan people, especially

adolescents, women, and poor and vulnerable populations.

The unanticipated and devastating negative impact of the COVID-19 pandemic had created a necessity and provided an opportunity to adopt innovative service delivery models (SDMs) for the delivery of SRHR.^[23,24] Many nations have recognized SRHR services as essential health services, facilitating service providers to continue service provision through alternate modalities. There were a few instances of interim policy changes to allow home-based services and self-care.^[25] But critical appraisal of SDMs and existing evidence on the successful interventions is still scarce. A review of available scientific and grey literature suggests that the new service delivery models that came into existence or scaled up following the COVID-19 pandemic can be broadly segregated into outreach-based services, digital health interventions (DHI), or hybrid models with both these components.

One of the major impacts of the COVID-19 pandemic was a sudden surge of DHI, leveraging the new technological advancements.^[26] A wide range of SRH services, including contraceptive counselling,^[27] Sexually Transmitted Infection/Reproductive Tract Infection (STI/RTI) services, menstrual disorders, antenatal care, post-natal care, etc., were successfully delivered through digital health interventions. However, some of the services, including intrapartum services, long-term and permanent methods (LAPM) of contraception, and safe abortion services, were not amenable for effective delivery through DHI. Some of the digital health interventions have also demonstrated good success in terms of utilization and positive feedback by users in fragile situations.^[26] Nevertheless, another major concern with DHI was the deepening of already existing disparities in access to SRHR services to poor and vulnerable populations with limited access to Information Communication Technologies (ICT).

The other important service delivery model adopted for SRHR delivery was community outreach-based interventions delivered through midwives, volunteers, reproductive health promoters (RHPs), etc. Some researchers have strongly advocated for community-based midwifery-led interventions for maternal and child health.^[28] Deployment of community health workers was reported to be one of the effective ways to women belonging to marginalized households".^[29]

"COVID-19 is here to stay, better we learn to live with it" is the harsh reality dawning on every one of us. Hence it is imperative to learn our lessons quickly, as the world is not in a position to afford the wastage of any resources. The

prevailing uncertainty on what works and what does not work can further amplify the damage done by COVID-19 by redirecting already strained resources toward ineffective interventions. Hence, there is a need for strong evidence of successful interventions. Detailed documentation of the nature of these interventions using a standard approach, planning, implementation, challenges encountered, final outcomes, and impact of interventions is the best way forward.

Researchers and social scientists have emphasized the strong need for investing in building the resilience of societies to handle SRHR issues in general, particularly maternal and neonatal health.^[30] World Health Organization (WHO) had proposed Emergency Disaster Risk Management (EDRM) framework for countries to plan and design interventions that can enhance the resilience to respond to major health emergencies during emergency/disaster situations.

The current proof of concept paper is envisaged to provide a detailed account of a midwifery-led technology-enabled intervention aimed at delivering comprehensive SRHR services, with special emphasis on maternal health across ten conflict-prone provinces of Afghanistan, broadly designed as per the EDRM framework.

Objectives

- To increase access to comprehensive Integrated Package of Essential SRHR Services (IPES) and Minimal Initial Service Package (MISP) with a specific focus on the prevention of Postpartum Haemorrhage (PPH) and screening and management of preeclampsia and eclampsia.
- To establish a virtual consultation center staffed by obstetricians for referral support, supervision, and monitoring of community-led intervention.
- To create an enabling environment to reduce cultural barriers with increased awareness and acceptance of SRH among influential actors of society.
- Systems strengthening with building a cadre of trainers, socially culturally appropriate digital tools/platforms, and service delivery infrastructure.

Program Design and Implementation

Project implementation area: The proposed project has been implemented across ten conflict-prone provinces of Afghanistan, providing SRHR services to 45000 households. The provinces have been selected based on the presence of the service delivery organization, status of SRHR indicators, security situation, and overall logistic feasibility [Table 1].

Status of key SRHR Indicators in selected provinces:

The average age at marriage was below 20 years. A total fertility rate of 5.1 (4.6-7.7), and a modern Contraceptive Prevalence Rate (MCP) of 17.4 (4.3-26.5) indicate a strong need for strengthening contraceptive services. The percentage of institutional standing at 48% at the national level (22.4-82.4%) and the percentage of deliveries attended by SBA standing at 58.8% (25.4-84.5%) indicate a strong need for strengthening maternal health and SRH services in some of the provinces.^[14,15]

Project timeline: The project has been implemented over a 12-month period from March 2021 to February 2022.

Proposed service delivery model: The proposed services delivery model is an amalgamation of a community outreach midwife-led service delivery model, with the strategic integration of DHI in capacity building, decision support, and provision of effective referral services. The services have been delivered by 150 Community Outreach Midwives (COMs), with each midwife catering to 300 households. The midwives have been supervised by a group of 20 midwife supervisors (MWS) with a ratio of 7-8:1 and five obstetricians with a ratio of 30:1 [Figure 1].

The recently proposed WHO EDRM framework was taken as a broad guiding framework for the program design. Health EDRM is a "continuum of measures in which the emphasis is placed on managing the risks of the potential emergency or disaster, and not solely responding to the event or crisis, and on building the resilience of communities and countries." [Table 2].^[31]

Stakeholder Profile: The proposed project involves multiple stakeholders with a diverse skill sets, expertise, and service portfolio. This has created a finely balanced consortium of organizations providing policy, administrative and technical support to the project [Figure 2].

Ethical considerations

The study was approved by the institutional Ethics Committee at Department of General Medicine, Ministry of Public Health, Islamic Republic of Afghanistan under approval No. 505756.

Financing and leadership

Policy support

- a. The government of Japan (GoJ), through its Japan Supplementary Fund, is the donor of the project. The undeterred commitment of the donor to the well-being of the population in resource-poor settings,

people, women, and children of Afghanistan is the primary driving force behind the project.

- b. International Planned Parenthood Federation (IPPF): The leadership and commitment of IPPF to providing comprehensive SRHR services to the most marginalized population, especially in humanitarian and conflicting settings, is another key driving force.

- c. **National and provincial level:** The vision and continuous support of the Ministry of Public Health (MoPH, Afghanistan) and Provincial Health Directorates (PHDs) of the 10 provinces are vital for the successful implementation of the program. Establishing a formal integrated referral support system with the existing health care system of Afghanistan is one of the key aspects.

Table 1. Summary of key SRHR indicators of selected provinces (Project implementation area)

| Province | The average age at marriage | Total fertility rate (TFR) | Modern CPR | % Deliveries attended by SBA | % Institutional deliveries |
|-----------------------|-----------------------------|----------------------------|------------|------------------------------|----------------------------|
| Afghanistan (Country) | 18.8 | 5.10 | 17.40 | 58.8 | 48.0 |
| Kabul | 19.6 | 4.6 | 26.5 | 84.5 | 82.4 |
| Nangarhar | 18.6 | 6.4 | 13.3 | 66.3 | 64.6 |
| Herat | 18 | 4.8 | 58.2 | 40.2 | 39.3 |
| Balkh | 19.2 | 5.5 | 13.1 | 50.6 | 48 |
| Parwan | 19.7 | 5.7 | 23.8 | 52.5 | 48.7 |
| Kapisa | 18.8 | 4.8 | 19.1 | 49.8 | 48.7 |
| Laghman | 19.1 | 7.3 | 13.6 | 62.2 | 58.4 |
| Bamyan | 18.1 | 5.4 | 21.5 | 46.9 | 46.2 |
| Badakhshan | 17.7 | 5.3 | 7.2 | 25.4 | 22.4 |
| Samangan | 18.7 | 5.1 | 4.3 | 32.8 | 31.4 |

Source: Afghanistan 2015 Demographic Health survey & Afghanistan Health Survey 2019. Sexual and reproductive health rights: SRHR; Modern Contraceptive Prevalence Rate: MCPR; Skilled birth attendant: SBA.

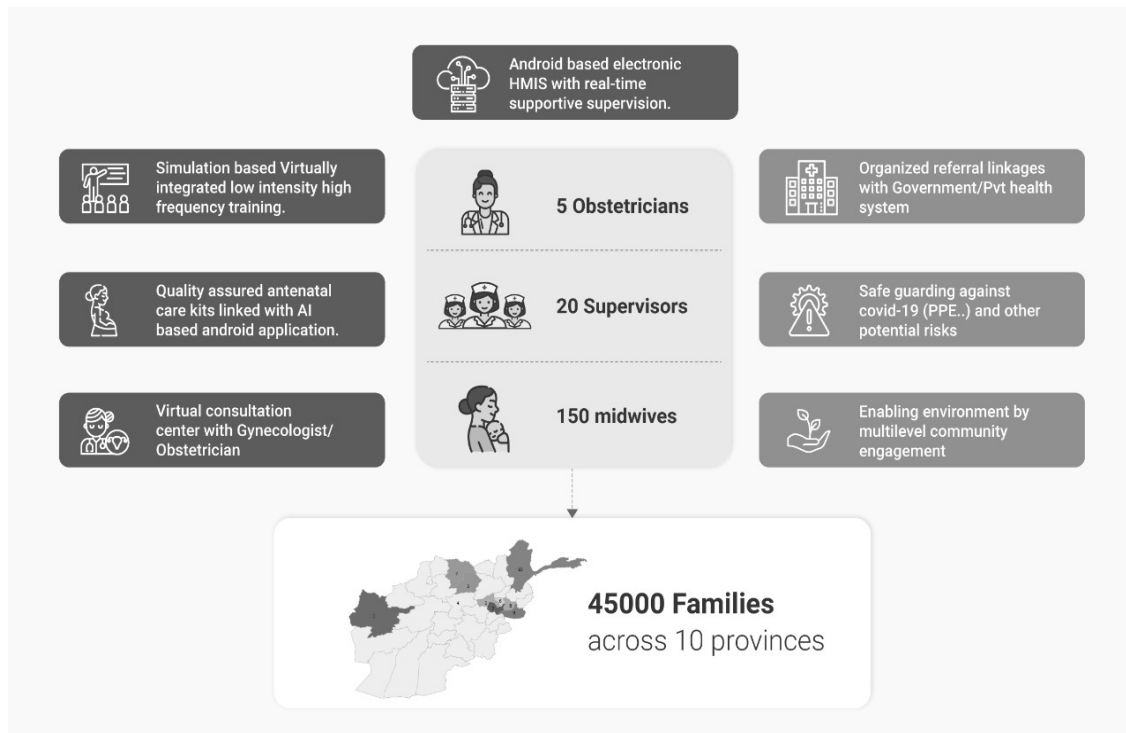


Figure 1. Schematic diagram of the proposed midwife-led digitally strengthened model of care/service delivery model.

Table 2. Key project components as per WHO emergency disaster risk management (EDRM) Framework

| EDRM component | Project status |
|--|--|
| Policies, strategies, and legislation | The presence of a national midwifery policy clearly defines the roles of midwives. Identification of Midwife-led interventions as an important strategy to deliver Basic EMOC services Availability of legal framework for midwifery practice in the country. |
| Planning and co-ordination (at all levels national, subnational, and local) | Involvement of national and provincial health directorates in the planning and implementation of the program Signing official MoU with national and provincial health directorates for coordinated service delivery, including capacity building, commodities, organized referral system, data sharing, etc |
| Human Resources | Availability of qualified and trained multi-disciplinary human resources. Training needs assessment to identify critical gaps in essential skills. Capacity building of MISP essential SRHR services in a humanitarian setting |
| Financial Resources | Low dose, high-frequency simulation-based training/mentoring delivered through a digital platform Budget allocation for Humanitarian capacity building Budget allocation for the safeguarding of the service providers (Including supply of PPE) |
| Information and knowledge management | Development of modules, videos, e-learning content, P2P evaluation tools, and other training resources in local language (Dari and pasto) Inbuilt impact evaluation of all the capacity building and mentoring sessions Highly relevant operational research to generate scientific evidence. Dedicated communication/technical team to document and disseminate the evidence with a clear communication strategy and work plan |
| Risk communication | Organized risk communication strategy as per national COVID-19 prevention and screening guidelines. |
| Health infrastructure and logistics | Establishment of a virtual consultation center staffed by qualified obstetricians to provide teleconsultation services for high-risk pregnancies and other SRHR services needing specialist care |
| Health-related services | The package of health services prioritized based on the status of key health indicators at the national and provincial level |
| Community health EDRM approaches | Strong community engagement with influential local community and religious leaders Sensitization of key community members on |
| Monitoring and evaluation | Android-based eHMIS for real-time recording and reporting of the data Multilevel data analytics dashboards with key SRHR and programmatic indicators for effective monitoring, evaluation, feedback |

EDRM: Emergency disaster risk management, MISP: Minimum initial service package, eHMIS: Electronic health information management system, EMOC: Emergency obstetric care, MoU: Memorandum of understanding, SRHR: Sexual and reproductive health rights, PPE: Personal protective equipment, P2P: Peer-to-peer

Technical support: Multiple technical collaborating partners played a vital role in the current program implementation.

- a. Laerdal Global Health (LGH) and Fernandez Health and Educational Research Foundation (FHERF) together brought their decades of experience in midwifery training and service provision. The training strategy adopted in low dose high-frequency training is simulation-based and delivered through a digital platform.
- b. CareNX team, with the experience of successfully implementing the "AnandiMa" ANC kit and "CareMother" smartphone application, which is a

"decision Support Tool" for midwives, have enhanced the quality of ANC to global standards.

- c. Android-based client-level HMIS system built on the globally popular DHIS2 platform by HISP India is vital in effective data capturing, analysis, and reporting. This also has envisaged optimizing the service provider's time by significantly reducing the time spent on recording and reporting the data.

"Sewa Rural," with decades of working at the grassroots level and implementing many community-level interventions, has provided support in the implementation of the micro plan participatory evaluation of the project

Table 3. Program component-wise Risk Management Plan

| EDRM component | Anticipated challenges | Mitigation measures |
|--|---|---|
| Policies, strategies, and legislation | Gaps in National midwifery policy and lack of evidence base for some key strategies | Strong engagement with MoPH, AMA, and other stakeholders in the form of steering committee |
| Planning and co-ordination (at all levels national, subnational, and local) | Travel restrictions, Strong engagement of key MoPH officials in COVID-19 activities | Alternate plans to engage with key stakeholders digitally. Alignment of project outputs with National priorities Supporting the government with COVID-19 prevention and screening activities |
| Human Resources | Shortage of qualified and trained midwives Non-willingness to work in the community setting. Resistance to adaptation to new innovations/technologies | Intense collaboration with midwifery schools and other organizations and mapping of trained resources in the country. All safeguarding measures in place and incentivization Making all the platforms highly user friendly Strong induction and ongoing mentoring Dedicated IT support system Participatory approach in design and implementation Strong positive feedback loop with real time data utilization |
| Financial Resources | Language/technical barriers in imparting efficient skill development Short duration of the project and lack of continued support | A dedicated cadre of supervisors and project staff with good English communication skills Translation of all tools/materials in local language Documenting strong evidence and economic evaluation to garner extended support from the donor Mapping the other likely sources and alternate financing mechanisms |
| Information and knowledge management | Short time period of project Security concerns for communication/research teams to work from the field. | Meticulous planning well in advance Suitable adaptation of digital technologies Strong community engagement and collaboration with local agencies for field work |
| Risk communication | No specific challenges anticipated | |
| Health infrastructure and logistics | Delay in shipment of antenatal kits/Mannequins and other commodities Limited availability of referral services | Identification of this as a highly critical activity and making all efforts to minimize the time delays. Backup plan to borrow similar mannequins available with other organizations within the country Establishment of virtual referral consultation centre Optimization of referrals using AI based "Decision support system". |
| Health related services | Diversion of the limited health infra and facilities to COVID-19 services | Task shifting of all possible critical procedures/skills to the COMs. |
| Community health EDRM approaches | Community resistance to share information and co-operate COMs Volatile Security situation | Strong community engagement and sensitization of key community/religious leaders |
| Monitoring and evaluation | Resistance to adapt to HMIS. Internet connectivity issues Mother's perceived threat to confidentiality of the personal data | Participatory approach in design of HMIS Building automatic real time data analysis dashboards to create positive feedback loop Encrypted server with data access limited to selective project implementation team members. Digital safety and security as per global standards in data storage, transfer. Only De-identified data to be used for review and analysis |

AMA: AFGA midwifery association, AFGA: Afghan Family Guidance Association, EDRM: Emergency disaster risk management, MoPH: Ministry of public health, HMIS: Health information management system, IT: Information technology, AI: Artificial intelligence, COMs: Community outreach midwives

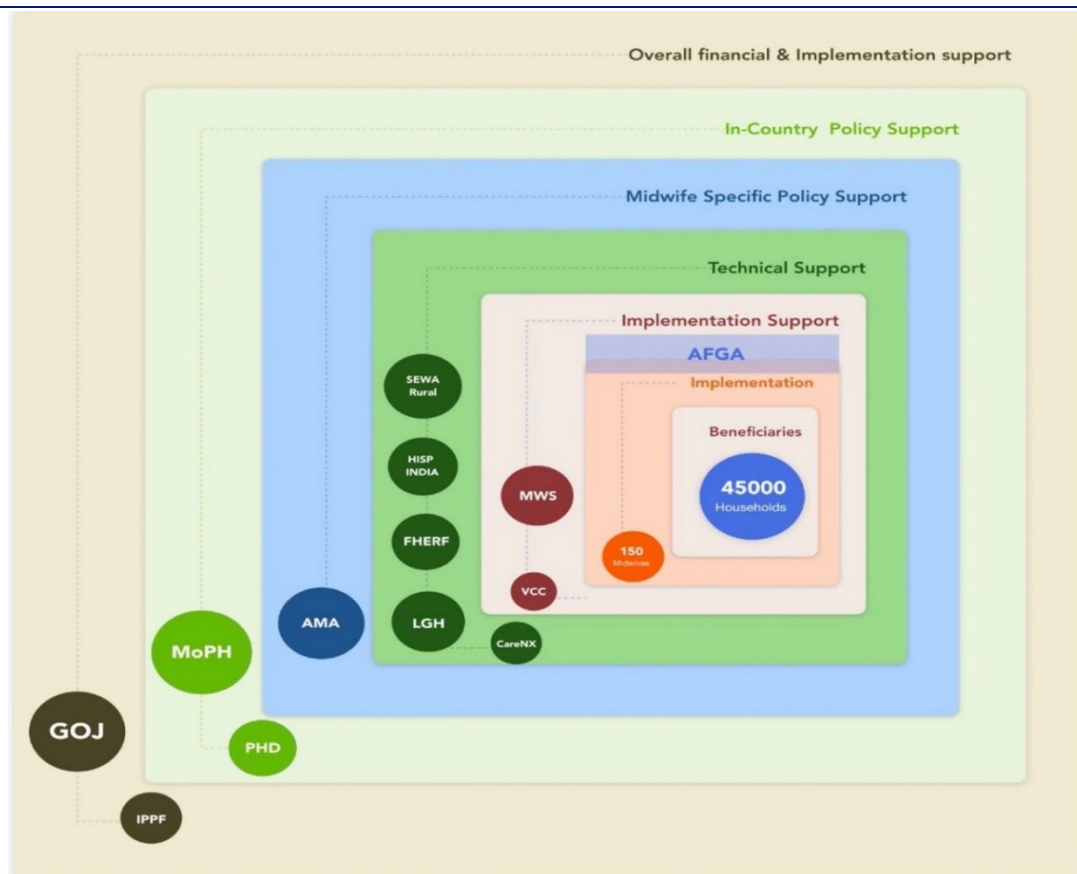


Figure 2. Stakeholder matrix of the proposed project implementation

GoJ: Government of Japan, IPPF: International Planned Parenthood federation, MoPH: Ministry of Public Health, PHD: Public Health Directorate, AMA: Afgan Midwifery Association, LGH: Laerdal Global Health, FHERF: Fernandez Health and Education Research Foundation, HISP India: Society for Health Information System Processing, VCC: Virtual Counselling Center, MWS: Midwifery supervisors, AFGA: Afghan Family Guidance Association

Table 4. Log framework of the project

| Indicators | Details |
|-------------------------------------|--|
| Input and process indicators | <ul style="list-style-type: none"> Recruitment and Training Of 150 midwives & 5 Gynaecologists Procurement of required Commodities Hotline/referral |
| Output | <ul style="list-style-type: none"> Android based HMIS Number of IPES & MISP services provided to the community. 45000 households enrolled. 7500 pregnant women for ANC/PNC 1500 High risk Pregnancies refereed. 80000 women screened for GBV 200 clerics sensitized |
| Outcome | <ul style="list-style-type: none"> Number of maternal deaths averted Number of unwanted pregnancies prevented Increase % of Institutional deliveries 80% pregnant women receiving 5 ANC/PNC |
| Impact | <ul style="list-style-type: none"> Improve percent of deliveries conducted by SBA Reduction in MMR by 50% within the project implementation area MCPR increase by 5% within the project implementation area Decrease in Unmet need for FP by 10% within the project implementation area |

HMIS: Health information management system, MISP: Minimum initial service package, IPES: Integrated package of essential SRHR services, SRHR: Sexual and reproductive health rights, ANC: Antenatal care, PNC: Postnatal care, GBV: Gender-based violence, SBA: Skilled birth attendant, MMR: Maternal mortality rate, MCPR: Modern contraceptive prevalence rate, FP: Family planning

Implementation support

- a. IPPF's member association in Afghanistan, Afghan Family Guidance Association (AFGA), is the primary implementing agency of the project with more than five decades of experience provisioning a comprehensive package of SRHR services in the country.
- b. The establishment of an in-house virtual consultation center supported by qualified obstetricians enabled by appropriate technologies has been one of the keys to the provision of effective referral services.

A layer of 20 midwifery supervisors acted as master trainers and mentors. This has been one of the important strategies to overcome the language and cultural barriers in imparting effective training through a digital platform and to provide ongoing monitoring and mentorship of the midwives in the field

Enabling environment: In addition to the larger role played by the government and professional bodies, strong engagement of community religious leaders and key influencing people has also been one of the vital strategies.

A detailed profile of the key stakeholder involved, relevant expertise, evidence for their interventions, and the specific role played in the current project is provided as a supplement.

Challenges and mitigation measures: Anticipated challenges and mitigation measures in various components of the WHO EDRM framework [Table 3].

The proposed impact of the project: A comprehensive baseline, house-to-house, survey of 45,000 households in specified provinces to assess the status of key SRHR and MCH indicators including Maternal Mortality Rate (MMR) and its causes.

Some of the key services delivered by the project are:

- 95,909 clients provided 2,48,448 SRH and non-SRH services in the project area by 150 trained midwives
- 96% (7333 / 7500) of pregnant women received home-based obstetric care and delivery services, of which 47% (3457) high-risk pregnant women were screened and provided regular services through follow-up home visits, and all 96% (7333/5700) pregnant women received regular ANC /PNC check-ups and services against 80% target
- Around 949 deliveries were conducted by midwives at home with support from online consultation by gynaecologists
- The training was completed for 150 midwives and four gynaecologists on home-based obstetrics and Non-SRH services. They were equipped with an ANC

kit, a clean delivery kit, and basic medicines for service delivery [Table 4].

Conclusions

The current project is one of the unique, highly structured programs catering to the comprehensive SRHR needs of people living across ten provinces of Afghanistan. During the COVID-19 pandemic and in absence of health care services during the crisis, this has played as a lifesaving intervention for the community in Afghanistan. Variable digital literacy, sociocultural barriers, reluctance in adapting to digital platforms, security, and uncertainties were some of the challenges faced.

Adaptation of outreach methods integrated high impactful digital technologies has been the most appropriate strategy "to reach the unreached". Through this model, national and global stakeholders were engaged even during the crisis in Afghanistan. It also provided vital inputs for donors, governments, civil society organizations, and other stakeholders for sustaining and advancing the delivery of quality SRH services in humanitarian settings.

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Competing interests

The authors declare that they have no competing interests.

Abbreviations

Coronavirus disease 2019: COVID-19;
 World Health Organization: WHO;
 Sexual and reproductive health: SRH;
 Emergency disaster risk management: EDRM;
 Sexual and reproductive health rights: SRHR;
 Sexual and gender-based violence: SGBV;
 Minimal Initial Service Package: MISP;
 Postpartum Haemorrhage: PPH;
 Community outreach midwives: COMs;
 Total fertility rate: TFR;
 Modern Contraceptive Prevalence Rate: MCPR;
 Interagency Working Group: IAWG;
 Skilled birth attendant: SBA;
 Service delivery models: SDMs;
 Digital health interventions: DHI;
 Long-term and permanent methods: LAPM;
 Information Communication Technologies: ICT;
 Reproductive health promoters: RHPs;
 Integrated Package of Essential SRHR Services: IPES;

Modern Contraceptive Prevalence Rate: MCPR;
 Midwife supervisors: MWS;
 Afghan Family Guidance Association: AFGA;
 Government of Japan: GoJ;
 International Planned Parenthood Federation: IPPF;
 Ministry of Public Health: MoPH;
 Provincial Health Directorates: PHDs;
 Laerdal Global Health: LGH;
 Fernandez Health and Educational Research Foundation:
 FHERF;
 Maternal Mortality Rate: MMR;
 AFGA midwifery association: AMA.

Authors' contributions

All authors read and approved the final manuscript. All authors take responsibility for the integrity of the data and the accuracy of the data analysis.

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Role of the funding source

None.

Availability of data and materials

The data used in this study are available from the corresponding author on request.

Ethics approval and consent to participate

The study was approved by the institutional Ethics Committee at Department of General Medicine, Ministry of Public Health, Islamic Republic of Afghanistan under approval No. 505756.

Consent for publication

By submitting this document, the authors declare their consent for the final accepted version of the manuscript to be considered for publication.

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