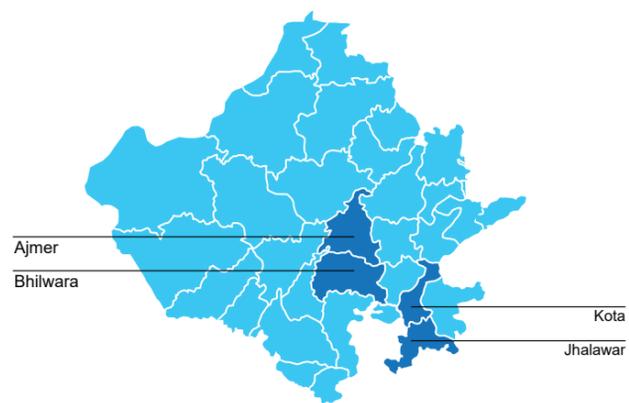
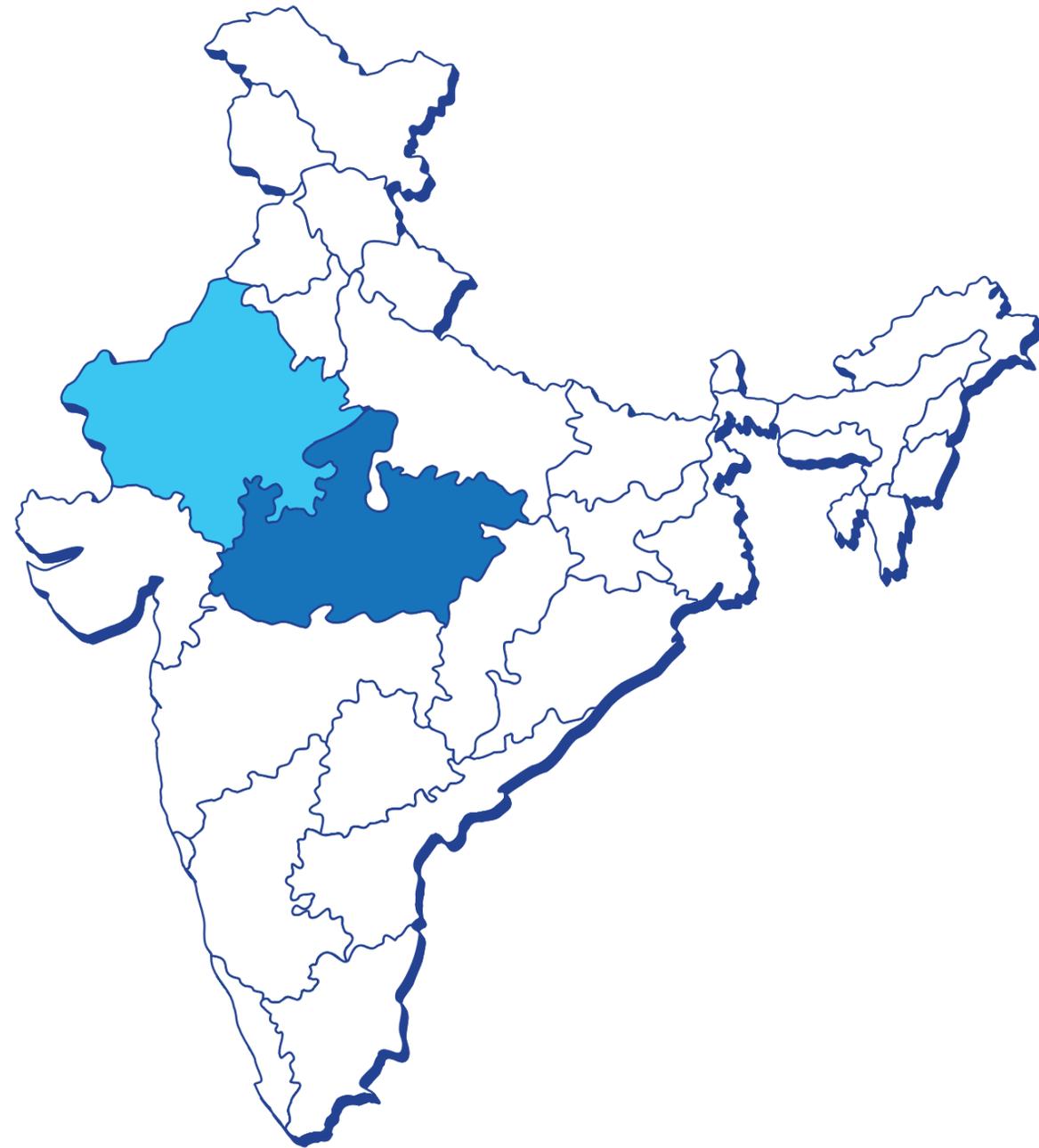


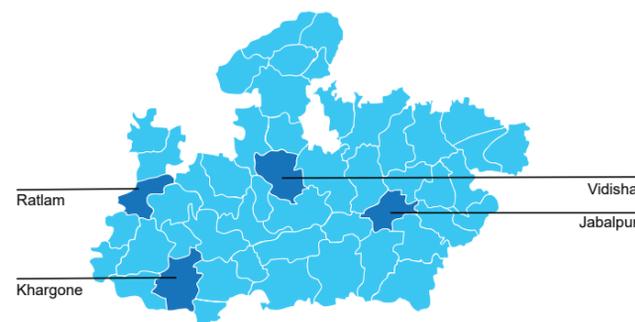


LEVERAGING TECHNOLOGY FOR IMPROVED QUALITY OF MATERNAL AND NEWBORN CARE





RAJASTHAN
39 Facilities



MADHYA PRADESH
42 Facilities

India has been making significant strides in lowering its maternal and newborn mortality rate over the past three decades. Yet, each maternal and newborn life that we continue to lose each day due to preventable causes is a stark reminder of the long journey ahead.

ASMAN came into existence to accelerate the reduction of maternal and newborn mortality by building upon existing efforts of the Government of India while leveraging the power of technology. By empowering providers in public health facilities through training and mentoring support, and innovative tech-based solutions, ASMAN has sought to improve the quality of maternal and newborn care for better health outcomes in 81 public health facilities across 8 districts of Madhya Pradesh and Rajasthan.

For healthcare professionals equipped with the right knowledge, skills, and robust technology to deliver quality services, the sky is really the limit.

ACKNOWLEDGEMENTS

This comprehensive report has been put together with the participation and valuable inputs of numerous respondents.

We acknowledge the crucial contributions of each of the Alliance partners - Bill and Melinda Gates Foundation, MSD for Mothers, Reliance Foundation, Tata Trusts, and United States Agency for International Development. We also thank the Program Management Unit and implementation agencies – Jhpiego, Avalon Information Systems, Bodhi Education, Edelman and Sambodhi for their inputs.

Finally, we extend our sincere thanks to the Governments of Madhya Pradesh and Rajasthan for enabling us to carry out the intervention, and supporting us throughout the journey. The implementation of ASMAN would not have been possible without their enthusiasm and active support for the program.

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LIST OF ABBREVIATIONS

AMTSL	Active Management of Third Stage of Labor	NMR	Neonatal Mortality Rate
ASMAN	Alliance for Saving Mothers and Newborns	Ob/Gyn	Obstetrician/Gynecologist
ANM	Auxiliary Nurse Midwife	OSCE	Objective Structured Clinical Examination
API	Application Programming Interface	PA	Periodic Assessment
BMGF	Bill and Melinda Gates Foundation	PCTS	Pregnancy, Child Tracking & Health Services Management System
CHC	Community Health Center	PE/E	Pre-eclampsia/Eclampsia
CMHO	Chief Medical Health Officer	PHC	Primary Health Centre
DH	District Hospital	PIP	Program Implementation Plan
DLSM	District Level Sensitization Meetings	PMU	Program Management Unit
DPM	District Program Manager	PO	Program Officer
FBSR	Facility Based Still Birth Rate	PPH	Postpartum hemorrhage
FOGSI	Federation of Obstetrics and Gynaecologists Societies of India	QoC	Quality of Care
Goi	Government of India	RA	Rapid Assessment
IT	Information Technology	RF	Reliance Foundation
IV	Intra Venous	RJ	Rajasthan
ICMR	Indian Council of Medical Research	RCH	Reproductive and Child Health
JSY	Janani Suraksha Yojana	RCHO	Reproductive Child Health Officer
LR	Labor Room	RNBC	Routine Newborn Care
LR I/c	Labor Room In-charge	RSC	Remote Support Center
MC	Medical College	SDA	Safe Delivery App
MCH	Maternal and Child Health	SDG	Sustainable Development Goals
MCTS	Mother and Child Tracking System	SDH	Sub Divisional Hospital
MD	Mission Director	SOP	Standard Operating Procedure
MER	Monitoring Evaluation and Research	SNCU	Special Newborn Care Unit
MMR	Maternal Mortality Ratio	ToT	Training of Trainers
MO I/c	Medical Officer In-Charge	UAT	User Acceptance Test
MSD	Merck Sharp and Dome	UI	User Interface
MoU	Memorandum of Understanding	USAID	United States Agency for International Development
MoHFW	Ministry of Health and Family Welfare	VC	Verification Criteria
MP	Madhya Pradesh	WHO	World Health Organization
MSV	Mentoring and Support Visits		
NHM	National Health Mission		



1. EXECUTIVE SUMMARY

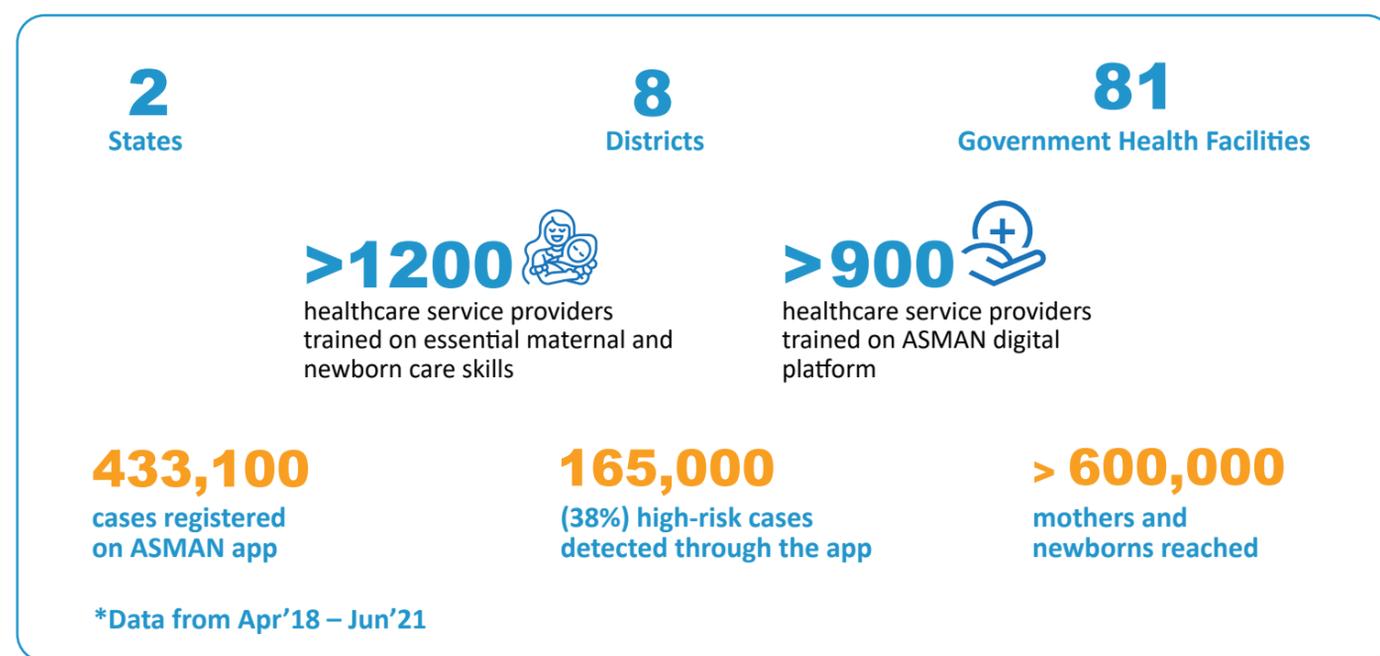
Enhancing quality of maternal and neonatal care through capacity-building and innovative technology

The foundation of the ASMAN intervention rests on the systemic need to strengthen provider knowledge and skills for improved maternal and newborn health outcomes. Through training and mentoring support, and technological empowerment, the initiative centred around improving provider performance and decision-making capabilities, to help reduce preventable deaths.

Maternal and newborn health form a vital part of the Sustainable Development Goals (SDGs), and are recognized for their increasingly instrumental role in the achievement of the overall SDGs globally. Galvanized efforts to reduce maternal and neonatal mortality have shown promising results in the recent past, with MMR declining globally by nearly 44% and by about 69% in India between 1990 and 2015¹. Neonatal mortality rates (NMR), though falling from 36 deaths per 1000 live births in 1990 to 19 in 2015, have been declining at a relatively slow pace².

An analysis of peer-reviewed journals focusing on developing countries showed that 62% of all neonatal deaths occur in the first three days after birth, two-thirds of which occur on the first day alone³. Given that a majority of maternal and neonatal deaths occur within the first 48 hours of delivery, it has been well-established that the 48-60 hours around birth is a critical opportunity for targeted interventions.

Most maternal and newborn deaths can be prevented by providing quality care during intrapartum and immediate postpartum period. A number of life-saving interventions, if implemented appropriately during this period by skilled healthcare providers, can help save numerous mothers and newborns. Equipping the providers with knowledge and skills through effective decision-making support tools can help create an environment for mothers and newborns to not just survive, but thrive.



THE ASMAN INTERVENTION

The Alliance for Saving Mothers and Newborns (ASMAN) was thus conceived to avert preventable maternal and neonatal deaths by introducing comprehensive decision support tools, training systems, and innovative technology in maternal and neonatal care in the public sector. In bringing renowned development organizations together for a public health intervention, it fulfilled the crucial SDG 2030 #17 – Partnership for Goals – aimed at achieving transformative change through global inclusive partnerships and cooperation.

Aimed at improving provider productivity, efficiency, and performance, ASMAN harnessed the power of technology enriching monitoring, decision-making and reporting mechanisms.

The program was implemented in 81 high delivery load public health facilities across four districts each in the states of Madhya Pradesh and Rajasthan.

The ASMAN intervention constituted a mix of capacity-building and technology interventions. The capacity strengthening component sought to empower providers with the knowledge and skills to inculcate best practices in maternal and newborn healthcare during the critical first 48 – 60 hours of childbirth. Healthcare providers were trained on Government of India's *Dakshata* module, and post-training, mentoring and support visits were conducted to handhold providers. ASMAN Game, consisting of simulated peripartum case scenarios fostered provider engagement through self-learning, breaking the monotony of the traditional classroom setting. An e-learning platform hosting interactive tools such as training module and Safe Delivery app further encouraged self-learning.

The ASMAN application – a tablet-based monitoring and clinical decision support tool, was meant to enable providers to make informed and evidence-based decisions. The App contained digitized maternity case sheets, e-partograph, and digital registers and reports. The App dashboard – a system-generated tool – presented a visual display of key performance indicators in real time, helping district and state officials in data-driven decision-making. Remote Support Centers were set up at Medical Colleges to provide round the clock real-time support to peripheral facilities which empowered providers to manage complicated cases at the facility thereby reducing unnecessary referrals.



Provider capturing data through ASMAN App

¹WHO, UNICEF, UNFPA, The World Bank, United Nations Population Division. Trends in maternal mortality: 1990 to 2015. Geneva: WHO, 2015

²The World Bank. Levels and trends in child mortality 2015. Washington D.C.: World Bank Group, 2015

³Sankar, M., Natarajan, C., Das, R. et al. When do newborns die? A systematic review of timing of overall and cause-specific neonatal deaths in developing countries. J Perinatol 36, S1–S11 (2016). <https://doi.org/10.1038/jp.2016.27>

IMPACT AND OUTCOMES

The key success of the ASMAN program has been the improvement in the overall maternal and newborn health outcomes at the intervention facilities. From April 2019 to June 2020, data derived from the ASMAN App dashboards showed a reduction in facility-based fresh stillbirth rate⁴ from 7 to 6.4 stillbirths per 1000 live births in Madhya Pradesh, and from 7.6 to 6.7 in Rajasthan.

Periodic assessments indicated progress in adherence to clinical standards on quality of peripartum care⁵ at facilities. During final assessment conducted in February 2020, providers on average met 58% of 19 clinical standards of care in Rajasthan (as compared to 3% in Nov'17) and 53% in Madhya Pradesh (as compared to 11% in Nov'17).

Postpartum monitoring also witnessed a considerable improvement in both states across parameters such as assessment of maternal conditions of uterine tone and body temperature, and newborn temperatures and respiratory rates. Sustained policy advocacy for improving facility readiness translated to some degree of success, with visible overall improvements in the labor room environment and availability of supplies.

Dakshata, clinical skills trainings and post training mentoring and supervision visits have enhanced providers' adherence to recommended clinical practices.

One of the most crucial successes of the ASMAN app has been its perceived usefulness for government officials and providers alike. The digital platform capturing and analyzing client data, alerting providers and notifying doctors on high-risk cases, providing monitoring support has created an enabling environment for prompt decision-making at various levels of the public health system.

KEY TAKEAWAYS

The governments of Madhya Pradesh and Rajasthan acknowledged the success of the program and its potential in improving maternal and newborn health outcomes during peripartum period. Considering the favorable outcomes of the program, both state governments set aside funds for scaling ASMAN to other districts and facilities. Continued maintenance support was provided by the project to aid the governments in sustainability and scalability of the digital component of the solution.

The pilot program set out to examine the usefulness of leveraging technology in improving maternal and newborn health outcomes during intra and immediate postpartum period. It has shown significant progress in the intervention facilities on improving adherence to recommended clinical practices and decision-making. Training and mentoring support, e-learning, and the tablet-based application have collectively acted as a catalyst for the holistic enhancement of provider performance.

A few challenges that emerged during program closure alluded to the need for overcoming system level barriers and creating a shared understanding amongst providers for greater uptake of technology. Additionally, it was felt that better and frequent communication in such multi-stakeholder initiatives is essential to achieve consensus each step of the way.

Strengthening the healthcare service delivery and system response in public health facilities, which form the first point of entry for most health-seeking individuals at the rural and semi-urban level is imperative to improving overall health outcomes. Empowering the providers with critical skills and knowledge, and equipping the facilities with the necessary infrastructure and resources, is the need of the hour.

This is likely to pave the way for an enabling and conducive environment for providing timely, responsive, and quality intrapartum and immediate postpartum care to all sections of the society, consequently helping avert preventable maternal and newborn deaths.

⁴The overall still birth rate in Madhya Pradesh, however, witnessed an increase during the Covid-19 wave in 2020, owing potentially to the increased burden on the healthcare systems.

⁵A Periodic Assessment (PA) tool, containing 19 standards of quality of care in the intra- and immediate post- partum period, was used quarterly to assess the practices followed at the facilities. Adherence to the recommended practices was assessed through a set of verification criteria by observing client interactions, demonstrations, provider interviews, case records, etc.



2. PROGRAM BACKGROUND

India has made significant strides in addressing the issue of maternal deaths in the country over the last three decades. By reducing the maternal mortality ratio (MMR) from 556 in 1990 to 113 per 100,000 live births in 2016-18⁶, India's Millennium Development Goal on reduction of MMR was successfully achieved. We have also witnessed measurable improvements in tackling neonatal mortality in the recent past, bringing down our share of global newborn mortality from one third of neonatal deaths in 1990 to less than a quarter in 2017.⁷

Despite improvements in maternal and newborn health indicators, however, there is still much to do. Some parts of the country including Bihar, Madhya Pradesh, Odisha, Rajasthan, and Uttar Pradesh continue to battle relatively higher rates of maternal mortality even today. With about 2040 newborn deaths occurring every day⁸ in India, there is enough proof to suggest we have our work cut out for us. Every life that we continue to lose each day to preventable causes makes a compelling case for bolstering our efforts.

Evidence shows that the first 48 to 60 hours during birth provide a critical window of opportunity for focused interventions to reduce preventable deaths of mothers and newborns. A significant proportion of infant deaths in India are found to occur in the initial few days after birth, imploring urgent attention through targeted approaches.

ASMAN was established to leverage this window of opportunity and facilitate improvement in the quality of intrapartum and immediate postpartum care that would save the lives of mothers and their newborns.

AN INNOVATIVE IDEA FOR IMPROVING MATERNAL AND NEONATAL HEALTH OUTCOMES

ASMAN traces its genesis to 2015, when it was formed with the vision of enabling healthcare providers to provide better quality of care during childbirth. Multiple stakeholder meetings, ideation, assessment of existing programs, landscape analysis, and the like preceded the subsequent roll-out of the Alliance for Saving Mothers and Newborns (ASMAN) in 2017.

Recognizing the importance of critical interventions during intrapartum and immediate postpartum period to avert the preventable deaths of mothers and newborns, ASMAN sought to build on the existing efforts of the Government at the national and state levels and encourage the use of evidence-based best practices for providing better quality of services in public health facilities.

Technology-enabled care has the potential to improve health outcomes. Empowering healthcare professionals with cost-effective and user-friendly technologies is linked with increased accountability, productivity, efficiency, and traceability⁹.

ASMAN was thus created to leverage the potential of technology-based solutions for achieving impact-driven change in the quality of maternal and neonatal care in public health facilities. A one-of-a-kind partnership thus came into being, creating a comprehensive electronic health record system aimed at strengthening the delivery of intrapartum and postpartum care.

⁶https://censusindia.gov.in/vital_statistics/SRS_Bulletins/MMR%20Bulletin%202016-18.pdf

⁷<https://www.unicef.org/india/what-we-do/newborn-and-child-health>

⁸<http://vikaspedia.in/health/nrhm/national-health-mission/india-newborn-action-plan>

⁹Deloitte. Connected Health. How digital technology is transforming health and social care. <https://www2.deloitte.com/uk/en/pages/life-sciences-andhealthcare/articles/connected-health.html>

AN UNIQUE ALLIANCE AND PARTNERSHIP

“ASMAN can serve as an exemplar of how different philanthropic organizations – both domestic and international – can work collaboratively to align their strengths for achieving a shared goal. This alliance, through its focus on digital innovations, coupled with capacity building, has played a key role in improving maternal and newborn health outcomes in public health facilities.”

Mr Arnav Kapur, BMGF

A consortium of partners from the corporate and development sectors constituted an alliance in November 2015 to achieve the outlined objective of improving maternal and newborn health outcomes through a synergistic collaboration between the government, philanthropic organizations, and non-profit and private sectors. The alliance comprised the following partner organizations.

I. BILL & MELINDA GATES FOUNDATION (BMGF):

Guided by the belief that every life has equal value, the BMGF works to help all people lead healthy, productive lives. In India, the foundation focuses on health, sanitation, financial services, and agricultural development, and works with national and state governments, Indian businesses, nongovernmental organizations (NGOs), and development partners to generate economic growth for the benefit of all Indians.

II. MSD FOR MOTHERS:

MSD for Mothers is a global healthcare leader working to help the world be well through its innovative health solutions. MSD in India is committed to the cause of reducing maternal mortality. With its already functional 'MSD for Mothers' program, the company brings extensive technical and technological expertise for creating and implementing relevant interventions from its existing programs in India, Uganda, Senegal, Zambia, and the US.

III. RELIANCE FOUNDATION (RF):

Reliance Foundation is a not-for-profit company engaged in philanthropic initiatives, focusing on Rural Transformation, Health, Education, Sports for Development, Urban Renewal, Arts and Culture with the objective of transforming lives of people in a sustainable manner. As part of its health initiatives, RF has initiated a Maternal and Child Health program (RF MCH) that has been actively engaging with the community to provide women- and children- related health services through outreach services, organised camps and trained community representatives in urban and rural areas across several states. The program also focuses on strengthening existing government facilities in provision of reproductive and child health services.

IV. TATA TRUSTS:

Tata Trusts are public charitable Trusts focussing on rendering charitable work in various fields. Through the century, the Tata Trusts have constantly endeavoured to achieve societal and economic development for attaining self-sustained growth relevant to the nation. They support an assortment of causes such as health, nutrition, education, water and sanitation, livelihoods, social justice and inclusion, skilling, migration and urbanisation, environment, digital literacy, sports, arts, craft and culture, and disaster management to name a few.

Tata Trusts seek to empower, enable and transform communities across India, while improving the quality of life of the tribal, underserved, underprivileged, backward and minority sections, and laying special emphasis on women and children.

V. UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT (USAID):

USAID/India funds activities implemented under contracts and grants with non-government organizations, public international organizations, and in collaboration with the Government of India. USAID support to maternal and child health focuses on high-impact interventions during a mother's most critical 24-hour period around labor, delivery, and post-partum. To save both mothers and new-borns, USAID is working to increase access to and availability of skilled providers for deliveries, comprehensive and integrated antenatal care, and immunizations for children.

"There was a clear demarcation of roles and vision laid out for all the implementing partners. Each organization took on responsibilities suited to their strengths. The alliance model, and the synchronized efforts of all partners is what made the program successful."

Ms Moni Sagar, USAID

The creation of ASMAN in 2015 brought together a consortium of partners committed to a common goal of helping India move towards Sustainable Development Goals (SDG) 3.1 and 3.2 to reduce MMR and end preventable deaths of newborns.

Through the alliance model, the development partners brought their unique strengths and expertise to the table for ensuring effective implementation of the program.

Jhpiego was the lead implementation agency. ASMAN App was developed by Avalon Information Systems and ASMAN Game was designed by Bodhi Health Education. The external evaluation of ASMAN intervention was carried out by Sambodhi and communication activities were supported by Edelman.

A Program Management Unit (PMU) was set up for the execution and smooth implementation of the program on ground. The PMU governed the day-to-day activities of the field implementation agencies to achieve the program deliverables within the stipulated timeframe. It also represented ASMAN Alliance at government meetings, conferences, and other forums.

The ASMAN Alliance worked closely with its key stakeholders – Governments of Madhya Pradesh and Rajasthan for the implementation of the program.

AN INSPIRING VISION

ASMAN was driven by the overarching goal of reducing preventable deaths of mothers and newborns. The conviction that better clinical practices, and enhanced provider knowledge and skills can play a vital role in improving the quality of maternal and newborn care during labor, delivery and the first 48-60 hours after birth contributed to the design and impetus of the program. The alliance sought to introduce technology in public health facilities as a key catalyst to achieve this, by building on the existing efforts of the Government of India.

THE PRIMARY OBJECTIVES OF THE INTERVENTION DEFINED AT THE OUTSET WERE:

- Improve adherence to effective clinical practices during intra- and immediate post-partum care through technology-driven competency-building and standardization interventions.
- Drive adoption and use of innovative technological, product and process solutions to improve provider performance through trainings.

"ASMAN is an investment designed for achieving impact and improving maternal and newborn health indicators in the public health facilities. It addressed the challenges observed in previous initiatives, which arose from working in siloes, lack of a holistic approach in addressing labor-related issues, and limited focus on strengthening provider/ facility response to cases with complications."

Ms Pompy Sridhar, MSD for Mothers

3. INTERVENTION DESIGN

The ASMAN program was carefully designed following a series of consultations between the alliance partners, meetings with government stakeholders, and workshops/ interviews with public health and technology experts. The guiding principle was to drive an evidence-based intervention through capacity building and mentoring of healthcare providers with technology as an enabler. With improved healthcare worker capacities and adoption of technology, ASMAN intended to pioneer transformations in efficiency and quality of facility-based services.

An integrated approach was adopted comprising of building healthcare providers' capacities and use of technology for monitoring & decision making to provide better quality of care.

Through this unique model, ASMAN App – a tablet-based monitoring and decision support tool during intrapartum and immediate postpartum care was rolled out in 81 public health facilities across 8 districts of Madhya Pradesh and Rajasthan.

“ASMAN is perhaps one of few interventions carried out at this scale and level in the public health sector. The adoption of technology at facilities was achieved through sustained training and mentoring. Despite challenges encountered during different stages of implementation, ASMAN model has demonstrated success.”

Ms Nupur Bahl, Reliance Foundation

CAPACITY STRENGTHENING

The core idea of ASMAN stemmed from the belief that strengthening the capacity of healthcare providers in public health facilities can bring about transformative change in the quality of care (QoC) extended to mothers and newborns during and immediately after delivery.

A combination of trainings and mentoring support formed the bedrock of this initiative. It sought to empower providers with the knowledge and skills to adhere to recommended clinical practices in routine cases, as well as those with complications.

CLINICAL SKILLS TRAINING

One of the critical areas of intervention under this program was equipping Medical Officers, Staff Nurses, and Auxiliary Nurse Midwives (ANM) with the competency to improve labor room practices. To meet this end, the Government of India's *Dakshata* initiative presented a tremendous opportunity for ASMAN to adopt and build on.

Healthcare providers at the chosen facilities were trained through an intensive clinical skills standardization training to inculcate evidence-based best practices consistent with established labor room protocols and standards. These training efforts constituted a fundamental pillar of the program intervention aimed at improving maternal and newborn health care practices.

MENTORING AND SUPPORT VISITS

The ASMAN model incorporated regular follow-up, and mentoring and support visits (MSV) to supplement the trainings. A comprehensive checklist was created and referred to during these visits by the program team. This allowed them to ensure the translation of the acquired skills into practice. They assessed the case records,

case sheets for discharged/ referred cases, supply status of labor room, and facility readiness to evaluate the factors impinging on the provider performance and facility outcomes. These visits also provided an opportunity for the program team to handhold the providers wherever necessary, helping them adhere to essential clinical practices.

Periodic Assessments (PA) formed a regular component of the program. A PA tool was used to collect data on resource availability, labor room standards, and 19 specific standards of QoC in the intra- and immediate post-partum period at the facilities.

“It is important to acknowledge the indispensability of catalysing factors to achieve transformative change through technology. Training and consistent mentoring and handholding support are imperative for behavior change and inculcation of best practices. It is this combination of capacity-building and use of technology that has been instrumental in the success of the ASMAN initiative, and critical for effecting sustainable and scalable impacts.”

Dr Anchita Patil, BMGF

E-LEARNING PLATFORM

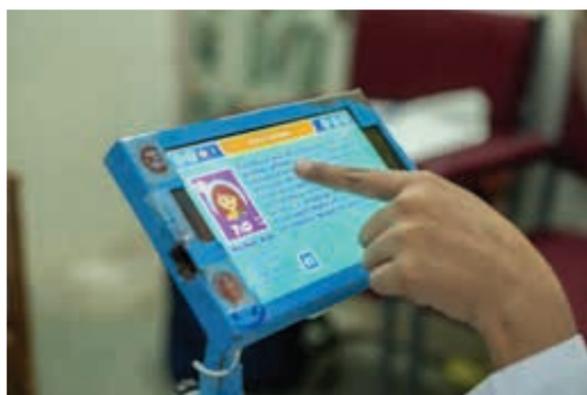
ASMAN’s e-learning platform built into the ASMAN App, hosted a variety of tools to improve the knowledge and skills of the healthcare providers. It was designed to encourage self-learning through interactive and audio-visual components including a game, tutorials, and a safe delivery app.

“Constant use of ASMAN app and its e-learning features has increased our confidence and allows us more time for patient care. The training modules include a variety of diverse scenarios, helping us understand and inculcate best practices in the management of different cases. We are now able to give focused attention to mothers and newborns.”

Ms Ashwini Sarathe, Staff Nurse, DH Vidisha, MP

ASMAN GAME

Acknowledging the potential impact of game-based modules for self-learning, the ASMAN program developed gamified learning modules to aid healthcare providers in critical thinking and decision-making and help them practise evidence-based case management. The ASMAN game consisted of 29 simulated real-life case scenarios related to pregnancy and childbirth (including cases with complications) presented through interactive and engaging gameplay in English and Hindi.



Provider playing interactive ASMAN Game

An in-built dashboard allowed monitoring of the user’s progress, with insights into completed levels, time spent and performance score. This proved to be a vital indicator of the knowledge and skills acquired, helping customize further learning paths wherever needed. A certificate for the user was generated within the app on completion of all levels of the game.

From April 2019 to May 2020, over 700 users utilized the game module for self-learning.

TRAINING MODULE

A comprehensive training module, comprising the Government of India’s guidelines and tutorials, promoted self-learning through a variety of audio-visual and descriptive content covering 39 pregnancy-related topics. This repository incorporated components of the *Dakshata* initiative, as well as COVID-19 management guidelines for reference, which provided particularly crucial support during the pandemic.

SAFE DELIVERY APP

Developed by the Maternity Foundation, University of Southern Denmark, and University of Copenhagen, the safe delivery app was adapted to the Indian context and integrated into the ASMAN platform. It served as a remarkable on-job reference tool, helping the providers keep their knowledge on maternal and neonatal health topics periodically updated.

Through this app, providers could easily and readily access evidence-based, updated clinical guidelines on basic emergency obstetric and neonatal care that could help save lives by making critical information available in real time.

INNOVATIVE TECHNOLOGY

The ASMAN App was developed following various sessions of brainstorming, landscaping of facilities, and end user persona analysis. There was a defined need for a behavior-driven development approach for the software development that would ensure user-friendliness and easy adaptability to logistical challenges (especially common in rural areas) such as those related to internet access.

After an exhaustive analysis of the on-ground conditions, requirements, and specifications for the development of the App were finalized. MCH case sheets and e-partograph were integrated, and wireframes and mock-ups of the App were developed. The basic architecture for the App and server was finalized before the pre-alpha version of the App was rolled out. ASMAN application was designed with a robust underlying architecture, supported by micro services for better agility. Feedback from User Acceptance Tests (UAT) during pre-alpha, alpha and beta versions aided in further improving the existing interface in the form of updates and new features implemented through iterative releases. These changes to the software were seamlessly consumed by all the stakeholders involved.

The ASMAN app also consisted of Remote Support Center (RSC) and a program dashboard module.

“There is a general misconception that those at peripheral health facilities will be averse to using technology. This is, however, not true. Technology, when delivered through the right approach including training and mentoring support, and advocacy on its benefits, it is well-received, and it works!”

Dr Sita Rama Budaraju, TATA Trusts

ASMAN APPLICATION

The ASMAN application was at the core of the program efforts aimed at strengthening decision-making capabilities of providers at the facilities. It is an innovative tablet-based clinical decision support tool that provided real-time assistance to healthcare providers for making informed and evidence-based decisions during the intrapartum and immediate postpartum period. The ASMAN App also enabled Electronic Health Records for intra and immediate post-partum period at intervention facilities.



A staff nurse using the ASMAN app

The design of the Application Programming Interface (API) for the app with a robust underlying architecture ensured that it was a generalized app that can be connected to any government portal or application. By simply registering it on ASMAN’s backend database and setting up a security channel, it would enable the immediate interaction of any two systems. This was intended to ensure seamless adaptability and future management.

The application, developed through an agile methodology with a functional interface, is a pioneering effort in the field of maternal and neonatal health, designed with the intent of enhancing provider productivity and reducing the burden of use of paper-based work through digitized records.

DIGITIZED MATERNITY CASE SHEETS

The digitization of maternity case sheets under ASMAN provided nurses with a platform to enter client data in real-time, which was backed up immediately and made available for remote access within the same facility. This feature was integrated with the Safe Childbirth Checklist – a step-by-step instruction guide comprising clinical rules – adapted from the World Health Organization (WHO).

If the parameters entered were beyond the normal range, auto-generated alerts and notifications aided healthcare providers to respond quickly to such high-risk cases.

The digitized platform helped improve provider performance and productivity, as it allowed the providers to spend more time on patient care that was earlier being spent on documentation.

E-PARTOGRAPH

Paper-based partograph in use at the facilities before the introduction of e-partograph posed functional challenges. Plotting through graphs on paper was tedious, complex, and susceptible to errors in data-entry. Thus, the e-partograph feature was developed to support automatic plotting, generate alerts and notifications on abnormal vitals and complications, and share performance-enhancing analytics.



E-Partograph

“Our facility has really benefited from the e-partograph - eliminating the previous trend of manual plotting. The monitoring of key vitals has improved, leading to better maternal and neonatal outcomes. This has impacted our referral rate, which has reduced from 60-70 per month to 25-30 per month. The facility has gained newfound respect and appreciation that is heartening.”

Dr Deepak Paldiya, Block Medical Officer,
CHC Jaora, MP

DIGITAL REGISTERS AND REPORTS

The digitization of registers and reports under ASMAN stemmed from the key goal of reducing workload of the healthcare providers and facilitating lean management at the facilities. This was designed by collating information on the various physical registers being maintained in the labor rooms. It sought to improve system efficiency by ensuring data accuracy, and enabling providers to spend more time on patient care and less on recording and reporting case details.

“Before the ASMAN intervention, we had to fill up 30 pages of case sheets per patient, which was an extremely time consuming and repetitive process. Now, the case sheets are digitized, helping us save a lot of time that can be spent on patient care.”

Ms Janet Solanki, DH Ratlam, MP

Over 22 labor room registers, and reports have been digitized in the ASMAN App, integrating information from admission till discharge during labor. Mechanism for real-time reporting by facilities also allowed monitoring of facility progress and performance by facility managers and officials at the district and state levels, aiding in enhanced decision-making at the policy level.

“A lot of our time earlier was spent on maintaining different registers for admission, delivery, discharge, refer-outs, and the like. Now, we only need to enter basic details in the digital register, which gives us access to the entire case information. My work has benefitted immensely, as the dashboard sorts the data periodically that I can access depending on my requirement. I am able to manage my time much better. It gives me great pleasure when a mother and her baby leave happy and healthy.”

Ms Preeti Katre, Staff Nurse, DH Vidisha, MP

The digital registers and reports can be accessed through the app on the tablets provided at the facilities, as well as through a password-protected web application.

REMOTE SUPPORT CENTRE (RSC)

Remote Support Centers (RSC) were created with Standard Operating Procedures (SOP) to provide round-the-clock specialized support to peripheral facilities through specialist doctors based in medical colleges. The providers at the facilities could make direct voice calls from the ASMAN App to the RSC, share relevant digital case records in real time, thereby receiving guidance and decision-making support to manage complicated cases.



A staff nurse connecting to a Remote Support Center

The RSCs sought to enable continuity of care and initiation of correct treatment without delays during the intrapartum and immediate postpartum period, reducing avoidable referrals in the process.

DASHBOARD

The ASMAN program, to improve data-driven decision-making for better maternal and newborn health outcomes, created a system-generated live dashboard. It was integrated into the application and aggregated at the district and state levels, and offered a visual display of the key performance indicators (KPIs) of the program and real-time insights into cases and patient information.

This enabled program managers, government officials and other key stakeholders to monitor and analyze the trends, identify challenges, and implement timely interventions. The dashboard played an instrumental role in ensuring better availability and interpretation of data. This in turn supported enhanced decision-making at the policy level, and greater transparency and accountability among all stakeholders, culminating in improved program outcomes.

ASMAN can be integrated with the Indian government's maternal health online portals such as MCTS (Mother Child Tracking System), PCTS (Pregnancy, Child Tracking & Health Services Management System) and RCH (Reproductive and Child Health) and the data can be included into these portals via APIs. Additionally, ASMAN can access details of pregnant women from these portals and integrate the data in its own system using custom APIs. It can also be integrated with the government's national newborn online portal – SNCU (Special Newborn Care Unit). ASMAN application modules are tightly aligned, loosely-coupled to facilitate interoperability and scalability and are future ready with minimal effort.



4. PROGRAM IMPLEMENTATION

Madhya Pradesh and Rajasthan, with relatively higher neonatal and maternal mortality rates in the country, were chosen for the program implementation in line with recommendations from the Ministry of Health and Family Welfare (MoHFW). The neonatal mortality rates in Madhya Pradesh and Rajasthan when ASMAN was launched stood at 32 and 38 per 1000 live births respectively. At the same time, the MMR per 100,000 live births in Madhya Pradesh was 173, and 199 in Rajasthan.

Consultations with the respective State Governments helped identify the specific districts with high rates of maternal and neonatal mortality, and facilities with a high case load of 50 or more deliveries per month.

At the end of the consultations and initial assessments, 81 facilities across four districts in each of the two States were selected for the implementation of the program. These facilities were also chosen as they were yet to implement Government of India's programmatic efforts aimed at improving quality of care.

TIMELINE AND GEOGRAPHICAL COVERAGE

The program was implemented from June 2017 to May 2020. The program covered Jabalpur, Khargone, Ratlam and Vidisha districts in Madhya Pradesh and Ajmer, Bhilwara, Kota and Jhalawar in Rajasthan.

The program covered District Hospitals (DH), Sub-District Hospitals (SDH), Community Health Centers (CHC), and Primary Health Centers (PHC).

LANDSCAPING, FIELD VISITS, AND RAPID ASSESSMENT OF FACILITIES

To design an intervention for optimal improvement of provider capacity and facility preparedness, extensive landscape assessment was undertaken.

Joint field visits were made by Jhpiego and Avalon to the DHs, SDHs, CHCs and PHCs across Madhya Pradesh and Rajasthan. The program team interacted with several key personnel at the facilities, including the facility-in-charge, labor room in-charge, other labor room staff, and data entry operators.

This was followed by an understanding of the processes and infrastructure at the facilities. The process of patient flow in the maternity wing from admission to discharge was carefully mapped. An assessment of existing information technology (IT) systems at the facility was also carried out to evaluate its readiness for rolling out ASMAN App at the facilities.

An analysis of the challenges that manifested in the recording and monitoring of vitals, plotting of partograph, and management and referral of clients was additionally carried out during the field visits.

A rapid assessment of the facilities including their functionality and preparedness, through various tools (including interviews, observation, records and reports, and triangulation), sought to assess:

- the status of human resources and training status
- the availability of essential resources such as drugs and equipment in the labor rooms
- the quality of maternal and neonatal care during intrapartum and postpartum periods

Learnings from the landscaping and rapid assessments informed the strategy and plan for the program implementation.

DAKSHATA TRAINING OF HEALTHCARE PROVIDERS

ASMAN adopted Government of India's *Dakshata* initiative aimed at improving the capacities of healthcare providers to provide quality peripartum care. An initial Training of Trainers (ToT) was organized in the program states, creating a pool of 18 master trainers in Madhya Pradesh and 10 in Rajasthan.

Over 1200 healthcare providers were trained on clinical skills pertaining to essential maternal and neonatal health. Average score of participants on key maternal and newborn health skills increased by 90 percentage points in Rajasthan and 80 percentage points in Madhya Pradesh.

APPLICATION ROLL-OUT AND SETTING UP OF RSCS

The application roll-out, carried out in a phased manner in 2018, went through the pre-alpha (Mar-Jun), alpha (Jul-Sept), and beta (Oct-Dec) stages. The final release took place between January and April 2019. Following the app roll-out, the providers were trained and prepared on application modules, handheld to support consistent and continuous use, and also provided subsequent maintenance support throughout the program.

A half-day orientation was conducted to introduce the application and its use to the providers, who continued practising various case scenarios on a demo app. Intensive mentoring support and training improved provider confidence in using the app. The providers were periodically trained and reoriented on subsequent changes and introduction of new modules in the application.

Four Remote Support Centers were established – one at the MY Medical College, Indore in Madhya Pradesh; and three in Rajasthan at the Medical Colleges in Ajmer, Jhalawar and Kota – to provide on-demand support for complicated and high-risk cases at the facilities. To ensure feasibility, cost-effectiveness, and sustainability of this initiative, Government Medical Colleges were chosen to host the RSC, with OB/GYN specialists extending real-time support. It was a strategic choice made with the additional intention of overall health system strengthening.

REVIEW AND FEEDBACK

The ASMAN intervention model incorporated vigorous review processes and mechanisms at various levels and stages of the program implementation. Periodic facility level meetings saw the participation of the medical officer-in-charge, and labor room in-charge and staff. At these meetings, key maternal and newborn health indicators were reviewed using ASMAN application dashboard, and action plan with timelines was prepared to address the gaps identified during PAs and mentoring visits.

District level meetings were also conducted regularly, with the objective of reviewing the performance of the facilities, unraveling the challenges being faced by officials and providers, resolving administrative and supply chain issues, and sharing lessons on good practices.

State level review meetings conducted in both states by Principal Secretary and NHM Mission Directors provided an opportunity to review the key performance indicators using ASMAN App dashboards and findings from periodic assessments and external evaluation studies.

These review meetings facilitated constructive dialogue and monitoring at various levels, aiding better engagement of the policymakers and providers, as well as accelerating immediate and affirmative action wherever required.

PROJECT RESPONSE TO COVID-19

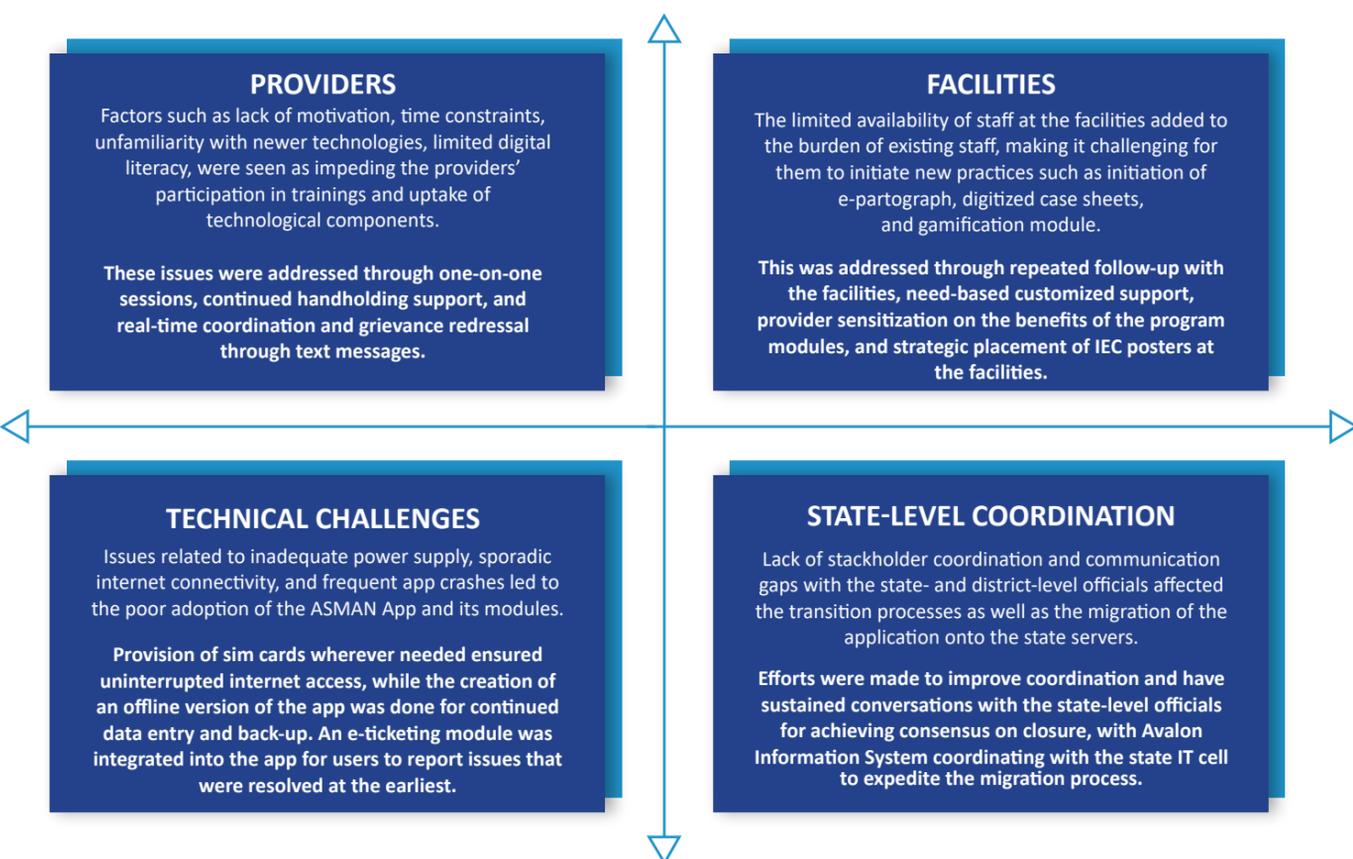
As the COVID-19 pandemic hit and the country went into complete lockdown, the program team was quick to respond to requests of the State governments to conduct online capacity-building of providers. Over 900 healthcare providers in Madhya Pradesh and Rajasthan were oriented on 'maternity care and preparedness of hospitals for COVID-19 pandemic'. Online orientations on COVID-19 were also conducted for the Chief Medical and Health Officers, and District Program Managers via videoconferencing.

The intervention facilities were given remote support when required, and the providers were encouraged to leverage the e-consultation provision under the RSC model to treat complicated and/ or high-risk cases, helping curb unnecessary referrals. A repository of information and guidelines on COVID-19 and maternal and neonatal health services created by the Government of India, Indian Council of Medical Research (ICMR), Federation of Obstetrics and Gynecologists Societies of India (FOGSI), World Health Organization (WHO) and others was built into the ASMAN App for the reference of the providers.

In addition, animated videos and action cards informed providers on the technical aspects of managing COVID-19 positive pregnant women and infection prevention. This COVID-19 specific module was integrated into the Safe Delivery App of the ASMAN application.

CHALLENGES AND MITIGATION STRATEGIES

Like any intervention program that seeks to transform existing structures, ASMAN too, had its share of challenges at different stages of implementation. These presented an opportunity for extensive learning, and were mitigated through appropriate and timely course-correction. Some of the broad challenges and corresponding mitigation strategies are presented here.



Key challenges in program implementation and the mitigation strategies



5. IMPACT

The independent evaluation study of ASMAN sought to assess the effectiveness and impact of the ASMAN intervention in improving the quality of maternal and neonatal care at the facilities, as well as the role of technology in improving the overall health outcomes. In addition, it attempted to identify the facilitating and limiting factors in program implementation to analyze the scope of its scalability and sustainability.

The evaluation framework synthesizes information on the program components, implementation model, and findings of primary and secondary data. It is designed to generate evidence on the effectiveness of the program through insights into transformations in provider practice, knowledge and skills, improvement in facility readiness, and other key lessons learnt.

The assessment of changes in QoC indicators was carried out through primary data collected during baseline, midline and endline evaluations. Owing to the challenges posed by the COVID-19 pandemic, only a limited number of intervention facilities from Rajasthan could be included in the endline evaluation. Secondary data collected over a two-year period from the ASMAN dashboard, facility registers, qualitative interviews, and implementation research was analyzed to assess the impact on outcome indicators and unravel the factors affecting the technology uptake.

The baseline, midline, and endline evaluations in Rajasthan were conducted in November-December 2017, March-April 2018 and October 2019-February 2020 respectively. In Madhya Pradesh, the baseline evaluation was carried out in the period January-April 2018, while the midline evaluation was carried out between March-April 2019.

Presented below are findings from the endline evaluation from Rajasthan and the midline evaluation and Periodic Assessments from Madhya Pradesh.

Improvement in Quality of Care

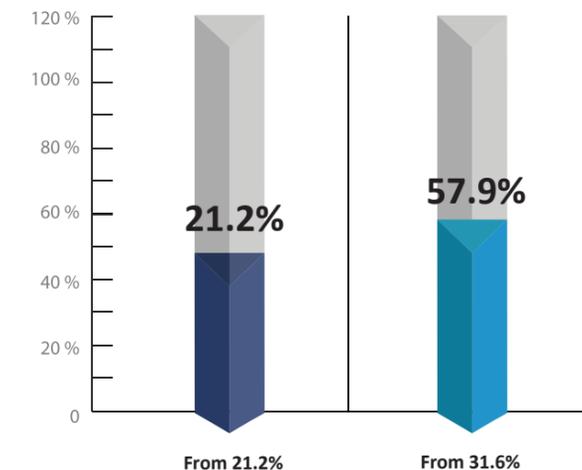
The ASMAN intervention has proved to be an impactful investment creating positive transformations in the maternal and neonatal health scenario in public health facilities. It has sought to bridge a critical gap in service delivery that has hitherto existed in intrapartum and immediate postpartum care, in the form of limited provider skills and facility preparedness. It addressed the challenges posed by siloed approaches to improving patient care and provider capacities, lack of a holistic focus on the entire birthing journey, and absence of innovative mechanisms to deal with complicated and high-risk cases.

Knowledge and Skills

ASMAN sought to improve the knowledge and skills of the healthcare providers through the *Dakshata* training and mentoring visits, while increasing adherence to standard clinical practices and protocols.

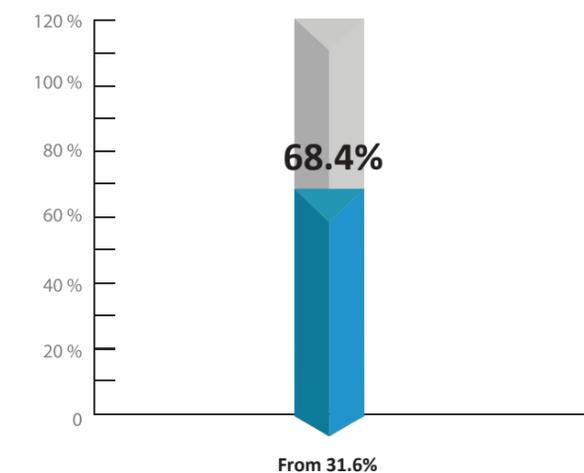
In Rajasthan, provider knowledge associated with initial assessment of labor showed improvement. Knowledge of abdominal examination grips increased from 21.2% in midline to 47.4% in endline evaluation, while knowledge of danger signs during admission of mothers increased from 31.6% in midline to 57.9% in endline. Knowledge surrounding Routine Newborn Care (RNBC) and Active Management of Third Stage of Labor (AMTSL) increased from 31.6% in midline to 57.9% and 47.4% during the endline evaluation respectively.

Knowledge associated with initial assessment



Skill indicators during initial assessment also witnessed an overall improvement. Skills related to following critical steps in abdominal examination improved from 10.5% in midline to 57.9% in endline, while RNBC skills improved from 31.6% in midline to 68.4% in the endline evaluation.

Skill indicators



In Madhya Pradesh, a comparison of knowledge and skills of nurses in ASMAN and non-ASMAN facilities was conducted during midline assessment. Findings revealed that, knowledge of nurses on stating '4 or more danger signs on admission' ($p < 0.05$), '4 or more risk factors associated with high-risk delivery', 'frequency of monitoring partograph components' and 'high blood pressure as a danger sign' was better in ASMAN facilities as compared to non-ASMAN facilities.

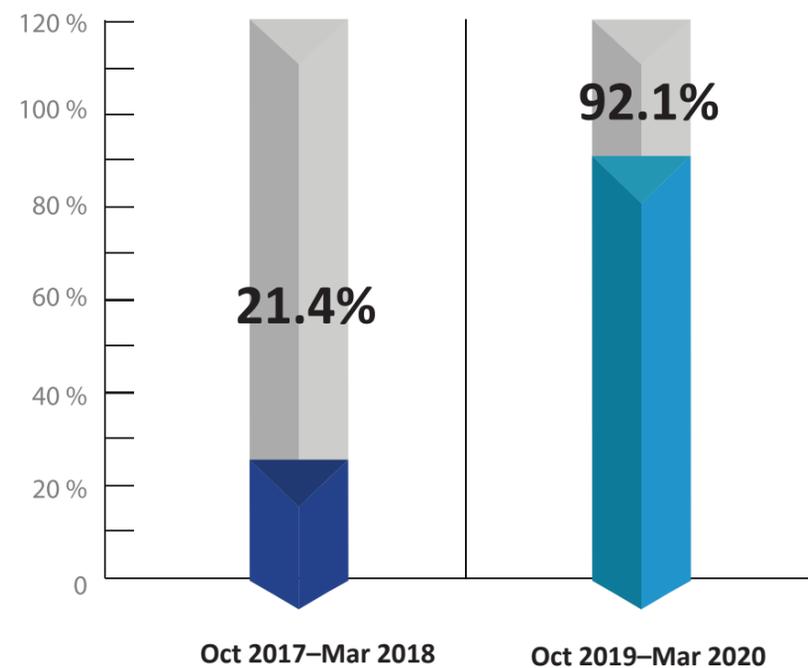
Practices during Normal Labor and Birth

The overall adherence to recommended clinical practices witnessed a manifold increase, translating into improvements in QoC and increased provider sensitization on respectful maternity care and client rights.

Active Management of Third Stage of Labor (AMTSL)

Practices related to the active management of third stage labor comprised three components: a) administration of oxytocin immediately after birth; b) controlled cord traction to deliver the placenta; and c) massage of the uterine fundus after the placenta is delivered.

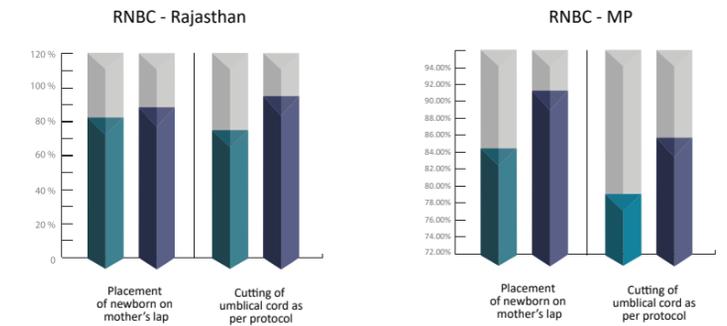
An improvement across all the three steps of AMTSL was noted, from 52.1% in baseline to 72.5% in the endline evaluation in Rajasthan.



As part of the periodic assessment data, it was noted that Madhya Pradesh witnessed improvement in the performance of AMTSL practices, from 21.4% in Oct 2017–Mar 2018 to 92.1% in Oct 2019–Mar 2020.

Routine Newborn Care (RNBC)

RNBC practices involve the steps immediately after birth, including placing the newborn on the mother's abdomen, using a dried towel/ cloth to clean newborn, clamping, and cutting the umbilical cord as per protocol, breastfeeding, and weighing the newborn.



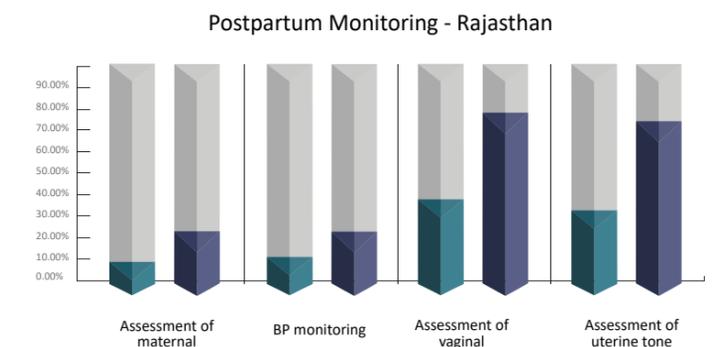
While most of the indicators around RNBC demonstrated some degree of saturation, indicators that underwent notable improvements in Rajasthan included placement of newborn on mother's abdomen – changing from 83.3% in baseline to 89.4% in endline; and clamping and cutting of umbilical cord as per protocol which increased from 76% in baseline to 97.5% in the endline evaluation.

In Madhya Pradesh, practice related to placement of newborn on mother's abdomen increased from 84.5% in baseline to 91.7% in midline after ASMAN intervention, while the practice of clamping and cutting of umbilical cord underwent a marginal increase from 79.2% in baseline to 85.8% in the midline evaluation.

Postpartum Monitoring

Positive trends were observed in maternal and neonatal postpartum monitoring practices in both Madhya Pradesh and Rajasthan.

In Rajasthan, marginal changes were noted in assessment of maternal temperature – from 7.8% in baseline to 21.5% in endline – and BP monitoring which changed from 12% in baseline to 21.5% in endline. Assessment of vaginal bleeding and uterine tone witnessed a significant increase from 38% and 33% in baseline to 78% and 74.5% in the endline evaluation respectively.



In Madhya Pradesh, postpartum care practices were found to be better at ASMAN facilities across all indicators, as were the knowledge on postpartum monitoring and postpartum hemorrhage management skills.

“With real-time data entry in the app, the doctors are able to instantly access and monitor the patient’s vitals, and respond with promptness to critical situations. With the help of ASMAN, we have been able to reduce maternal and neonatal deaths at the facility. When I see that a mother and her baby are leaving happy and healthy from the facility, I feel content that the hard work has paid off and my purpose fulfilled.”

Ms Ajitha, Staff Nurse, DH Vidisha, MP

Complicated Deliveries

ASMAN aided in identifying and responding to complicated cases through improved knowledge and decision-making skills. Healthcare providers alluded to application modules including e-partograph, RSC, and ASMAN game as playing a crucial role in helping them diagnose and treat complications with improved confidence and competence.

“Nursing staff at times used to forget the sequence of actions to be prioritized. The pop-up alerts and notifications in the ASMAN app now help substantially in streamlining the case details, and taking appropriate action. Now that the data is easily accessible and centralized, they are able to take appropriate action and follow step-by-step protocol while managing complicated cases.”

Dr Samar Iklas Khan, Medical Officer, PHC Shivgarh, MP

Referral of Complicated Cases

The ASMAN app sought to ensure seamless referral linkages between the intervention facilities and tertiary care facilities by enabling timely communication and thus reducing the second and third delays. The digitization of case sheets and RSC module contributed to the smooth transition that notified the refer-in facilities on key information and ensured facility-readiness.

“When my wife went into labor and developed complications, she had to be transferred to another facility. All the information pertaining to her case had arrived even before us at the refer-in facility, due to which they were adequately prepared and treated her complication successfully. I am grateful for the timely intervention, due to which both my wife and baby are healthy.”

Mr Deepak Munia, Ratlam, MP

Between April 2018 and March 2020, through the ASMAN application, 12314 referrals were made in Madhya Pradesh and 4289 in Rajasthan. Some of the major reasons for referrals included neonatal complications, prolonged labor, obstructed labor, and severe anemia.

Facility Readiness

One of the key prerequisites for ensuring the effectiveness of the ASMAN intervention was the improvement of the physical infrastructure and resource availability at the healthcare facilities. This was achieved through multiple approaches including sustained policy advocacy with the government representatives, periodic stock assessments, trainings on different aspects of facility readiness, and the *Dakshata* package on essential resources.

“When I was here earlier, there was no designated seating area for the patients, the toilets were unhygienic, and the labor rooms lacked proper lighting and equipment. Now the infrastructure and facility readiness has improved, and the staff are also well-trained and have more time for patient care. The transformations are visible and very promising.”

Ms Radha Rani, Ratlam, MP

Labor Room Environment

Seven standards were used to measure the quality of labor room environment that constituted provision for privacy of the clients, ambience, adequate ventilation and lighting, adequate labor and delivery facilities, appropriate space management, accessible and working washroom, and a functional hand-washing station.

“ASMAN has enabled us to provide excellent quality of care for mothers in the labor room, and better monitoring of vitals. We have facilitated infrastructural improvements in the labor room and placed more beds at delivery points, in addition to upgrading the equipment and other resources.”

Dr Prabhakar Nanaware, Chief Medical Health Officer, Ratlam, MP

The most positive trends in Rajasthan were observed in the provision of privacy, appropriate space management, and adequacy of labor and delivery facilities. Indicators such as labor room ambience and accessible washroom doubled from the baseline to endline assessment.

In Madhya Pradesh, significant improvements were noted in the provision of privacy, appropriate space management and adequacy of labor and delivery facilities.

Availability of Supplies

An analysis of supply and resource availability in 13 intervention facilities in Rajasthan from baseline to endline evaluations revealed that the availability of drugs such as Magnesium Sulphate, Oxytocin, and Vitamin K increased by 9, 20.8, and 8.3 percentage points respectively. There was also a marked improvement in the availability of supplies such as dry towel for newborns, sterile scissors, and IV sets by 39.4, 12.5, and 8.3 percentage points respectively.

Increase in the availability of supplies at facilities in Rajasthan



Dry towels for newborns

Sterile scissors

IV sets

Similar improvements were witnessed in Madhya Pradesh between baseline and midline, with a significant increase in the availability of clean and dry towels for newborns.

Improvement in Health Outcomes

The ASMAN intervention has made significant strides in improving facility-based maternal and neonatal health outcomes through improved clinical decision-making by the providers. The capacity-building trainings and technological interventions have visibly strengthened the intra- and immediate post-partum care provided at the ASMAN facilities, translating into better health outcomes for mothers and newborns.



Reduction in facility-based fresh stillbirths

The incidence of facility-based fresh stillbirths witnessed an overall decrease in the period of program implementation. During April 2019 to June 2020, facility-based fresh stillbirth rate reduced from 7.0 to 6.4 stillbirths per 1000 live births in Madhya Pradesh, and from 7.6 to 6.7 in Rajasthan.



6. SUSTAINABILITY & SCALE-UP

The potential of ASMAN's twin approach of capacity-building and technological support has been well-recognized by the beneficiaries and stakeholder groups alike. Healthcare providers have acknowledged the initiative's effectiveness in saving crucial time and improving decision-making capabilities, while district and state officials have appreciated its role as a crucial monitoring and decision support tool.

The commitment of the governments of Madhya Pradesh and Rajasthan at the program outset, and their willingness to allocate training and infrastructure resources were instrumental in the effective implementation of the program. Since ASMAN adapted Government of India's existing *Dakshata* training package for its capacity-building module, it ensured greater buy-in from the state governments, and provided assurance of its sustainability.

To ensure further continuation and sustenance of the initiative, a holistic transition process was designed, aimed at supporting state governments in taking ownership of and scaling the initiative.

"The on-ground uptake of ASMAN Application was noteworthy. Considering the favorable outcomes of the project, both Madhya Pradesh and Rajasthan Governments allocated funds for the expansion of digital solution to newer facilities and districts".

Mr Pradeep Murthy, PMU

Building State Capacities

Creating a Pool of Master Trainers for Clinical Skills Training and ASMAN App

ASMAN created a pool of Master Trainers for providing training to trainers on the *Dakshata* package for further skilling of the healthcare providers.

A total of 8 Master Trainers in Madhya Pradesh and 10 in Rajasthan were identified and trained at the state level.

Knowledge transfer to States

Meetings with the National Health Mission (NHM) officials of the Madhya Pradesh and Rajasthan governments were facilitated during the conclusion of the program, during which, the State's queries on the future of ASMAN were addressed. These meetings were also utilized to share with the officials, program progress and key takeaways, training packages, monitoring and assessment tools, and the ASMAN inventory.

As a part of knowledge transfer, documents including server configuration document, deployment guide and implementation guide were shared with NHMs Rajasthan and Madhya Pradesh. Additionally, Application migration plan, technology stack & system architecture, final audit report and clearance certificate were shared with NHM Madhya Pradesh.

Training of State IT Cells on ASMAN App Management

Comprehensive training packages on the management of the ASMAN application were developed and shared with the state IT cells of both Madhya Pradesh and Rajasthan. The training packages included information on the system architecture, application walkthrough, user guide, case management, duty rosters, registers and dashboard, and more. Trainings were conducted for Master Trainers & State IT cell. 25 Master Trainers (17 MP + 8 RJ) were trained in both states and 163 Champion providers (84 MP + 79 RJ) were created for the institutionalization of the Application at facility.



MASTER TRAINERS

(17 MP + 8 RJ)
were trained in
both states



CHAMPION PROVIDERS

(84 MP + 79 RJ)
were created for the
institutionalization of the
Application at facility.

Transition of ASMAN App and Database to States

The transition of the ASMAN application onto the State servers involved a detailed migration plan, and extensive coordination with the State governments and the technology partner. ASMAN application was hosted on the State servers of Madhya Pradesh and Rajasthan, final transition including end – to – end testing, database migration and going live on state servers was accomplished successfully.

Government Response and Scale-up Plans

During the review meetings with the health department officials of both State governments, they acknowledged the role of ASMAN in facilitating better monitoring and review of facility performance, which proved consequential in improving the quality of intrapartum and immediate postpartum care.

The program team met with the Mission Directors of NHM in both States to advocate the scaling up of ASMAN. The state governments allocated funds in Program Implementation Plan (PIP) for the expansion of ASMAN solution to newer districts and facilities and sought technical support from the alliance.

The Government of Madhya Pradesh initiated plans to scale up ASMAN in 185 high delivery load facilities across 18 districts, including aspirational and high priority districts, while agreeing to bear the costs of maintenance and sustenance of the intervention facilities. A budget of INR 61 lakhs for replicating ASMAN in 74 new facilities in the four implementation districts was set aside. Further, a budget of INR 2.68 crores was allocated through PIP for scaling it to 259 additional facilities in 22 districts in a phased manner.

“There has been a marked change in the perceptions and attitudes of the healthcare providers at the intervention facilities in Madhya Pradesh. As they can see the data and progress being made in real time, they have developed a sensitive approach that was previously lacking. The ASMAN model holds immense potential if it is reached to all the facilities acting as the first point of contact for women seeking quality health services during intrapartum and immediate postpartum period. Robust and sustained monitoring of the key indicators at the state and facility levels can help better management of cases. ASMAN must be leveraged as an important decision support tool for making a dent in maternal and neonatal mortality rates.”

Ms Chhavi Bhardwaj, Mission Director, National Health Mission, Madhya Pradesh

The Government of Rajasthan proposed scaling of ASMAN to 360 high delivery load facilities across 25 districts, approving a budget of INR 1.5 crores through PIP in a phasic manner and an additional INR 1.5 crores through the Janani Suraksha Yojana (JSY) admin funds was also planned to be leveraged for the expansion of the digital solution. The sustainability of the ASMAN model was well-established through the trained pool of Master Trainers, robust and adaptable architecture of the ASMAN application, as well as the demonstrated intent of the state governments to allocate resources for scale-up.

“What we have created as an alliance has added value to the maternal and neonatal health system on ground. It has seen good uptake, positive transformations, as well as commitment and interest of the State governments in owning and scaling the intervention. What we must keep in mind is to consider leveraging and building on existing programs in the public sector for sustainability and scalability.”

Dr Sachin Gupta, USAID



7. LESSONS LEARNT

The program experience brought to light several enabling and limiting factors in the implementation of ASMAN. The key lessons derived from the intervention help evaluate its effectiveness and sustainability, while helping form recommendations to improve program performance during further replication.

“ASMAN is an excellent initiative that is well-conceived, coordinated, and executed. It is a great learning experience, demonstrating that anything that is planned well, goes well.”

Dr Dinesh Singh, Jhpiego

Multi-stakeholder Collaboration

ASMAN paved the way for a unique alliance between large partner and donor organizations, with two state government as key stakeholders. The involvement of multiple stakeholders – each with individual expertise, influence, and goals – can often lead to conflicting or competing ideas, and priorities. This was also the ASMAN experience, particularly in the nascent stages of ideation and strategy.

The establishment of a **Program Management Unit (PMU)** proved beneficial for the monitoring and smooth execution of the day-to-day activities of the implementation partners. The PMU also played the critical role of regular coordination between program partners and government stakeholders, plugging any potential gaps in communication, achieving consensus, or program continuity.

Multi-level review meetings at facility-, district-, and state- levels particularly had positive outcomes such as better engagement of and dialogue among decision-makers and providers, aiding in quick grievance redressals.

Program Implementation and Scale-up

The implementation of a program aimed at effecting systemic transformations in the existing public sector requires time. It became apparent during implementation that execution of transformative models on ground at government facilities needs **greater handholding support**. This was addressed through the active involvement of the PMU and program teams of the implementation agencies, sustained communication with district and state officials, and the regular focused MSVs for providers at the facilities.

Engagement of the leadership at the facilities and the district proved to be a crucial factor for motivating the staff to work and communicate better as a team, and adapt to the technological changes.

Another important mainstay for technological interventions in remote and relatively underdeveloped areas is logistical and infrastructural resource availability. While some of the hardware was made available by ASMAN, challenges stemming from sporadic access to internet continued to pose problems. Lack of internet access for days at a stretch led to some degree of frustration among users. To tackle this, an offline solution was created and integrated into the app as backup. **Uninterruptible internet access** emerged as one of the core necessities for the program implementation.

The RSC component was envisaged as a valuable platform to extend decision-making support to providers to deal with complicated and high-risk cases, and reduce third delays in intrapartum and postpartum care. Limited interest or ownership to host an RSC and hesitation among providers at the facilities resulted in this component being largely underutilized. RSCs were established at medical colleges to provide on-demand support to providers at peripheral health facilities. As medical colleges were under purview of Department of Medical Education and PHC, CHC, SDH and DHs were under Department of Health, there was a **need for greater convergence and collaboration** for the uptake of RSC.

With staff shortage and frequent provider transition, several facilities found it challenging to keep up with the changes, imploring the need for system strengthening. For the sustained adoption of best clinical practices and ASMAN technology, it became imperative to create a pool of trainers at the district and state levels. **Building State capacities**, therefore, emerged as an important prerequisite for program sustenance and scalability.

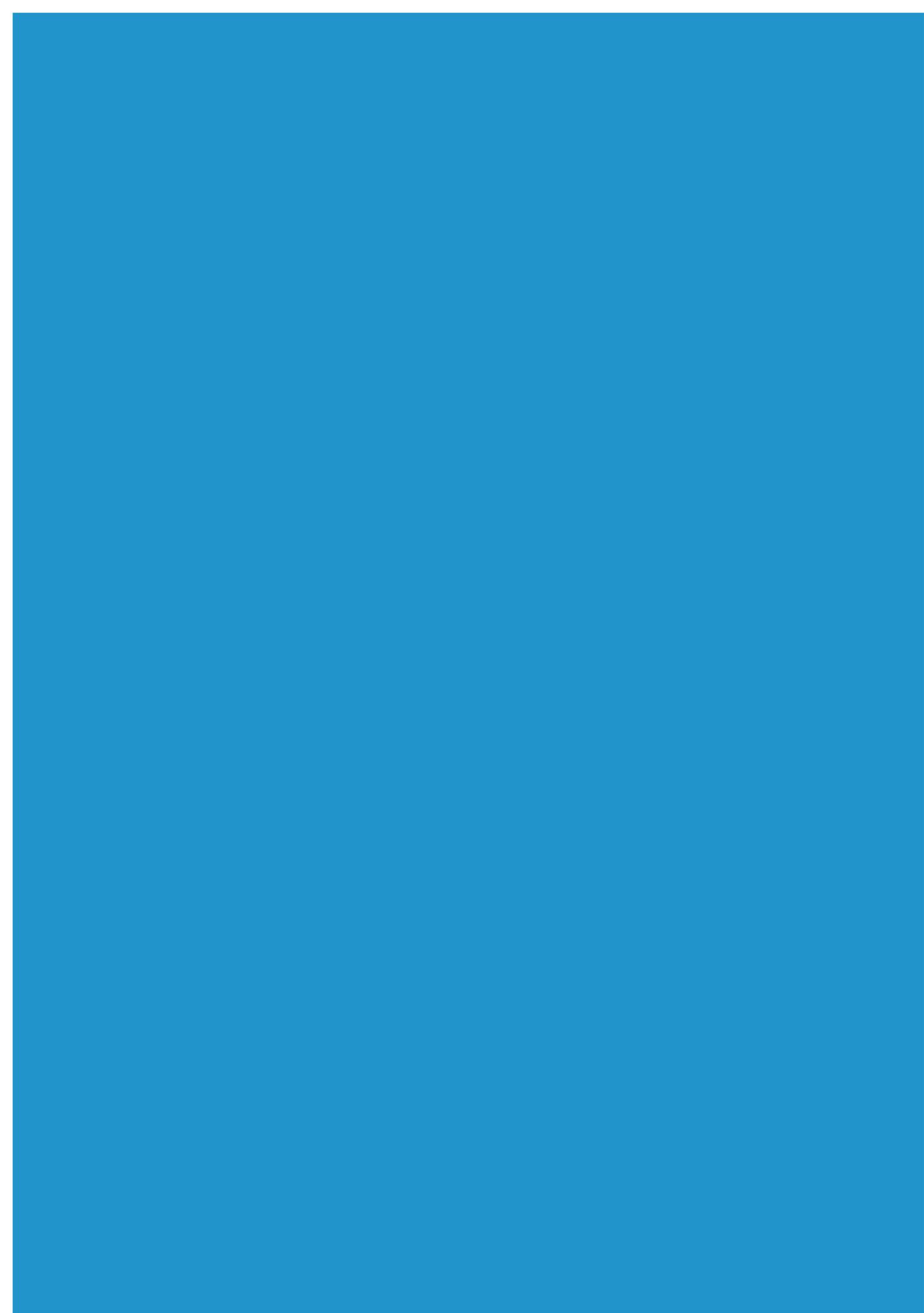
Program Effectiveness

The technological component of ASMAN proved to be a key enabler in monitoring of labor progress and providing decision-making support to providers. It was initially found that the facilities being understaffed affected the quality of data entry in the app. In addition, factors such as unfamiliarity with technology and age added to the reluctance amongst some providers.

“Some of the factors that emerged during initial brainstorming sessions indicated the need to keep considerations of low dependency on bandwidth, labor room environment, etc. in mind, all of which contributed to the design process. The introduction of digital registers significantly reduced the time of providers invested on paper-work which is now utilized in providing quality care to mothers and newborns”.

Mr Sumeet Mahajan, Avalon Information Systems

An effective mechanism adopted by ASMAN for increasing the uptake of technology was advocacy around its perceived benefits, coupled with **sustained training and handholding**, which substantially increased provider confidence and motivation. Advocacy with the government and regular review of program will help to address the identified gaps.



8. RECOMMENDATIONS

The following recommendations, given for different phases of program implementation, have been put forth after a careful analysis of the program evaluation and impact, and intensive stakeholder discussions. They are intended to provide crucial answers in the pursuit of implementing similar m-health programs, enrich the outcomes of such multi-stakeholder projects, and strengthen the sustainability of such initiatives in the future.

PROGRAM IMPLEMENTATION	TRANSITION AND HANDOVER
<p>Ascertain shared understanding of digital solution amongst healthcare providers</p> <p>Ensure technological readiness and inter-departmental coordination for better uptake of m-health interventions</p> <p>Address systemic barriers such as internet connectivity, application bugs etc. for the uptake of digital solution</p> <p>Account for government delays in granting approvals and procurement of logistics</p> <p>Regular trainings and continued mentoring support to providers for increased uptake of digital solution</p> <p>Adopt a human-centric approach to the intervention and implementation for increased motivation among providers for uptake of technology</p>	<p>Account for delays due to adoption of a new digital solution by the government</p> <p>Building state capacities sufficiently to take over and manage digital solution on their own</p> <p>Obtain consensus from the government on transition and handover with clear timelines to avoid mismatch of expectations</p> <p>Place mechanisms for introspection midway into the program for preparing a suitable and sustainable exit strategy</p> <p>Define the geographical and temporal scope of scale-up internally before handover</p>
GOVERNMENT ENGAGEMENT	SUSTAINABILITY
<p>Ensure flexibility and adaptability to evolving government needs during program implementation</p> <p>Capacity building of govt. health managers/program managers for data-driven decision making using digital solution for their increased engagement in program monitoring</p> <p>Account for the time it could take to secure govt. approvals</p> <p>Greater inter-departmental coordination to ensure better uptake of digital solutions</p>	<p>Build on existing public sector initiatives for greater buy-in of the government</p> <p>Leverage learnings to customize tech packages as per local needs to ensure sustainability</p> <p>Ensure the buy-in and ownership of the facility-in-charge and medical supervisors for sustained adoption of the technology solution</p> <p>Integrate the program with larger government initiatives to ensure commitment and scale-up</p>



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