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Challenges in Early Intervention for Maternal Health: Lessons from Madhya Pradesh

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Abstract

India has made progress in digital health, including in telemedicine and creating platforms such as Co-WIN for the COVID-19 vaccination rollout. These initiatives demonstrate the benefits of technology in enhancing the availability and affordability of, and access to healthcare services. This report examines the challenges that continue to stall the reduction of maternal deaths in India. It uses the case of Madhya Pradesh, the state with the highest maternal mortality rate in India, to highlight the role of sub-national interventions in implementing real-time monitoring systems for maternal healthcare. It evaluates the potential of digital solutions in helping frontline workers arrest the incidence of maternal mortality, particularly in the area of timely initiation of antenatal care.

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Introduction

According to a government bulletin on maternal mortality for 2018-2020, the national maternal mortality ratio (MMR)[a] is 97 per 100,000 live births. The ratio for Madhya Pradesh, the state with the second highest after Assam, is at 173.[1] This report studies the experience of 15 districts in Madhya Pradesh in utilising digital health tools to improve outcomes in maternal health.

In 2013, the Government of India established the National Health Mission (NHM), subsuming the National Rural Health Mission (NRHM), to hasten progress in improving healthcare in the country's rural districts. Since then, frontline rural health workers have played an important role in the provision of healthcare, including maternal and child health. Several studies have demonstrated that frontline health workers such as Accredited Social Health Activists (ASHA), Auxiliary Nurse Midwives (ANM), and Anganwadi Workers (AWW) are key to better outcomes in maternal and child health. They are vital, for example, in promoting reproductive health and family planning services. To be sure, however, other analysts have raised concerns about their performance and accountability.[2,3] These analysts say, for instance, that ANMs and ASHAs may not be capable of recognising the link between nulliparity (when a woman has not had a live birth), and complications during past pregnancies—and how it relates to early registration in the present pregnancy.

a Maternal Mortality Ratio: The proportion of maternal deaths per 100,000 live births. Maternal Mortality Rate: Calculated as maternal deaths of women ages 15-49 per 100,000 women in that age group.

The prevention of maternal and infant and child deaths is an urgent imperative, given the health complications that may occur during pregnancy but which could be prevented if addressed in a timely manner. For instance, the first and most important step in identifying High Risk Pregnancies (HRPs) is the early registration of pregnant women in the public health system. In this regard, the Madhya Pradesh government in 2019 rolled out a digital Reproductive and Child Health (RCH) platform, Auxiliary Nurse Midwife On-Line (ANMOL), to fast-track the on-boarding of identified pregnant women. As soon as a pregnancy is tested, the woman is registered in the ANMOL app. The platform is then used to track the pregnant woman and provide her with the required four antenatal check-ups (ANC)—the first of which ideally takes place in the first trimester—to ensure the safe delivery of the child and identify potential complications.[4,5,6]

The road to success is long, however, and the state's maternal mortality ratio continues to remain high, according to reports such as the National Family Health Survey (NFHS) and the Sample Registration System (SRS), and stands at 173.[7,8] To identify key areas for focused intervention in the next decade, the Government of Madhya Pradesh set up a high-level task force in January 2022 to prepare strategies to reduce infant, neonatal, and maternal mortality in the state.[b]

This report investigates the challenges facing frontline health workers in 15 districts in Madhya Pradesh. These impediments are primarily related to the early registration of pregnant women. The analysis utilises a mixed research design: the authors collected data and testimonials from health workers from 32 health facilities across the 15 districts. They conducted interviews with key informants, including government officials, frontline health workers, NGOs, and program implementers, analysed mortality levels and trends, the coverage of maternal and child health interventions, and equity—the latter, using data from sources such as Sample Registration System and National Family Health Survey. Data on health services and systems were also analysed using the state's Reproductive and Child Health portal.

b The task force has gathered experts from academia as well as other performing states and conducted a thorough analysis of related literature in the domain to identify crucial implementation modalities and key areas for intervention. It has also carried out assessments of various stakeholders in the MP health system and the department of women and child development.

Initial interventions from the state health department focus on schemes for maternity assistance. The *Mukhyamantri Prashruti Sahayta Yojana* (MPSY), which provides financial assistance to pregnant women of labourer families belonging to Below Poverty Line (BPL) households, was modified in July 2022 to encourage more pregnant women to register and undergo an ANC check-up in the first trimester.[c] In case of non-registration in the first trimester due to any reason, beneficiaries now have the option to register after one month on the recommendation of the Block Medical Officer (BMO). Additionally, Ayushman empanelled facility benefits will also be available for high-risk pregnancy cases in private hospitals. Other changes include an amount of INR 1,400 for beneficiaries from rural areas from *Janani Suraksha Yojana* (JSY) and INR 10,600 from MPSY. For urban districts, the benefits are INR 1,000 from JSY and INR 11,000 from PSY.[9] In the event of the newborn's death within a few hours after birth, or if early breastfeeding and vaccination are not possible, the beneficiary will still be eligible for post-delivery financial assistance.

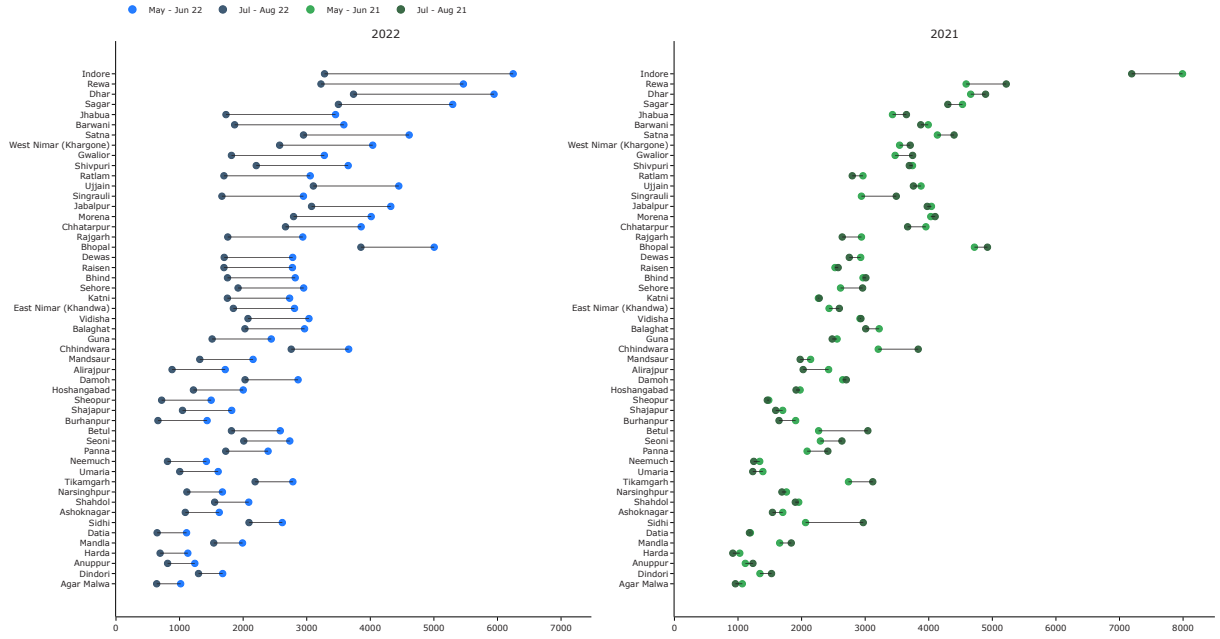
Methodology

To assess the effectiveness of the updated MPSY policy, these authors examined pregnancies registered two months before (May-June) and after (July-August) the policy went into effect. The results from the RCH portal were compared with data from the same period in 2021 to rule out any seasonal variations in birth patterns. In 2022, there was a decrease in pregnancies in all districts from May-June to July-August, which was not observed in 2021. (see Fig. 1).

The task force thus decided to conduct field visits to various facilities across multiple districts in Madhya Pradesh to understand the challenges faced by frontline workers. The aim was to explain the reasons for the decline in the registration of pregnant women and subsequent delays in antenatal check-ups, as well as the identification of high-risk pregnant women.

c A beneficiary will receive INR 4,000 when she undergoes an ANC check-up in the first trimester of pregnancy. Prior to this policy, the women were being paid in instalments of INR 1,000 per ANC for four visits.

Fig. 1:
Registrations of Pregnant Women in Decline (2021-2022)

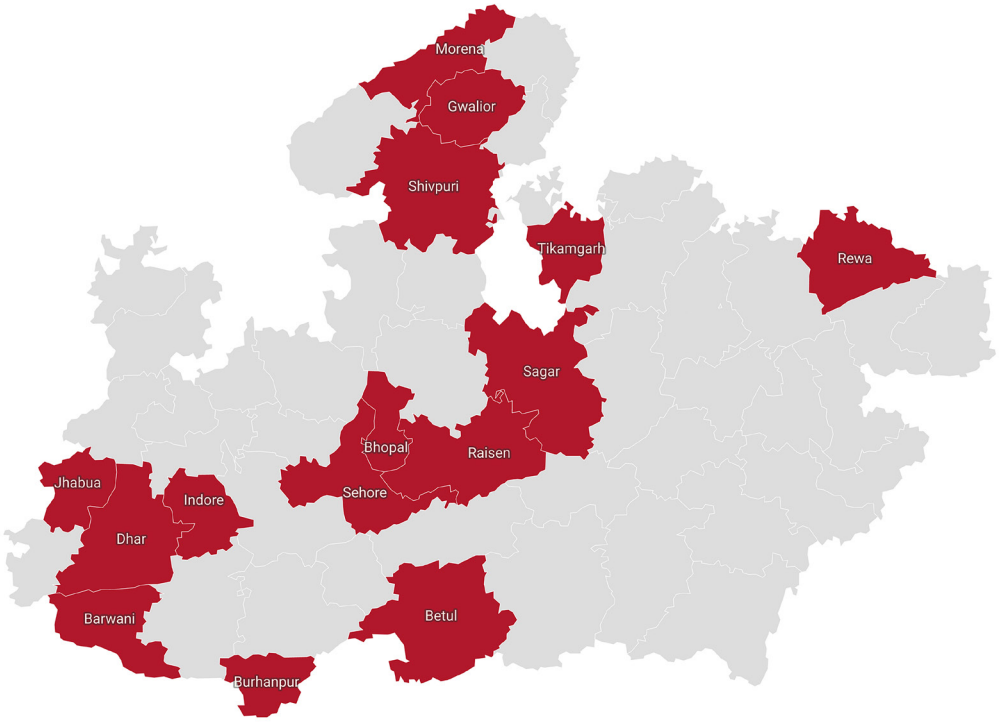


Source: ANMOL RCH Portal (accessed on 14 October 2022)

Information was gathered from 28 Sub-Health Centers (SHC), four Primary Health Centers (PHC), and one Community Health Center (CHC) across 15 districts of Madhya Pradesh. The primary data was collected from ASHA and ANM hard copy registers and compared to data from the RCH portal, ANMOL. The districts were selected randomly. The facilities in the selected districts were chosen based on their proximity to the district hospital. The field visits also included key informant interviews with stakeholders such as government officials, frontline health workers, NGOs, and program implementers. Members of the task force visited facilities in some districts. In other districts, it was carried out by fellows from the Chief Minister's Young Professionals for Development Programme (CMYPDP).[d] (See Annex for details about the field visits.)

d The Chief Minister's Young Professionals for Development Programme (CMYPDP) is a flagship program of the Government of Madhya Pradesh designed to introduce a diverse and inclusive group of qualified young professionals to the state's development processes through district, block, and village-level immersion. The program is anchored by the Atal Bihari Vajpayee Institute of Good Governance and Policy Analysis, Bhopal.

Fig. 2:
Districts (15) Covered by the Task Force



Source: Authors' own

Results and Analysis

1. Challenges in Tracking Pregnancies and Identifying High-Risk Cases

Since the inception of NRHM in 2005, the role of frontline community health workers has proven crucial in the promotion of rural healthcare. ASHA and ANM cadres were built to strengthen decentralised health planning and management at the village and district levels. Every village with a population of 1,000 is assigned an ASHA worker to empower women in the community to make healthcare decisions and understand health determinants, particularly those related to maternal and child health.[10] According to NRHM, they must meet on a regular basis, and ASHAs are expected to assist ANMs and keep them informed of their activities. ASHAs are one of the first points of contact chosen from the village to raise awareness, plan community health, and provide maternal and child health services. ASHAs also maintain vital variables related to pregnant women's health and voluminous registers of vital health information about the village population. These pieces of information are critical in tracking High-Risk Pregnant Women (HRPW) and child health, though the authors of this report observed that the ASHA data is not being used effectively.

Typically, information regarding the tracking and registration of pregnant women flows through ASHAs who conduct door-to-door visits in the village, i.e., *grah bhent*,[e] making them the first point of contact for the women. At times, pregnant women may come directly to ANMs for check-ups. The ANMs have the authority to order prenatal check-ups for pregnant women, whereas ASHAs can only inform the ANMs about these pregnant women. Both ASHAs and ANMs maintain registers to keep track of pregnant women registrations, and while ANMs upload the register information to the RCH portal, ANMOL, the information in the ASHA's registers is underutilised.

The cadre of Community Health Officers (CHO) also maintain this information in the master register at the facility level and update information on third and fourth ANCs directly to the RCH portal. Since ASHAs are typically the first point of contact at the community level, regular coordination between the ASHAs and the ANMs is crucial for maintaining accurate records of pregnant women in their catchment area.

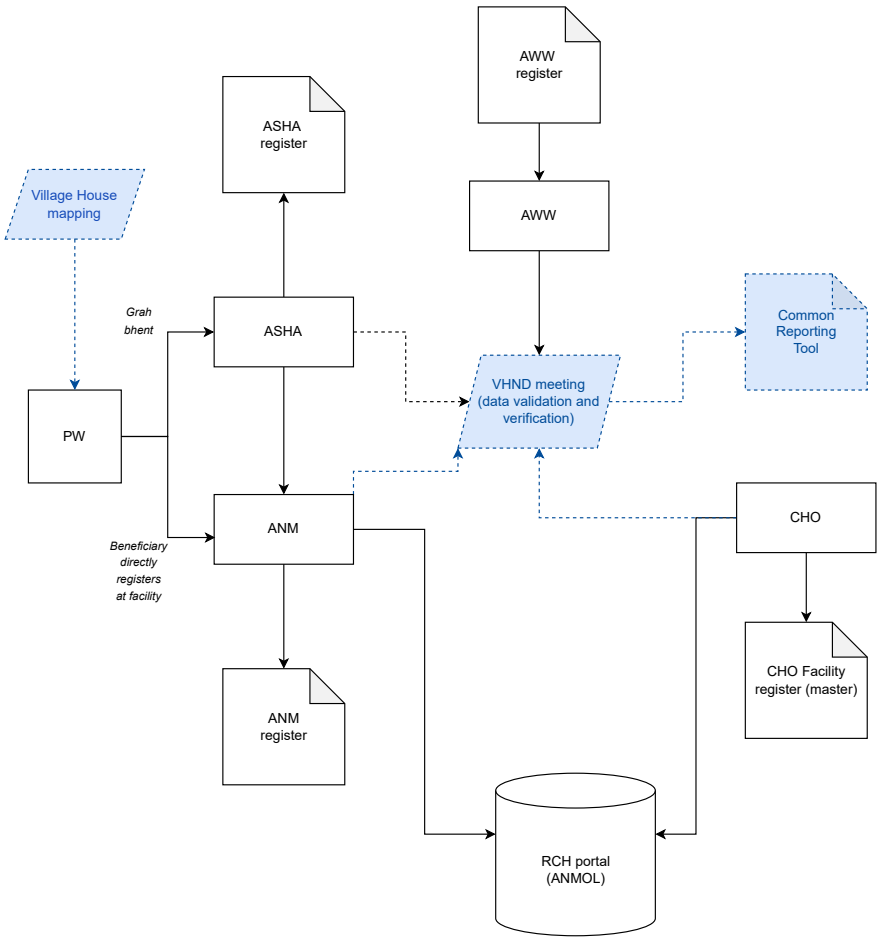
Field visits to the Anganwadi Centre (AWC), Gyaraspur, SHC Gajpur, AWC Kalyanpur, and SHC Dhol in the Betul district highlighted a few best practices for improving the data quality of registers, which will eventually be reflected in the RCH portal. These included standardised practices for identifying and tracking beneficiaries by mapping out households in a prescribed linear sequence. This was followed by the rationalisation of ASHA registers by removing redundant information. Another key exercise was a formal meeting on Village Health and Nutrition Day (VHND)[f] among frontline health workers (ASHAs, ANMs, AWWs, and CHOs) to review each other's work and data, plan for the next month, and conclude with a peer-learning session where they would educate each other on technical and administrative matters. The Akshita[11] program of the Antara Foundation has been pivotal in inculcating these practices with frontline health workers, specifically in the districts of Betul and Chhindwara.

e Grah bhent refers to the periodical home visits conducted by the ASHAs at their respective villages for the identification of newly married couples and pregnant women.

f VHNDs are an intersectoral convergence meeting conducted every month at the village level. Typical activities during the VHND include pregnant women registrations, antenatal check-ups, and immunisation. It is also utilised as a platform for interfacing between the community and the health system.

All these practices contribute to minimising error, improving data quality, fast-tracking the identification and registration of pregnant women, facilitating antenatal check-ups, and identifying high-risk cases. Figure 3 depicts the flow of information from the time the pregnant woman is identified, to when data is updated in the ANMOL app. The highlighted sections indicate the practices brought on by the introduction of the Akshita program.

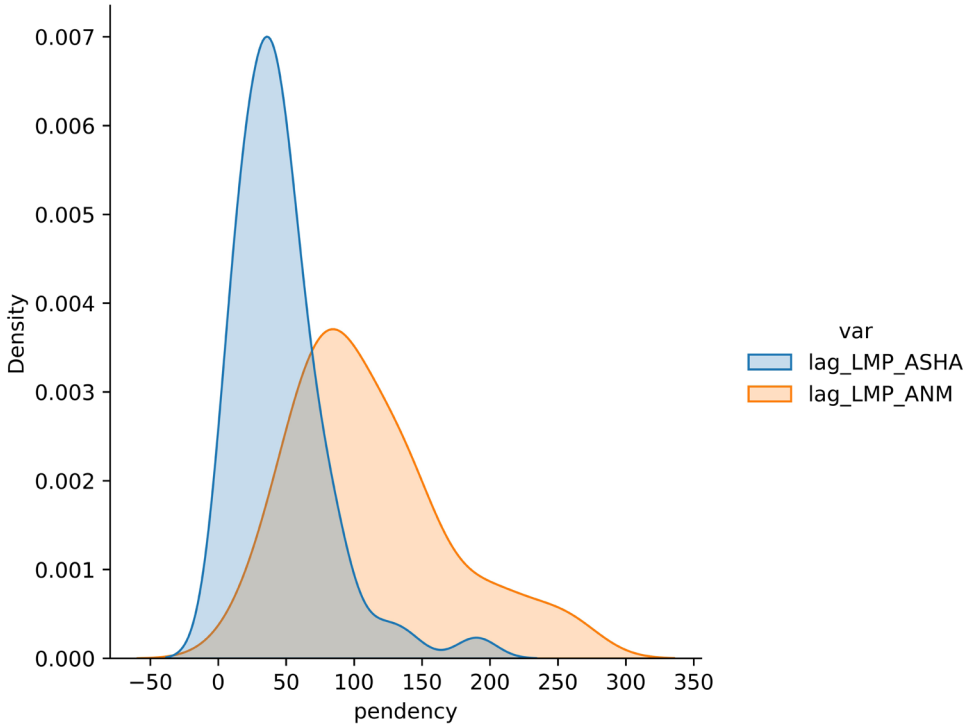
Fig. 3:
Information Flow in the Identification and Tracking of Pregnant Women



Source: Authors' own

The data collected from the field visits were analysed by comparing the delays in the flow of pregnancy information from the beneficiary's last menstrual period (LMP) to ASHA, and subsequently, from the beneficiary's LMP to ANM. Figure 4 depicts the time lag between when the ASHA and ANM receive the LMP information. The average time for an ASHA to track a pregnant woman from her LMP is 46 days, and 112 days for the ANM. As a result, registrations, antenatal check-ups, and early identification of high-risk pregnancies are delayed. The NRHM guideline for mandatory first ANC at 12 weeks of pregnancy is also largely ignored, emphasising the importance of coordination among health workers at different levels of the public healthcare system.

Fig. 4:
Lag in the Time LMP Information is Made Available to ASHA and ANM



Data Source: Samples of pregnant women collected from SHC Pagneshwar, Raisen; SHC Maakhni, Raisen; CHC Bilkisganj, Sehore; SHC Sohagpur, Betul

2. Impact of Technology on Early Interventions and Associated Challenges

The early detection of a high-risk pregnancy is crucial for ensuring safe delivery. The RCH portal was created with the goal of tracking pregnant women in real-time through digitisation of data, with the aid of healthcare workers. The authors of the present report examined the relationship between the coverage of the digital RCH portal and early initiation of ANC. Data was collected on RCH coverage (i.e., percentage of pregnant women registered in the portal) from the state RCH portal ANMOL, and an OLS model was used to analyse the relationship with early initiation of ANC.[g]

The results showed that RCH coverage (β = 0.601, $p<0.05$) had a positive and significant association with early initiation of ANC (see Table 1). Furthermore, the authors controlled for the literacy rate of the pregnant women, which were obtained from NFHS-5. Even after controlling for literacy rates, RCH coverage remained significantly associated (β = 0.609, $p<0.05$) with early initiation of ANC. This suggests that the coverage of the RCH portal is an important factor in encouraging pregnant women to initiate ANC early, regardless of their literacy levels. Overall, the findings highlight the importance of improving the coverage of the RCH portal ANMOL in promoting maternal and child health.

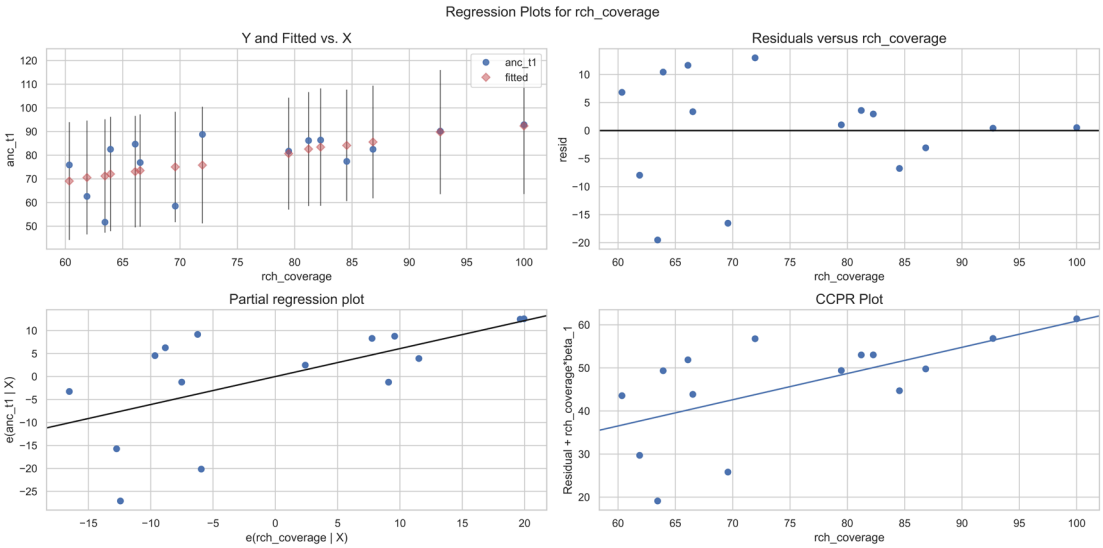
Table 1:
Net Effect of RCH Coverage and Literacy Rate of Pregnant Women on Early ANC, Based on the OLS Regression Model

	Model 1	Model 2
Variables		
RCH coverage (% pregnant women registered in RCH portal)	0.601 (0.015)*	0.609 (0.02)*
Literacy rate (% women)		0.043 (0.8)*
R-squared	0.38	0.42

*$p<0.05$

g This is for the selected 15 districts. The mean percentage is 70.3 and the standard deviation is 22.9.

Fig 5:
Positive and Significant Association with Early ANCs



However, the high maternal mortality rate in the state highlights deficiencies in the system. Issues with work allocation and the mechanism for reviewing data digitisation can negatively influence the success of these initiatives. For instance, the weekly review of PW registration status by NHM is based on ANMOL data using pro-rata estimates of pregnancies generated using linear projections of the district-wise population from the 2011 Census and birth rates from AHS 2012-13. Seasonality is not taken into consideration, and recent birth rates are also not computed.

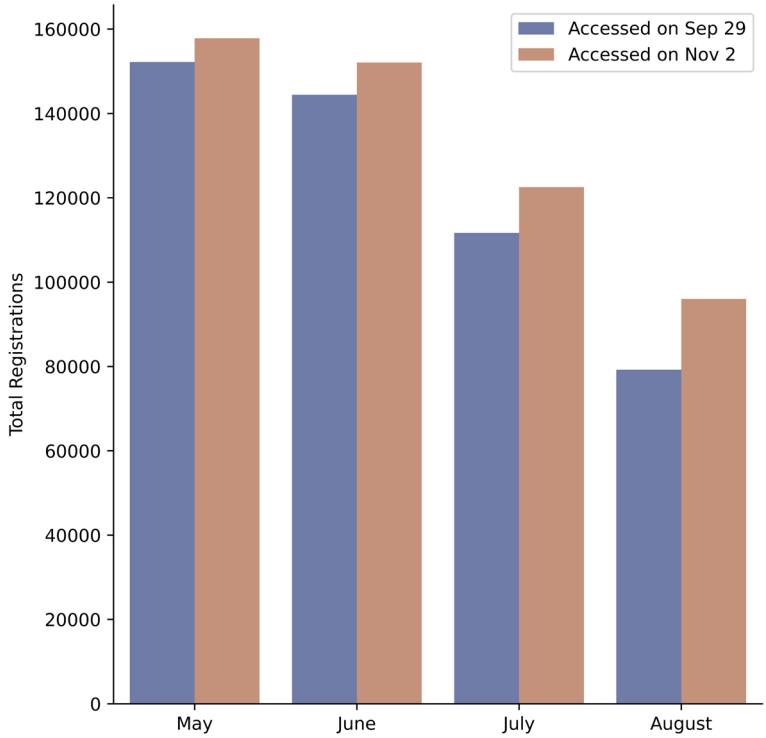
For instance, in the review from the first week of April 2022 (1-7 April 2022), conducted on 8 April, there were 7,138 registered pregnancies. Extracting data for the same period from the RCH portal on 2 November 2022 shows the number of pregnancies to be 88,191.

Such inconsistencies arise because there is no set deadline for ANMs to upload data to the portal. Fig. 6 depicts the registration of pregnant women from May to August 2022, as recorded in the RCH portal on 29 September 2022 and 2 November 2022. The percentage differences ranged from 3.5 percent for May and 19.2 percent for August.

This demonstrates that the data maintained by the portal is not real-time or even close to real-time. In addition, the continuous promotion of multiple government schemes and programs such as *Indradhanush* and *Dastak Abhiyan* is posing a massive challenge to data digitisation. These programs require a considerable amount of time and effort from the frontline health workers, who are responsible for collecting and recording patients' data. As a result, they may not be able to dedicate sufficient time to digitise such data, which is critical for improving healthcare delivery and decision-making.

Furthermore, the promotion of these programs results in an influx of patients seeking healthcare services, which further adds to the workload of frontline workers. As a result, they may not be able to prioritise data digitisation tasks, leading to delays in the process and a backlog of unrecorded data.

Fig. 6:
Delays in Data Updates in RCH Portal ANMOL (May – August 2022)



To be sure, however, this problem is not unique to these 15 districts in Madhya Pradesh.[12] Due to their high workload, ANMs and ASHAs find it difficult to share information in a timely manner and follow up on the services provided to pregnant women and newborns. In such a scenario, digital solutions can play a significant role in reducing the information lag between ANMs and ASHAs.

One way to enhance the data reporting system is to allow ASHAs to digitise data directly in the RCH portal. Gujarat has already implemented this approach with the introduction of the TeCHO+ mobile app, which enables ASHAs to update information on pregnant women directly in the system. Although most ASHAs in Gujarat are likely new to the use of smartphones, they were enthusiastic about adopting the new technology. To address any difficulties in using the app, the program had a strong troubleshooting mechanism, including a WhatsApp group, helpline numbers, and voice calls; supportive supervision was maintained as well.[13] The TeCHO+ app also features alert generation for high-risk cases, mandatory work plan logging with SMS alerts for health workers, GPS tracking for accountability, and cross-checking calls to verify service delivery. The successful monitoring through TeCHO+ provides a positive example for other states to adopt and incorporate best practices.[14]

The collected data from the 15 districts in MP reveals discrepancies between the information recorded in the hard-copy registers of ANMs and the RCH portal, ANMOL (as shown in Table 2). Only 9.5 percent of the 84 cases show consistency between the ANM registers and RCH data store. In 40.5 percent of cases, the figures in the ANMOL portal are lower than those in the registers. In seven cases, the data was not present in the RCH portal. Additionally, 38 percent of cases showed that the registers had fewer entries than the portal. This occurs when data is uploaded directly at the facility by DEOs, which only appear in their handheld devices and not in the ANM registers. ANMs also sometimes upload the data directly to the RCH ANMOL app instead of recording it in the hard-copy registers. Incorrect mapping of the facility in the RCH application also resulted in inaccurate data capture in some instances.

Table 2:
Discrepancies in Information on Pregnant Women in ANM Registers and RCH Portal (July – September 2022)

District	Block	Facility Name	Facility Type (SHC/ PHC/ CHC)	Number of PW Registred (July 2022)	Number of PW Registred (July 2022) ANMOL	Number of PW Registred (Aug 2022)	Number of PW Registred (Aug 2022) ANMOL	Number of PW Registred (Sep 2022)	Number of PW Registred (Sep 2022) ANMOL
Barwani	Silawad	Talun	SHC	2	6	2	4	2	4
Barwani	Silawad	Lonsara	SHC	8	8	2	3	6	4
Barwani	Silawad	Balkua	SHC	6	4	6	4	7	4
Burhanpur	Burhanpur	Mohammadpura	SHC	5	3	9	3	4	5
Burhanpur	Burhanpur	Bhadarpur	SHC	12	18	21	6	20	4
Burhanpur	Burhanpur	Hamidpura	SHC	12	4	18	5	20	1
Dhar	Teesgaon	Teesgaon	PHC	4	4	1	1	3	1
Dhar	Dhar	Kesur	PHC	6	10	12	11	6	12
Gwalior	Morar	Berja	SHC	9	22	2	11	4	4
Indore	Sawer	Manglia	PHC	10	Data not available	21	Data not available	17	Data not available
Jhabua	Rama	Rotla SHC	SHC	5	2	5	2	6	2
Jhabua	Rama	Vaglawat	SHC	5	8	4	2	5	2
Jhabua	Jhabua	Pitol	PHC	10	23	3	63	23	63
Morena	Morena	Noorabad	SHC	24	12	16	8	18	3
Morena	Joura	Mudrawaja	SHC	8	11	12	16	16	8
Morena	Morena	Banmor	SHC	19	Data not available	19	Data not available	17	Data not available
Rewa	Rewa Gramin (Govindgarh)	Baijnath	SHC	8	4	9	9	3	12
Rewa	Rewa Gramin (Govindgarh)	Silpra	SHC	9	10	3	2	8	8
Rewa	Rewa Gramin (Govindgarh)	Madwa	SHC	7	15	8	6	11	12
Sagar	Banda	Dilakhedi	SHC	16	21	11	9	18	14
Sagar	Banda	Kanwa	SHC	15	No Data available	14	8	11	1
Sagar	Makroniya Bujurg	Gambhiriya	SHC	26	Inconsistent mapping in ANMOL	22	Inconsistent mapping in ANMOL	24	Inconsistent mapping in ANMOL
Shivpuri	Shivpuri	Nohari	SHC	11	20	2	17	13	17
Shivpuri	Shivpuri	Raishree	SHC	15	16	9	16	19	15
Shivpuri	Shivpuri	Badagaon	SHC	14	11	11	11	11	16
Tikamgarh	Tikamgarh	Pahadi Tilwaran	SHC	16	13	4	8	15	9
Tikamgarh	Tikamgarh	Kundeshwar	SHC	13	16	9	5	10	11
Tikamgarh	Tikamgarh	Khiriya	SHC	16	16	12	18	9	11

No difference
ANMOL has fewer entries
Register has fewer entries

Data Sources: Data captured from ANM registers from 28 facilities across 11 districts of MP and ANMOL RCH Portal, accessed on 11/11/2022

3. Testimonies from Stakeholders

Other challenges were reiterated in testimonies made by frontline health workers to these authors. During the field visits, it was observed that certain information gathered in SHC-level antenatal check-ups was inaccurate. Tests such as hemoglobin levels, for example, were found to be imprecise compared to those done in private or in CHC laboratories. Further investigation at the CHCs revealed that 116 pregnant women presented with low hemoglobin levels during labour despite having normal levels recorded on their MCH card filled out by the ANM during ANC check-ups. This lack of thoroughness could be due to either malfunctioning equipment or lack of skills in the frontline workers.

According to the narrations made by ASHAs who spoke with these authors, obstacles to their effective functioning include social, cultural, and institutional impediments. For example, an ASHA from the Raisen district said that cultural norms in the community prevent women from disclosing their pregnancy during the early weeks, leading to a delay of around four months before they seek their first antenatal check-up. Earlier studies have also found that certain socio-cultural norms play a significant role in hindering ASHAs from performing their duties effectively.[15] ASHAs have reported facing challenges in their work due to gender, cultural, and religious norms that restrict their clients' autonomy in making decisions about their own health. These same norms have also made it difficult for ASHAs to carry out their tasks, such as connecting women with antenatal care and institutional delivery, as well as registering early pregnancies. Among these impediments is the societal preference for male offspring, which makes couples hesitant to disclose second pregnancies if they already have a daughter. Traditional beliefs in home deliveries, as well as religious or social proscriptions around immunisation, birth spacing, and contraception, have further complicated ASHAs' health promotion activities.

In another interview with an ASHA from the Bhopal district, these authors noted that frontliners are often demotivated by the unprofessional attitudes of their superiors. This, in turn, results in a lack of trust from the pregnant woman's family, who are wary of sending their daughter or wife to the hospital with an ASHA.

These challenges need to be addressed as a priority, as ASHAs are often the first points of contact during pregnancy.

ASHAs are the most critical cadre in promoting maternal and child health at the community level. Therefore, these issues require attention from the state government as organisational support is critical for the success of actions being taken by the community health workers. Previous studies also highlight the bidirectional influences of the family, community, and other personal factors on ASHAs' self-efficacy that determine the actions and strategies they take.

Recommendations

- Improving the training and capacity-building of frontline health workers: This can be done by providing targeted modular trainings to the ASHA and ANM workers on proper data collection techniques and the effective utilisation of digital tools and software. ASHAs also need to be engaged in data digitisation, reducing the burden of the ANMs.

- Streamlining data entry processes: The data entry process should be made less complex and more efficient to reduce the time and effort required to digitise data. Efforts should include using standardised forms, reducing the number of fields in the forms, using drop-down menus in handheld applications, and auto-filling information using state (Samagra) or national ID to reduce errors. Integrating the aggregate data from the RCH portal and the monthly reports in the HMIS would reduce the workload for frontliners as they would no longer need to digitise the same information for multiple data systems.

- Direct beneficiary registration: Enabling eligible beneficiaries to register directly with the RCH portal ANMOL could lead to increased engagement and participation. It could also help streamline the administration of RCH services and alleviate the workload of healthcare workers involved in data digitisation.

- Encouraging data sharing and collaboration: The sharing of data between different stakeholders (e.g., ASHAs and AWWs) can improve data collection and analysis, which can support better decision-making and program implementation. Effective utilisation of VHNDs and VHSNCs as peer-learning sessions between the different frontline health workers can also contribute to improving data quality.

- Regular monitoring and evaluation: Regular monitoring and evaluation can help identify and address any gaps or limitations in the data collection process and ensure quality of data at all levels..

- Encouraging community participation: Community participation in data collection can improve the accuracy and completeness of the data, while also creating awareness about maternal and child health issues among the community.

- Incentives: Frontline health workers should be incentivised to use digital technologies and maintain high-quality data. This could take the form of financial incentives, as well as recognitions and rewards.

- Technical support: Frontline health workers should have access to technical support when needed. This could include help-desk support and in-person trainings.

- Feedback and continuous improvement: Regular feedback and continuous improvement processes should be put in place to identify areas for improvement and pave the way for course-corrections as needed. This will help improve data digitisation practices over time.

- The state should adopt corrective measures taken up by various stakeholders such as NGOs and private sector organisations for improving data quality and accuracy in similar settings.

Conclusion

India is aiming for a rapid digital transformation of its healthcare systems, laying the groundwork by building internet infrastructures that provide a consistent baseline for connectivity and data fidelity. However, such 'digital transformation' is yet to be integrated in crucial sectors such as healthcare.

This report examined the role of digitisation in improving early intervention in pregnancies to reduce the incidence of maternal mortality. A number of critical issues remain on the ground that must be addressed to make digitisation work for better health outcomes.

Health workers are frequently overworked and may be unable or unwilling to invest the necessary time and effort to effectively utilise digital tools, such as the ANMOL app in the Madhya Pradesh health system. Time lags between a health episode and its digitisation have also resulted from capacity constraints. The synchronisation of frontline workers, as well as the standardisation of data collection practises, are the first steps towards building a near real-time data repository that can be used to tailor interventions for at-risk pregnant women. Policymakers must address the various challenges associated with inconsistent data-recording practices and their subsequent impacts on maternal health service delivery.

Annexes

The field visits were conducted in three phases. The first phase focused on the following 16 facilities from the districts of Indore, Rewa, Dhar, Jhabua, Sagar, Bhopal, and Barwani:

PHC Manglia, Indore

SHC Silpra, Rewa

SHC Baijnath, Rewa

SHC Madwa, Rewa

PHC Teesgaon, Dhar

PHC Kesur, Dhar

SHC Rotla, Jhabua

SHC Vaglawat, Jhabua

PHC Pitol, Jhabua

SHC Dilakhedi, Sagar

SHC Kanwa, Sagar

SHC Gambhiriya, Sagar

SHC Talun, Barwani

SHC Lonsara, Barwani

SHC Balkua, Barwani

SHC Ratibad, Bhopal

In the second phase, field visits were conducted at the following facilities from the districts of Morena, Bruhanpur, Gwalior, Shivpuri, and Tikamgarh:

SHC Noorabad, Morena

SHC Mudrawaja, Morena

SHC Banmor, Morena

SHC Mohammadpura, Burhanpur

SHC Bhadarpur, Burhanpur

SHC Hamidpura, Burhanpur

SHC Berja, Gwalior

SHC Nohari, Shivpuri

SHC Raishree, Shivpuri

SHC Badagaon, Shivpuri

SHC Pahadi Tilwaran, Tikamgarh

SHC Kundeshwar, Tikamgarh

SHC Khiriya, Tikamgarh

In the final phase, the task force members visited the following facilities:

SHC Pagneshwar, Raisen

SHC Maakhni, Raisen

CHC Bilkisganj, Sehore

SHC Sohagpur, Betul

During the final phase, the authors collected primary data on 64 pregnant women registered at the facilities to assess the time lag in information flow from the LMP to the RCH portal, ANMOL.

Endnotes

1. Maternal Mortality Bulletin 2018-20
2. Prakash B. Patel et al., "Antenatal Care Registration and Predicting Factors of Late Registration Among Pregnant Women." *Tropical Doctor* 43, no. 1 (2013): 9-12.
3. Pankaj Salvi et al., "Timing of Registration for Antenatal Care Among Pregnant Women Delivering in a Tertiary Care Hospital in an Urban Area." *Journal of Evolution of Medical and Dental Sciences* 3, no. 18 (2014): 4925-4934.
4. Pavan Sable and Mridula Sable, "Association of Early Registration of Pregnancy with ANC Visits." *Global Journal for Research Analysis* (2017).
5. Patel et al., "Antenatal Care Registration and Predicting Factors of Late Registration Among Pregnant Women"
6. Salvi et al., "Timing of Registration for Antenatal Care Among Pregnant Women Delivering in a Tertiary Care Hospital in an Urban Area"
7. Maternal Mortality Bulletin
8. Sable and Sable, "Association of Early Registration of Pregnancy with ANC Visits"
9. Mukhya Mantri Seva - (Prasuti Sahayta) Yojna Mein Sansodhan - Letter No. 1001/982/2022/17/M-2,
10. NHM 2005
11. Akshita Program, the Antara Foundation, Madhya Pradesh, 2019-present, https://antarafoundation.org/madhya-pradesh-state
12. R. Gera et al., "An In-Depth Assessment of India's Mother and Child Tracking System (MCTS) in Rajasthan and Uttar Pradesh." *BMC Health Services Research* 15, no. 1 (2015): 1-14.
13. S. Saha et al., "Addressing Comprehensive Primary Healthcare in Gujarat Through mHealth Intervention: Early Implementation Experience with TeCHO+ Programme." Journal of Family Medicine and Primary Care 9, no. 1 (2020): 340–346. https://doi.org/10.4103/jfmpc.jfmpc_835_19.
14. S. Saha et al., "Addressing Comprehensive Primary Healthcare in Gujarat Through mHealth Intervention: Early Implementation Experience with TeCHO+ Programme." *Journal of Family Medicine and Primary Care* 9, no. 1 (2020): 340–346. https://doi.org/10.4103/jfmpc.jfmpc_835_19.
15. E. Sarin and S. S. Lunsford, "How Female Community Health Workers Navigate Work Challenges and Why There are Still Gaps in Their Performance: A Look at Female Community Health Workers in Maternal and Child Health in Two Indian Districts Through a Reciprocal Determinism Framework," *Human Resources for Health* 15, no. 1 (2017): 1-10.

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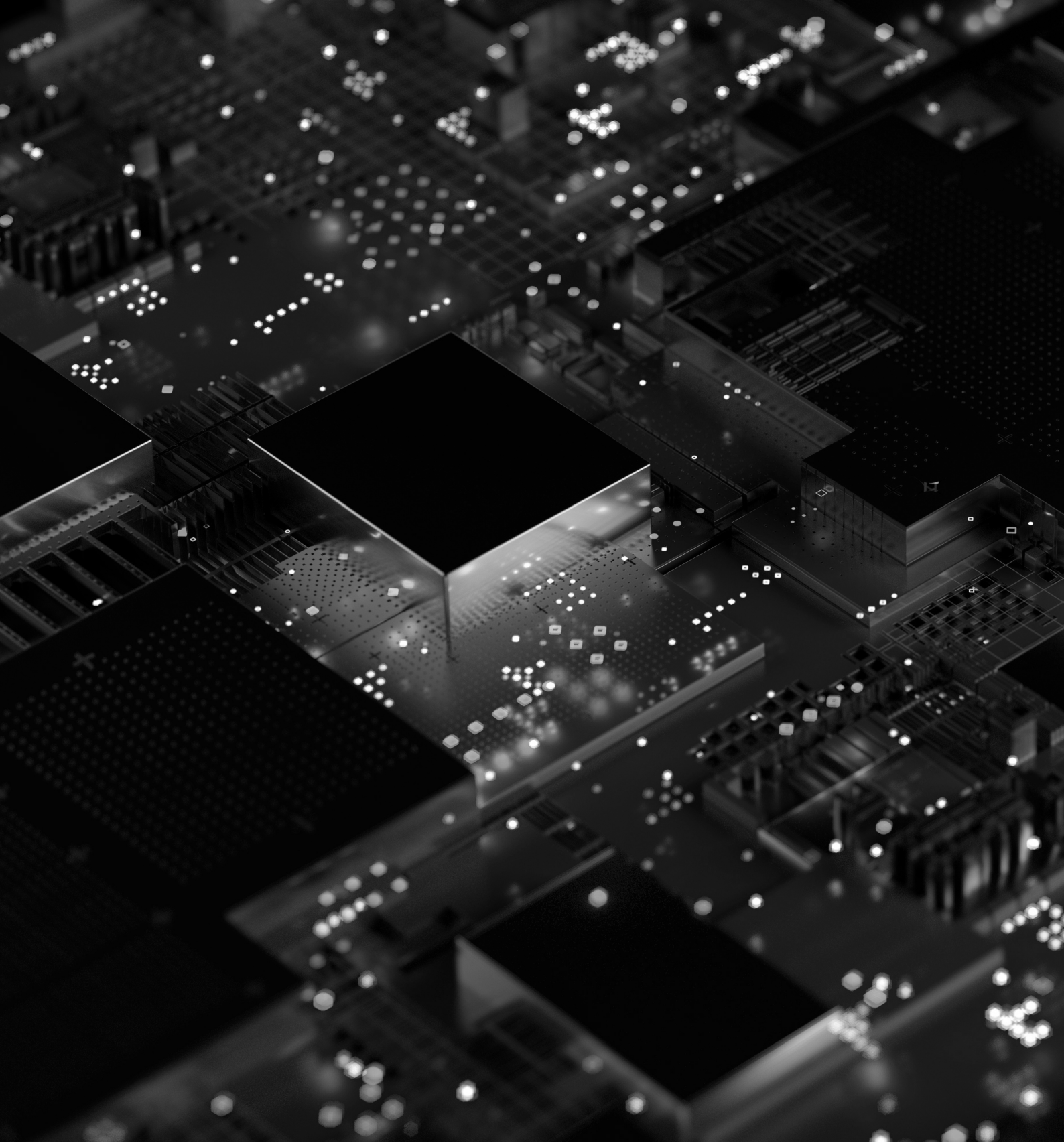

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