STATUS OF PROVISIONING OF MATERNAL HEALTH SERVICES DURING THE COVID-19 PANDEMIC: A STUDY IN TWO DISTRICTS OF ASSAM

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STATUS OF PROVISIONING OF MATERNAL HEALTH SERVICES DURING THE COVID-19 PANDEMIC: A STUDY IN TWO DISTRICTS OF ASSAM

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Introduction

Maternal Mortality Ratio (MMR) is one of the major areas of concern for Assam with the highest MMR among all states and UTs across India (215 per 100,000 live births)). World over, one of the key approaches to reducing maternal mortality is paying special attention to high-risk pregnancies. The presence of Accredited Social Health Activists (ASHAs) and outreach services such as Village Health Sanitation and Nutrition Days (VHSNDs) could be instrumental in reducing the MMR by recording and monitoring high-risk pregnancies and thus reducing the preventable deaths. During the COVID-19 pandemic and the lockdown, the health machinery at all levels including the village level focused on COVID-19 services resulting in other necessary services getting hampered. A study on status of maternal health services during the COVID-19 pandemic was thus planned in two districts of Assam, viz.,Kamrup (R.) and Darrang with the objective i) to know the status of maternal health service provisioning from public health facilities during the COVID-19 pandemic; and ii) to understand the challenges/ barriers faced in accessing/ providing maternal health services from public health facilities during the COVID-19 pandemic.

Methodology

In a mixed method study,The respondent categories included 114 Pregnant women/ Women who delivered within the study time frame, 23 ASHAs, Public health facility staff members (13 ANMs and 2 M.O.s) and 18 VHSNC members from the two districts. Telephonic interviews were conducted with the randomly selected pregnant/ recently delivered women from the list of women obtained by Piramal Swasthya Management and Research Institute (PSMRI) research team. For all other categories, the sample selection was purposive. An informed consent was sought from all the participants before conducting the interviews.

Findings

Pregnant and recently delivered women

The study looked at the impact of COVID-19 pandemic and the lockdown on the service provision. There has been very little effect on women receiving the ANC, delivery and the PNC services.8 3.7 per cent women received a minimum of four ANCs. The number of ANCs and the services received observed in this study are in accordance with HMIS data from the previous year. Although the ANCs are done from a government health facility, the expenditure for ANC services is high on account of the sonographies done in the private sector.

Current study sample showed high levels of stillbirths (8 stillbirths among 75 deliveries) and early neonatal deaths (4 babies died immediately after birth) even when most deliveries were institutional deliveries (73 out of 75 deliveries) and most births were attended by TBAs (66 out of 67). Proportion of deliveries conducted in government health facilities (58 deliveries) was higher compared to the deliveries in private health facilities (15 deliveries). Higher level of C-section deliveries in both the public and private health facilities were observed. Almost all the deliveries in private health facilities were performed through C-section.

Role of the VHSNC members

The VHSNC members could not help the pregnant women with guidance about the health care facility for their maternal health care needs when the VHSND processes in the villages had stopped during the lockdown. VHSNC members in Kamrup were not trained on COVID-19 protocol either.

Role played by the Health care providers

Even with additional burden of COVID-19 related surveillance duties, the ANMs and doctors performed ANCs. Non-availability of laboratory services was one of the major gaps in the ANC provisioning. Even with the additional duties of monitoring of home quarantine cases and home to home visits for surveillance, ASHAs have been able to assist the women in accessing the health facilities for the delivery in most of the cases. 97 out of the 99 deliveries were institutional and the ASHAs attended and supported 95 of these deliveries.

Conclusion

The women, in general, faced very few challenges except in the case of changing their place of delivery or traveling farther to the place of delivery. COVID-19 pandemic and the subsequent lockdown changed very few things at the ground level for maternal health service delivery for these women. The reporting of C-section deliveries is high compared to the recommended C-section rate considered by the WHO (10-15 per cent). The reasons for this increase and the need for C-section should be explored further.

Lack of provision of laboratory services from the government health facilities resulted in higher expenditure for accessing these services (sonography and other lab tests) from the private health facilities. The expenses can be reduced considerably with the regular provision of laboratory services from the government health facilities.

Policy Recommendations

- Community reliant health service provision mechanisms will be more sustainable especially in case of crises such as the COVID-19 pandemic with restrictions on travel. For this, the ground level structures such as VHSNCs and ASHAs should be strengthened further and their roles should be linked with each other. They should be able to work together as a part of one system.
- A high out of pocket (OOP) cost was reported despite the assurance of no-cost delivery in NHM. This needs to be taken seriously and a third party audit may be required in a sample of districts to investigate the reasons. Additionally, ensuring essential ANC and delivery services, emergency neonatal services, laboratory services and uninterrupted medicine supply to continue the service provision during future public health emergencies will help in ensuring less OOP expenditure and better usage of the services.

- VHSNC members need to be given refresher trainings for them to work effectively at the village level. The study also highlighted the need for VHSNC members to be trained on public health emergency measures.
- Mechanisms need to be placed for monitoring the service provisioning at the village level as well as at the health facility level to keep a check on lack of service provision as well as overmedicalization.
- Technology enabled services need to be provided to give better facility to the community such as Telemedicine for better reach to overcome the challenge of traveling to farther health facilities.

Recommendations for further research

- A study on the rise of C– section needs to be undertaken to find the cause of the rise. A Caesarean audit may be instituted especially in private facilities.
- A study to understand the high proportion of still-births can be designed.

ABOUT THE STUDY

Introduction

Maternal Mortality Ratio[1] (MMR) is one of the major areas of concern for Assam with the highest MMR among all states and UTs across India (215 per 100,000 live births[2])). The state targets an annual average reduction rate of 8.71 per cent MMR to reach the 2030 target of 70 MMR/100,000 live births. However, with the various interventions in place, it has achieved an annual average reduction rate of 3.38 per cent since 2014, satisfying less than half the expected reduction rate.

World over, one of the key approaches to reducing maternal mortality is paying special attention to high-risk pregnancies[3]. In the year 2019-20, 1676 maternal deaths[4] were anticipated in Assam, mostly among the high-risk cohort. In 2019-20, Assam expected 1.65 lakh cases of high-risk pregnancies[5], out of which only 49,994 (7.36 epr cent) of pregnancies were identified as high risk by the public health system.

In recent times, Accredited Social Health Activists (ASHAs) are seen as instrumental in reaching out to the marginalised communities to provide maternal health services[6]. The importance of outreach services such as Village Health Sanitation and Nutrition Days (VHSNDs) in improving the service provision and involvement of the community is emphasised in a recent study across seven states of India[7]. These local-level processes could be instrumental in reducing the MMR by recording and monitoring high-risk pregnancies and thus reducing the preventable deaths.

In March 2020, India was hit by the COVID-19 pandemic. Although it was restricted to a few cities at the beginning of March, towards the end of the month, there was a perceived heightened risk for the rural areas as well given a number of factors including *ill-equipped and insufficient public health centres and district hospitals*[8]. A national lockdown was thus declared from March

1 The maternal mortality ratio (MMR) is defined as the number of maternal deaths during a given time period per 100,000 live births.

2 Special bulletin on maternal mortality in India 2016-18, July 2020

3 https://apps.who.int/iris/bitstream/handle/10665/250796/9789241549912-eng.pdf;jsessionid=CD633EEF7F45D33B2C075E018A85CA10?sequence=1

4 HMIS 2019-20: Estimated Live birth for Assam 731857 (Maternal deaths as per 229 MMR per 100 000 live births)

5 RCH 2019-20: Estimated pregnancies for Assam 8,24,700 (15% over total pregnancies)

6 Agarwal, S., Curtis, S.L., Angeles, G. et al. The impact of India's accredited social health activist (ASHA) program on the utilization of maternity services: a nationally representative longitudinal modelling study. Hum Resour Health 17, 68 (2019). https://doi.org/10.1186/s12960-019-0402-4

7 Sharma N, Sharma M, Jagtap D, Deshmukh A, Hegde S, Kumar A. Revamping village health sanitation and nutrition days for improved delivery of maternal and child health services at village level – Experiences from a pilot phase study. Indian J Public Health 2020;64:345-50

8 https://idronline.org/the-implications-of-covid-19-for-rural-india/

25, 2020, which continued till May 31, 2020. The process of unlocking started from June 2020. During the lockdown, the health machinery at all levels including the village level focused on COVID-19 services. During this period other necessary services got hampered. This will have a long-term impact on health outcomes. For example, the lack of access to contraceptives during the lockdown will result in increased numbers of unintended pregnancies, unsafe abortions and even maternal deaths[9].

Given this scenario, SAHAJ (Society for Health Alternatives), the Action North-East Trust (the ant) and Piramal Swasthya Management and Research Institute (PSMRI) Assam felt a need for understanding various facets of the impact of lockdown restrictions on other women-specific services. A study on status of maternal health services during the COVID-19 pandemic was thus planned in two districts of Assam, viz.,Kamrup (R.) and Darrang.

Methodology

Kamrup (R.) and Darrang districts were chosen based on the presence of grassroots partner organizations DiYA Foundation in Kamrup (R.) and Manab Kalyan in Darrang. The two districts also present different geographies. Darrang belongs to central Assam and lies on the North West side whereas Kamrup (R.) belongs to the lower Assam division. Kamrup (R.) has better physical infrastructure and geographical access to the health facilities as compared to Darrang[10].

The objectives of this study were-

- to know the status of maternal health service provisioning from public health facilities during the COVID-19 pandemic; and
- to understand the challenges/ barriers faced in accessing/ providing maternal health services from public health facilities during the COVID-19 pandemic.

The time frame for the data for pregnant and recently delivered women from March 25, 2020 (the day on which the first national level lockdown was announced) until October 31, 2020. The dates of data collection For all other respondent categories, the time frame for data collection was from March 2020 to December 2020. The data collection was done in January 2021. were October 28th 2020 – November 3rd 2020. The respondent category wise sample size is given in the table below:

Respondent category	Sample size
Pregnant women/ Women who delivered within the study time frame	114
ASHAs	23
Public health facility staff members- Subcentres (ANMs) and PHCs (MOs & providing antenatal check up (ANC) ANMs/staff nurses)	13 ANMs
	2 M.O.s
VHSNC members	18

9 https://pratigyacampaign.org/wp-content/uploads/2020/05/impact-of-covid-19-on-indias-family-planning-program-policy-brief.pdf

10 Buragohain, Pranjal. (2015). STATUS OF RURAL HEALTH INFRASTUCTURE OF ASSAM. IJMSRR.

Sample selection

Data obtained by Piramal Swasthya Management and Research Insititute (PSMRI) research team of pregnant women from month of March 2020 to July 2020 was filtered according to the following inclusion criteria–

- Estimated Date of Delivery from March 2020 to March 2021
- Women with mobile phones belonging to themselves, their husband, relatives or neighbours/ friends

For the selection of pregnant/ recently delivered women, a serial number list produced by the Random Number Generator was used. Phone numbers corresponding to the chosen serial numbers were shortlisted for inclusion in the study. The research team contacted the respondents for seeking consent for the interviews and telephonic interviews were conducted with these participants upon the informed consent of the participants. The refusal to participate was documented as well.

For all other categories, the sample selection was purposive. The local organizations contacted the respondents, explained the study objectives, their role in the study and the usefulness of the study. After seeking an informed consent, they conducted one to one interviews with these respondents.

Training of field investigators

The local organization staff members were trained for different technical aspects of maternal health. Before the data collection, the were also trained for the tools used in data collection and orientation about the ethical aspects of the study.

Ethics review process

The Institutional Ethics Committees at both SAHAJ and PSMRI reviewed and passed the study proposal and the tools of data collection before the data collection.

Limitations of this study

As the pregnant and recently delivered women were interviewed on a telephonic call, the most marginalised with no access to phones couldn't be covered in this study. However among women who did not own a phone, if any of the family members owned a phone they were included in the universe for selection of sample.

Profile of the study population

<table>
<tr><td>Pregnant and Recently delivered women</td><td>The study population included 114 pregnant and recently delivered women from different blocks of the two districts. The distribution of women is as follows-
<table>
<tr><th></th><th>Darrang</th><th>Kamrup (R.)</th><th>Total</th></tr>
<tr><td>Total interviewed women (n)</td><td>50</td><td>64</td><td>114</td></tr>
<tr><td>Women who received Antenatal Check-up (ANC) during the reference period</td><td>49
(98%)</td><td>61
(95%)</td><td>110
(96.5%)</td></tr>
<tr><td>Women who delivered during the reference period</td><td>39
(78%)</td><td>36
(56%)</td><td>75
(66%)</td></tr>
<tr><td>Women who received Postnatal Check-up (PNC) during the reference period</td><td>29
(58%)</td><td>29
(45%)</td><td>58
(51%)</td></tr>
<tr><td>Women who received ANC, delivery services and PNC during the reference period</td><td>28
(56%)</td><td>26
(41%)</td><td>54
(47%)</td></tr>
</table></td></tr>
<tr><td>ASHAs</td><td>The study population included 23 ASHAs- 20 from Darrang and three from Kamrup (R.). All 20 ASHAs from Darrang are from villages in Pathorighat block of the district. The three ASHAs from Kamrup (R.) are from two blocks- Boko and Azara.</td></tr>
<tr><td>Village Health Sanitation and Nutrition Committee (VHSNC) members</td><td>18 VHSNC members (15 from Darrang and three from Kamrup (R.) were interviewed from 12 different villages.</td></tr>
<tr><td>Health facility staff</td><td>Total 13 ANMs and two doctors have been interviewed. Both the doctors were from Kamrup (R.) whereas three ANMs were from Kamrup (R.) and 10 were from Darrang.</td></tr>
</table>

Findings

Pregnant and recently delivered women

A contact was established with 150 women out of the 634 women contacted over the phone by the research team. Out of these 150 women, 114 agreed to participate in the study. 52 respondents were contacted on their own phones whereas remaining 62 respondents were contacted on phones owned by husband, other family members or neighbours.

These women were asked questions about the maternal health related services received during the reporting period of March to October 2020. Following section gives details of the findings from these interviews.

Access to ANC services

110 out of the 114 interviewed women received ANC during the reporting period (March to October 2020).

Table 1: Number of ANCs during the reporting period (March to October 2020)

Number of ANCs	Count	Per cent
More than four times	60	54.6
Four times	32	29.1
Thrice	6	5.5
Twice	8	7.2
Once	4	3.6
Grand Total	110	100.00

ANC services

The respondents were asked whether they received following 10 components of ANC services. Tetanus Toxoid Injection, IFA Tablets, Hb Test, BP, Random Blood Sugar, Urine Pregnancy Test, Weight, Height, Physical Examination and USG/Sonography.

104 women (91.2 per cent) received eight or more services from the list. 43 women among these (39.4 per cent) received all the 10 services during the reporting period. Only 3 women received less that 5 services.

Place of ANC

104 women (94.5 per cent) received ANC from a government health facility. 90 women (81.8 per cent) received their last ANC in a subcentre. 14 women (12.7 per cent) went to a PHC or other government health facility for ANC. Only one woman was visited at home by ANM for her ANC and three women visited a private health facility for their check-up.

Mode of travel

The preferred mode of travel for the ANC was either 'on foot' (45.9 per cent) or 'by a private vehicle' (45 per cent). The private vehicles included two-wheelers, four-wheelers and auto-rickshaws. 10 women (9.2 per cent) used public transport to reach the health facility.

Expenditure on ANC

30 women (27.3 per cent) didn't incur any expenses for ANC whereas 51 women (46.4 per cent) spent more than Rs. 1000 on one ANC. 46 out of these 51 women went to a public health facility and still had to spend the money. The increase in expenditure could be attributed to this service received from a private health facility, which added to the cost of the ANC services.

In total, 79 women (71.8 per cent) spent money on sonography. This was followed by expenditure on lab tests (24.3 per cent). Other expenses include expenses for medicines, consultation and transport which were reported by 10 per cent or less women.

Table 2: Break up of expenditure categories reported by the women

Money spent for-	Count (Multiple responses)	Per cent (n=110)
USG/Sonography	79	71.8
Lab tests	27	24.5
Medicines	12	10.9
Consultation	8	7.3
Transport	8	7.3

Highlights for ANC services

COVID-19 pandemic and the subsequent lockdown did not seem to have any effect on ANC services for women in these two districts. The number of ANCs and the services received observed in this study are in accordance with HMIS data from the previous year.

Although the ANCs are done from a government health facility, the expenditure for ANC services is high on account of the sonographies done in the private sector.

Access to delivery services

75 interviewed women delivered during the reporting period (March to December 2020).

Place of delivery

All except deliveries institutional deliveries. One of the home deliveries was conducted by ASHA and another by a friend/family member/ neighbour. 58 out of the 73 institutional deliveries were conducted in a government health facility.

Mode of delivery: Vaginal delivery vs C-section

Out of 75 deliveries, 32 were C-section deliveries (19 in government health facilities (Out of 58 deliveries) and 13 in private health facilities (Out of 15 deliveires). The distribution of women based on the type of health facility for the delivery and the mode of delivery is presented in the table below.

Table 3: Number of women according to the place of delivery and the mode of delivery

Place of delivery	C- section	Vaginal	Total
Government Health Facility	**19**	**39**	**58**
Private clinic/ Hospital	**13**	**2**	**15**
At home	**0**	**2**	**2**
Total	**32**	**43**	**75**

There were more C-section deliveries (20) than vaginal deliveries (16) in Kamrup (R.). Darrang had 12 C-section deliveries against 27 normal deliveries.

Mode of travel

Two-third women (50 out of 73) used private vehicle like a four-wheeler or an auto-rickshaw to reach the place of delivery. 21 women took ambulance.

Type of service provider

Trained birth attendents conducted 66 deliveries (54 by doctors, 7 by Nurse/ ANM and 5 by ASHAs). Friend/family member/relative performed one delivery which was conducted at home. Information about birth attendant is not available for eight respondents.

Expenditure for delivery

16 women did not spend any money on deliveries. These included two home deliveries and 14 deliveries in the government health facilities. Out of the 59 deliveries where they had to spend money, 44 deliveries were conducted in government health facilities and 15 were conducted in private health facilities. The amount spent for delivery ranged between less than Rs. 1000 to more than Rs. 10000. A high expenditure of above of ₹ 5000/- was reported by 43 of 75 (57 per cent) respondents and 24 respondents (30 per cent) reported and expenditure of more than ₹ 10,000/). Break-up of the categories of expenditure is given in the following table.

Table 4: Category wise expenditure for deliveries

Categories of expenditure	Count- multiple responses (n=59)	Per cent (Out of total repsonses= 150)
For medicines	51	34.0
For Lab tests	36	24.0
For consultation fees	24	16.0
For the transport	20	13.3
For blood transfusion	19	12.7

The distribution of study sample according to the expenditure categories is given in the below table.

Table 5: Distribution of the amounts spent on deliveries

How much did you spend?	Count
More than Rs. 10000	24
Rs. 5001- Rs. 10000	19
Rs. 1000-5000	13
Less than Rs. 1000	3
No expenses	16
Total	**75**

Most of the women (54 out of 59) managed delivery related expenses from their household income or savings. Four women borrowed money or took loan. One woman had to take help from the relatives to meet the expenses.

Delivery outcome

Out of the 75 deliveries, 63 (including the two home deliveries) resulted in live births. Eight deliveries resulted in stillbirths and in four cases, the baby died after birth.

Seven of the eight stillbirths happened in a government health facility. Three deliveries were done by doctors, two by ANMs and one was delivered by an ASHA. For two deliveries, there is no definite information on the birth attendant.

All four cases where the baby died after birth, the delivery was performed in a government health facility and by a doctor.

In the case of all 63 live births, the condition of the mother and the baby was stable and healthy at the time of the interview.

Highlights for delivery related services

Although increase in proportion of institutional deliveries and deliveries done by trained birth attendants (TBAs) are considered to be the indicators of better maternal and child health outcomes, current study sample showed comparatively high levels of stillbirths and early neonatal deaths even when most deliveries were institutional deliveries (73 out of 75 deliveries) and most births were attended by TBAs (66 out of 67 for which information is available).

Higher level of C-section deliveries in both the public and private health facilities could be a matter of concern. Almost all the deliveries in private health facilities were performed through C-section.

Access to PNC services

Out of 63 live births, 54 women received PNC services during the study period (March to October 2020). Following table gives the distribution of place of PNC.

Table 6: The place of PNC

Place of PNC	Count
Sub Centre	39
Home visit by ASHA/AWW/ relative who is a doctor	6
Other Government Health Facility	5
Private clinic	3
AWC	1
Grand Total	**54**

Mode of travel

Out of the 48 women, who went to the health facility for receiving PNC services, 28 travelled by a private vehicle, 18 women went walking and two women travelled by bus.

Services received

The list of services received is given in the table below.

Table 7: PNC services received during the study period

PNC services	Count (n=54)
Mother's check-up	37
Counselling	39
Child's check-up	40
Immunization	25
Weight of the baby	23

Counselling was received by 39 women (out of 54) during PNC. Along with the regular topics (refer to Table 8) covered during the PNC counselling, COVID-19 care in general and New-born care during COVID-19 pandemic were covered during these PNC counselling sessions.

Table 8: Details of PNC counselling services received during the study period

Family planning methods	25
New-born care during COVID-19	24
Complementary feeding	18
Exclusive breastfeeding	15
Weaning and introduction of solid food	12
COVID care	9

Expenditure for PNC

Six of the 54 women receiving PNC spent money for these services. The money was spent on transportation (four women) and consultation fees (three women) and medicines (two women). The expenses ranged from less than Rs. 100 (two women) to more than Rs. 1000 (two women).

Effect of COVID-19 Pandemic

All 114 women interviewed were asked if they faced any issue while accessing ANC/ delivery/ PNC services during the COVID-19 pandemic. Eight women faced some issues.

These are given in the following table.

Table 9: Issues faced by women in accessing ANC/delivery or PNC services during the reporting period

Reported issue	Count
Transport related issues	7
No one to accompany to the health facility	3
Non-availability of calcium tablets in subcentre	1
No health staff in the health facility because of COVID-19 duties	1
Had to visit a faraway facility	1
Spent more money	1

One of the effects of the COVID-19 pandemic is that seven out of seventy five women who delivered reported that they did not deliver in their preferred place of delivery. Five out of these seven women reported that they preferred to deliver in a primary health centre or any government health facility and three among these women had to deliver in a private clinic, one in a sub-centre and one in a medical college out of town. Among the remaining two women, one reported preference in delivering in a specific government health facility in Kamrup Rural, but delivered in a ESI hospital in Guwahati and the last respondent reported wanting to deliver in a government health facility in Darrang but had to resort to home delivery.

60 women out of the 114 were tested for COVID-19 during this period. All of them tested negative. 65 women received special counselling on pregnancy, child birth and new-born care in the context of COVID-19. This counselling was mainly given by ASHA (37 women) followed by ANM (15 women), AWW (7 women) and medical officer (6 women).

106 women knew about the preventive measures for COVID-19. The preventive measures included- 1. Frequent handwashing with soap, 2. Maintain physical distance in public places and 3. Wear masks outside the house.

Nine women (all from Kamrup (R.)) reported an instance of suspected COVID-19 or confirmed COVID-19 in the family/neighbouring houses during the period. Three women reported that their village fell under containment zone during the lockdown.

Highlights from interviews with pregnant/ recently delivered women

There has been very little effect on women receiving the ANC, delivery and the PNC services during the pandemic and the lockdown. The financial burden on the families for receiveing the services that are otherwise available free of cost is a matter of concern.

VHSNC members

A total of 18 VHSNC members from 12 villages were interviewed. All except two reported that the VHSNDs in their village did not happen for four months (March 23, 2020 to July 31, 2020).

17 out of 18 VHSNC members told that the pregnant women went to the ANM/ ASHA for the ANC while there were no VHSNDs. Three of them also communicated that the women went to the nearby health facility for the ANC.

Place of delivery

According to the VHSNC members, most of the deliveries during the lockdown period happened either in the nearby government health facility or a private hospital. Only one respondent said that some of the deliveries were home deliveries. This corroborates with the finding from the interviews with the recently delivered women that only two out of 75 deliveries were home deliveries. One respondent reported that all the women in their village went to a private health facility for the delivery.

According to 16 respondents, recently delivered women from their villages relied on the nearby health facility for the PNC. Three VHSNC members from Kamrup (R.) guided the women from their village in accessing the ANC/ delivery services/ PNC during the lockdown. The help was for making the transport services available (reported by all three), accompanying them to the health facility (reported by two) and guiding them towards the health facility (reported by one). None of the 15 VHSNC members from Darrang helped the women in accessing the services.

All 15 VHSNC members from Darrang received training on COVID-19 related infection control practices during the pandemic. None from Kamrup (R.) received any such training. Sixteen respondents reported that regular VHSNDs started in their villages post lockdown. In all except one the VHSNDs were organized using a staggered approach[11]. No such approach was mentioned

11 Staggered approach- For each session, the beneficiaries are divided into hourly slots so that 5-10 beneficiaries are allocated per hour.

by the VHSNC member from the remaining village. One respondent reported a maternal death from their village during the pandemic.

Health care providers

Health facility staff (13 ANMs and 2 doctors) and 20 ASHAs were interviewed to understand the situation of maternal health service provisioning during the lockdown in their respective areas and their response to the pandemic.

Role of health facility staff

The health facility staff were asked about the situation of maternal health service provisioning from their health facilities during the lockdown. Their responses are summarised in the table below-

Table 10: Role of health care providers in maternal health service provisioning during the reference period

Responses from the health facility staff-	Responses (n=15)
ANC/ PNC cases were managed through home visits by health facility staff (LHV/ ANM)	11
The staff could not attend to other patients because they were busy with COVID-19 management	10
Pregnant mothers did not come for check-up during the COVID-19 lockdown	10
Only few ANC/PNC cases in the health facility	10
Home visits by village level workers (ANM from subcentre/ASHA)	8

11 ANMs and both the doctors received training on COVID-19 related infection control practices. All 15 of them received necessary supplies like masks, sanitisers, personal protective equipment during the COVID-19 pandemic. The health facility was open throughout the lockdown period.

Different services provided from the health facility under ANC in the reporting period are summarised in the following table-

Table 11: Services provided under ANC during the reporting period

ANC services	Count (n=15)
Provision of IFA	15
Provision of Tab. Cal.	10
Measuring Weight	11
Measuring blood pressure	10
Giving TT Inj.	11

The laboratory services provided during the COVID-19 pandemic are summarised below-

Table 12: Provision of laboratory services from the health facilities during the reporting period

	Count (n=15)
Haemoglobin Test/ Haemogram	5
Urinary Pregnancy Test	7
Urine analysis	5
Rapid Malaria Test	3
Random Blood Sugar Test	9
Blood grouping	6

According to 11 respondents, procedures like wearing masks and PPE kits, using sanitizers and maintaining physical distance were followed in their health facilities. Ten of them reported that the pregnant women presenting COVID-19 like symptoms were sent for testing/ screening. Three ANMs and both the doctors faced difficulties in providing health care services to pregnant women because of the COVID-19 pandemic and the lockdown. The routine laboratory tests could not be done during the lockdown. The staff faced issues in travelling to the villages for home visits because of lack of travel options to reach remote areas. Six ANMs came across high-risk pregnancies during the pandemic. These were managed through home visits. In one case, the woman delivered at home as there were issues in getting an ambulance in an emergency and except ASHA, there was no other health care provider present at the time of the delivery. No maternal death was reported during the COVID-19 pandemic by any of the health facility staff.

Observations from health facility staff interviews

Even with additional burden of COVID-19 related surveillance duties, the ANMs and doctors performed ANCs. Non-availability of laboratory services was one of the major gaps in the ANC provisioning . Both these points were confirmed from interviews with the pregnant/ recently delivered women. 75 out of 104 women receiving ANC from government health facilities and 26 out of 58 women delivering in government health facilities spent money on laboratory tests.

Role of ASHAs

Eight out of the 23 ASHAs could not provide any of the health services to the pregnant women in their village during the COVID-19 pandemic and the lockdown. The health services included mobilising women for ANC and PNC, accompanying pregnant mothers to the health centre and provision of IFA tablets. The reasons for non-provision of the services were fear of COVID-19 infection, lack of enough PPE kits and directive from the system to focus on COVID-19 related work. The pregnant women managed on their own or with the help of the family in these situations (reported by four ASHAs) or they contacted the doctors on their own (reported by four ASHAs). Rest of the ASHAs (15) did not face any issues in providing health services during this period.

An average of 4 pregnant women (Total= 89, Range- Min.=1, Max.=10) were registered under these ASHAs at the time of the interview. 13 ASHAs told that all of the pregnant women (60 women) registered under them missed at least one ANC/ PNC. This means two-third women

registered under the 23 ASHAs interviewed (60 out of total 89 registered) missed at least one ANC/ PNC during the lockdown. One ASHA said that she needed to consult a health professional on an emergency basis during the lockdown. She took the pregnant woman to a private hospital using a private vehicle. Out of the 99 deliveries reported by the ASHAs during the reporting period, only two were home deliveries. Amongst 97 institutional deliveries, ASHAs attended and supported 95 deliveries. 55 institutional deliveries happened in government health facilities whereas 42 happened in private health facilities.

The services provided by ASHAs under ANC during the reporting period are summarised in the table below-

Table 13: Distribution of ANC services provided by ASHAs during the reporting period

Service	Number of ASHAs who could provide the service
Provision of IFA	14
Provision of Tab. Cal.	3
Measuring the Weight	15
Measuring the blood pressure	15
Giving TT Inj.	15
Measuring Hb using Haemoglobinometer	15

All the ASHAs from Darrang district reported shortage of Calcium tablets during the reporting period.

All ASHAs were able to keep in touch with the SC-ANM for getting guidance or sending reports during the lockdown period. They were also able to follow up with high risk pregnant women (through phone call/ visits) during the lockdown. Three ASHAs from Kamrup (R.) did not receive any training on COVID-19 related infection control practices whereas all the 20 ASHAs from Darrang received the training. All ASHAs received necessary supplies like masks, sanitizers, personal protective equipment.

All the ASHAs were assigned COVID-19 related duty during the reporting period. The duties included monitoring of home quarantine (23 respondents) and home to home visits for surveillance (21 respondents).

For continuing the ANC/ PNC in their areas during the crises such as COVID-19 pandemic, the ASHAs asked for support from the ANMs and doctors. Other requirements include provision of laboratory equipment and contact details for ambulance to carry the patients in emergency.

None of the ASHAs reported any maternal death in their area during the reporting period.

Highlights from interviews with ASHAs

The data on proportion of institutional deliveries from the reporting of ASHAs further strengthens the data from recently delivered women. The proportion of institutional deliveries remained high despite the COVID-19 pandemic and the lockdown. With the additional duties of monitoring of home quarantine cases and home to home visits for surveillance, ASHAs have been able to assist the women in accessing the health facilities for the delivery in most of the cases. ASHAs would need handholding by the system (especially the immediate contact- ANMs) in order to provide the services more effectively.

Observations of the field partners during the data collection process:

1. During the initial 3 ½ months of the lockdown (March end till mid July 2020), it was extremely difficult for pregnant women and their families to access health facilities because of complete lockdown.

2. During an interview in Kamrup (R), one medical officer said that certain mandatory tests during pregnancy could not be done in the health centres.

3. Village level health centres were closed for three months. Even if it opened later, the stock for Iron and Folic Acid tablets was not available except for Mini PHCs but reaching these facilities was also difficult owing to non-availability of transportation.

4. **ASHAs and ANMs** – it was difficult for ASHAs and ANMs to continue the services provision because of the fear of spreading of the virus. Notwithstanding, ASHAs and ANMs have done outstanding jobs. They made home visits on a regular basis and coordinated with the pregnant women/families over telephone. Suggestions for intake of alternative food items to supplement iron requirements were also made. However, it is difficult to say that pregnant women from low economic income groups could eat alternative supplements owing to the disruption of income of families due to lockdown.

5. **VHSNC members-** During the lockdown period, not a single VHSND took place in the study areas. During interviews with VHSNC members, it was observed that they lack knowledge of their roles and responsibilities. In both the districts, it was found that ASHAs and ANMs were not aware of other VHSNC members. Convergence of VHSNC members, ASHAs and ANMs is still a distant cry. Intervention is required in this regard.

Discussion

Most of the indicators from this study coincide with those collected by HMIS every year. Major findings from NFHS-5 (2019-20) at the state as well as district level are also available for comparison. In this section, we review important findings of the study in the light of HMIS (2019-20) and NFHS-5 (2019-20) to understand the effect of COVID-19 pandemic and the lockdown on the access to maternal health services during March- December 2020.

Access to ANC services

In the current study, 83.7 per cent women received a minimum of four ANCs. HMIS data for Assam for 2019-20 also show similar findings with 85.3 per cent women receiving four or more ANCs. NFHS-5 however shows lower percentage of pregnant women in Assam reporting four or more ANCs (Refer to Table 13).

Table 14: Percentage of women with four or more ANC visits, NFHS-5 (2019-20), HMIS (2019-20) and current study

Indicator	Darrang			Kamrup (R.)			Assam		
	NFHS-5 (2019-20)	HMIS (2019-20)	Current study (March to Novmber 2020)	NFHS-5 (2019-20)	HMIS (2019-20)	Current study (March to Novmber 2020)	NFHS-5 (2019-20)	HMIS (2019-20)	Current study (March to Novmber 2020)
Per cent of women who had at least four ANC visits	37.5	93.1	95.9	46.9	82.8	73.7	50.7	85.3	83.7

Access to delivery services

In the current study, all except two were institutional deliveries. Proportion of deliveries conducted in government health facilities (58 deliveries) was higer compared to the deliveries in private health facilities (15 deliveries).

Finding from HMIS data from 2019-20 show similar distribution of institutional and home deliveries in the two districts. NFHS-5 also shows an increase in institutional births in these two districts and at the state level as compared to NFHS-4. There is also an overall increase in deliveries in public health facilities from NFHS-4 (2015-16) to NFHS-5 (2019-20).

Table 15: HMIS (2019-20) and NFHS-5 (2019-20) data for deliveries for Darrang and Kamrup (R.) districts and Assam

Indicator	Source	Darrang	Kamrup (R.)	Assam
Per cent of institutional deliveries	HMIS (2019-20)	97.2	98.2	91.2
	NFHS-5 (2019-20)	84.4	85.0	84.1
Per cent of home deliveries to total reported deliveries	HMIS (2019-20)	2.8	1.8	8.8
Per cent of deliveries conducted at public institutions to total institutional deliveries	HMIS (2019-20)	95.9	85.1	83.6
	NFHS-5 (2019-20)	81.1	69.8	74.4
Per cent of deliveries conducted at private institutions to total institutional deliveries	HMIS (2019-20)	4.1	14.9	16.4

Stillbirths

Out of the 75 deliveries eight deliveries resulted in stillbirths. This is almost ten times of 12.8 per 1000 total births reported in Annual Health Survey (2010-2013) for Assam[12] and five times of 20.9 per 1000 total births reported in HMIS (2019-20).

C-section deliveries

Very high levels of C-section deliveries are reported from the current study (32 C-section deliveries amongst 75 total deliveries), especially from Kamrup (R.) district (20 C-section deliveries as against 16 vaginal deliveries).

NFHS-5 data for the state as well as the two districts have also shown an increase in C-section deliveries for both public and private health facilities. HMIS data for 2019-20 also shows higher percentage of C-section deliveries in these two districts as well as for Assam as compared to the data from previous year (2018-19).

12 Altijani N, Carson C, Choudhury SS, et al. Stillbirth among women in nine states in India: rate and risk factors in study of 886,505 women from the annual health survey. BMJ Open 2018;8:e022583. doi:10.1136/ bmjopen-2018-022583

Table 16: HMIS (2018-19) and (2019-20) and NFHS-5 (2019-20) data for deliveries by C-section in Darrang and Kamrup (R.) districts and Assam

	Source	Darrang		Kamrup (R.)		Assam	
		2019-20	2018-19	2019-20	2018-19	2019-20	2018-19
Proportion of C-section deliveries (Per cent) (Total)	HMIS	11.2	8.8	21	19.9	23.5	22.7
	NFHS-5	10.8	-	32.8	-	18.1	-
Proportion of C-section deliveries (Per cent)(Public health facilities)	HMIS	8.1	5.3	12.1	12.5	15.3	15.3
	NFHS-5	10.0	-	31.1	-	15.2	-
Proportion of C-section deliveries (Per cent)(Private health facilities)	HMIS	82.6	83.7	72.4	67.3	69.5	60.8
	NFHS-5	-	-	72.4	-	70.6	-

Very high proportion of C-section deliveries are observed in private health facilities as compared to the public health facilities in the current study as well as in HMIS (2019-20) and NFHS-5. A recent study based on the data from NFHS-4 has concluded that the likelihood of C-section delivery in a private health facility is higher as compared to a public health facility regardless of other medical and economic factors[13]. The study further categorises 'place of delivery' as the *most important structural factor* of delivery by C-section.

Community participation- Role of ASHAs and VHSNC members

Community participation becomes crucial in situations like the one posed by the COVID-19 pandemic. ASHAs and VHSNC members are the official community representatives in the system. The role of ASHAs in the improved utilization of ANC services, skilled birth attendance and institutional births is highlighted in a recent study[14]. Data sought from ASHAs in current study underlines their important role in institutional deliveries. 97 out of the 99 deliveries were institutional and the ASHAs attended and supported 95 of these deliveries.

The VHSNC members could not help the pregnant women with guidance about the health care facility for their maternal health care needs when the VHSND processes in the villages had stopped because of the lockdown. VHSNC members in Kamrup were not trained on COVID-19 protocol either. Other studies have spelled out the lack of formal training and its need for the VHSNC members about their roles and responsibilities in the mobilization at the village level[15].

13 Bhatia, M., Banerjee, K., Dixit, P., & Dwivedi, L. K. (2020). Assessment of Variation in Cesarean Delivery Rates Between Public and Private Health Facilities in India From 2005 to 2016. JAMA network open, 3(8), e2015022. https://doi.org/10.1001/jamanetworkopen.2020.15022

14 Agarwal, S., Curtis, S. L., Angeles, G., Speizer, I. S., Singh, K., & Thomas, J. C. (2019). The impact of India's accredited social health activist (ASHA) program on the utilization of maternity services: a nationally representative longitudinal modelling study. Human resources for health, 17(1), 68. https://doi.org/10.1186/s12960-019-0402-4

15 Hamal, M., Dieleman, M., De Brouwere, V. et al. How do accountability problems lead to maternal health inequities? A review of qualitative literature from Indian public sector.Public Health Rev 39, 9 (2018). https://doi.org/10.1186/s40985-018-0081-z

Conclusion

The women, in general, faced a few challenges for example, in the case of changing their place of delivery or traveling farther to the place of delivery. COVID-19 pandemic and the subsequent lockdown changed very few things at the ground level for maternal health service delivery for these women. There was very little disruption in the service provision except for the first two months of complete lockdown. Most of the service delivery related findings of this study are commensurate with HMIS data from the previous year (2019-20) as well as NFHS-5 (2019-20) district-level data.

Both HMIS (2019-20) and NFHS-5 (2019-20) have shown a steady rise in the proportion of institutional deliveries, deliveries in public health facilities and deliveries done by trained birth attendants during last few years. The findings from current study also show high levels of institutional deliveries, deliveries in public health facilities and deliveries done by TBAs. Despite this, the high levels of stillbirths from this study are worrisome. Along with the institutional deliveries, the reporting of C-section deliveries is also high compared to the recommended C-section rate considered by the WHO (10-15 per cent)[16]. The reasons for this increase and the need for C-section should be explored further in more details.

Lack of provision of laboratory services from the government health facilities resulted in higher expenditure for accessing these services (sonography and other lab tests) from the private health facilities. The expenses can be reduced considerably with the regular provision of laboratory services from the government health facilities.

Even with additional burden of COVID-19 related surveillance duties, ANMs, doctors and ASHAs have been able to provide regular services with some hiccups. Through the interviews with VHSNC members, ANMs and ASHAs, the need for linking their roles at the local level in provisioning of maternal health services emerged. For effective implementation of the health service delivery at the local level, these important stakeholders need to work in tandem.

16 https://apps.who.int/iris/bitstream/handle/10665/161442/WHO_RHR_15.02_eng.pdf;jsessionid=C7AB42990376910F0A14C2B7372B5174?sequence=1

Recommendations

Policy Recommendations

- Community reliant health service provision mechanisms will be more sustainable especially in case of crises such as the COVID-19 pandemic with restrictions on travel. For this, the ground level structures such as VHSNCs and ASHAs should be strengthened further and their roles should be linked with each other. They should be able to work together as a part of one system.
- A high out of pocket (OOP) cost was reported despite the assurance of no-cost delivery in NHM. This needs to be taken seriously and a third party audit may be required in a sample of districts to investigate the reasons. Additionally, ensuring essential ANC and delivery services, emergency neonatal services, laboratory services and uninterrupted medicine supply to continue the service provision during future public health emergencies will help in ensuring less OOP expenditure and better useage of the services.
- VHSNC members need to be given refresher trainings for them to work effectively at the village level. The study also highlighted the need for VHSNC members to be trained on public health emergency measures.
- Mechanisms need to be placed for monitoring the service provisioning at the village level as well as at the health facility level to keep a check on lack of service provision as well as overmedicalization.
- Technology enabled services need to be provided to give better facility to the community such as Telemedicine for better reach to overcome the challenge of traveling to farther health facilities.

Recommendations for further research

- A study on the rise of C– section needs to be undertaken to find the cause of the rise. A Caesarean audit may be instituted especially in private facilities.
- A study to understand the high proportion of still-births can be designed.

ANNEXURES

Annexure 1: Questionnaires for Women

Status of provisioning of maternal health services during the COVID-19 pandemic: A study in two districts of Assam

Questionnaire for pregnant/ recently delivered women

Name (Not to be included in data entry): _____

District: _____ Block: _____ Village: _____

Phone Number (Not to be included in data entry): _____

Ownership of the phone: Self ☐ Family member ☐ Neighbour ☐

Date of interview: ____/____/_____ Time of interview: _____ : _____

Name of the interviewer: _____

No.	Question	Options	Skip
1	Did you receive any ANC services during the COVID-19 pandemic (March '20 – Present)?	Yes . . . . . .1 No 2	If the answer is 'NO' skip to 9
2	How many times have you received ANC during the COVID-19 pandemic (March 2020 to present)?	Once……1 Twice……2 Thrice……...3 Four times……4 More than four times……5	
3	In which month did your last ANC take place?		

4	Where did your last ANC take place?	Sub Centre……...1 Primary Health Centre……2 Other government facility (Specify)……...3 Home visit by ASHA/ ANM……4 VHSND……5 Private Doctor/Hospital……...6 Any other Explain)……..……..7	
5	How did you travel to the place of ANC?	On foot……...1 Private Vehicle - Car, authorickshaw……2 Public Transport - Bus/train/ferry……...3 Ambulance (government)……4 Any other (Explain)……5	
6	What are the ANC services you received? – tick (Multiple choices)	TT . . . . . .1 IFA . . . . . 2 Hb . . . . . .3 Weight . . . . 4 Height……..…..5 BP . . . . .6 UPT (first ANC) …… . . 7 Random Blood Sugar…… . 8 Physical examoination . . . . . 9 USG/ Sonography . . . . . .10 Others (Explain)……11	
7	How much money did you spend for one ANC visit?	No money……1 Less than Rs. 100 . . . .2 Rs. 101-500 . . . . . .3 Rs. 501- Rs. 1000 . . . .4 More than Rs. 1000 5	

8	What did you spend this money on?	For consultation . . . . . 1 For USG/ Sonography ……..2 For Lab tests ……...3 For the transport . . . . . .4 For medicines . . . . . 5 Any other (explain) _____ _____ _____	
9	Did you give birth during the COVID-19 pandemic? (March 2020 to present)	Yes……1 No……..2	If NO, Skip to question 22
10	Where did your delivery take place?	At home……1 At Sub Centre……2 Primary Health Centre……3 Other Government Facility (Specify)……...4 Private clinic/ Hospital……5 Other (Explain)……6	If Home, Skip to question 12
11	(For other than home) How did you travel to the place of delivery?	On foot……...1 Private Vehicle - Car, authorickshaw……2 Public Transport - Bus/train/ ferry……...3 Ambulance (government)……4 Any other (Explain)……5	
12	Was this the facility your preferred place of delivery?	Yes……1 No……2	If YES, skip to 14
13	If NO, where did you plan to deliver?	At home……1 At Sub Centre……2 Primary Health Centre……3 Other Government Facility (Specify)……...4 Private clinic/ Hospital……5 Other (Explain)……6	

14	Who performed the delivery?	Family member/ friend/ neighbour……1 Village dai……2 TBA……3 ASHA/ AWW……4 Nurse/ ANM……..5 Doctor……6 Others (Explain)……..7	
15	Did you spend any money for delivery services?	Yes……1 No……..2	If NO, skip to 19
16	If YES, what did you spend this money on?	For consultation fees……1 For lab tests……2 For the transport……..3 For medicines……..4 For blood……5 Any other……6	
17	How much did you spend?	Less than Rs. 100 . . . .1 Rs. 101-500 . . . . . .2 Rs. 501- Rs. 1000 . . . .3 More than Rs. 1000 4	
18	How did you pay for the delivery?	Household income/ Savings…1 Borrowings/ loans……...2 Contributions from friends and relatives……...3 Sale of physical assets (like livestock, jewellery)……..4 Public/ private health insurance……5 Received treatment under a Government scheme……6 Any other……7	
19	What was the mode of your delivery?	Normal Birth……..1 C-section……2	
20	What was the delivery outcome?	Live birth……1 Still birth……..2 Baby died after birth……3	If Still Birth or Baby died after birth, Skip to 22

21	What is the present condition of mother and child?	Stable and healthy……....1 Mother needs medical attention……..2 Child needs medical attention……..3 Others (Explain)……..4	
22	Did you receive any PNC services during the COVID-19 pandemic? (March 2020 to present)	Yes……1 No……..2	If NO, Skip to 31
23	In which month was your last PNC?		
24	Where did your last PNC check-up take place?	Sub Centre……..1 Primary Health Centre……2 Other Government Facility (Specify)……3 Private (Doctor/Others)……4 Home visit by ASHA/AWW..5 By ASHA/AWW somewhere in the village……6 VHSND……..7 Others (Explain)……..8	
25	What PNC services did you receive?	Mother's check-up……..1 Child's check up……2 Immunization……3 Weight of the baby……..4 Others (Explain)……..5	
26	Did you receive counselling during PNC?	Yes . . . . . .1 No 2	If NO, skip to 28
27	If YES, on what topics did your receive the counselling?	Family Planning Methods……1 Exclusive Breastfeeding……...2 Complementary feeding - Weaning and introduction of solid food……3 Newborn care during COVID-19……4 Others……..5	
28	Did you spend any money for PNC services?	Yes . . . . . .1 No 2	If NO, skip to 31

29	If YES, what did you spend this money on?	Consultation Fees……1 Transportation……..2 Medicines……..3 Immunisation……...4	
30	How much did you spend?	Less than Rs. 100 . . . .1 Rs. 101-500 . . . . . .2 Rs. 501- Rs. 1000 . . . .3 More than Rs. 1000 4	
31	Did you face any issues while accessing ANC/delivery/PNC services during the COVID-19 pandemic (from March 2020)?	Yes . . . . . .1 No 2	If NO, skip to 34
32	What were the issues you faced?	No vehicles……...1 Delay in transport……..2 Problem to travel even on foot because of lockdown……3 Had to travel to a health facility that was far away due to COVID-19……4 No one to accompany to health facility……..5 Health facility shut down due to COVID-19……...6 No health staff because of COVID-19……...7 Spent more money for treatment than usual……8 No money for treatment……...9 Any other (Explain)……10	
33	How did you overcome these issues (even if was unable to overcome the issues, what did the pregnant mother do)? _____ _____ _____ _____		
34	Have you been tested for COVID-19 during pregnancy or after delivery?	Yes……1 No……..2	If NO, skip to 38
35	What was your COVID-19 test result?	Positive……1 Negative…..……2	If Negative, skip to 38

36	What type of measures were taken when you tested positive for COVID-19?	Institutional Isolation . . .. 1 Home Isolation. . . . . 2 Other……3	
37	How was your treatment different in comparison to other COVID-19 patients?		
38	Have you been given any special counselling on pregnancy, child birth and newborn care in the context of COVID-19?	Yes 1	If NO, skip to 40
		No 2	
39	Who gave you this counselling?	ASHA……...1 ANM……2 AWW……...3 Medical Officer……4 CHO……5 Other (Explain)……6	
40	Do you know any preventive measures for COVID-19?	Yes……1 No……..2	If NO, skip to 42
41	If YES, what are they (Select multiple)	Frequent Handwashing with Soap……1 Maintain physical distancing in public places……2 Wearing masks outside the house……3 Other (Explain)……4	
42	Was there any instance of suspected COVID-19 or confirmed COVID-19 in the family/ neighbouring houses during the period?	Yes……..1 No……..2	
43	Did your village fall under the containment zone during any part of the lockdown period?	Yes……1 No……..2	

Annexure 2: Questionnaires for Doctors and ANMs

Questionnaire for doctors

Status of provisioning of maternal health services during the COVID-19 pandemic: A study in two districts of Assam

Questionnaire for M.O.s (Doctors) in Public Health Facilities

Name of the health facility (Not to be included in data entry): _____

District: _____ Block: _____ Village: _____

Name of the respondent (Not to be included in data entry): _____

Designation: _____

Phone Number (Not to be included in data entry): _____

Date of interview: ____/____/_____ Time of interview: _____ : _____

Name of the interviewer: _____

No	Question	Options	Skip
1	What is the situation of maternal health service provision from your health facility during the lockdown? (Options not to be read out- suggested multiple choices)	Busy with COVID. Could not attend to other patients……1 Pregnant mothers did not come for check-up/Dropped out. . . .2 Only few ANC/PNC cases in the health facility……..3 ANC/ PNC cases were managed through home visits by health facility staff (LHV/ ANM) ……4 Home visits by village level workers (ANM from subcentre/ ASHA). ……5 All services were provided from the health facility at first, but after the health facility staff was infected provision of services was interrupted……6 Any other (Explain) _____ _____ _____ _____	
2	Did you receive any training on COVID-19 related infection control practices?	Yes . . . . . .1 No 2	

3	Did you receive with necessary supplies like masks, sanitizers, personal protective equipment?	Yes . . . . . .1 No 2	
4	Were there any days in the lockdown during which the PHC was closed due to deputation for COVID-19related work?	Yes . . . . . .1 No 2	If No, Skip to 6.
5	If YES, for how many days was the PHC closed?	Number of Days:_____	
6	Were you consulting patients on the phone?	Yes . . . . . .1 No 2	
7	How many patients sought consultation over the phone during the lockdown?	Number of Patients: _____	

Maternal health related questions

8 Were you able to provide following since the lockdown?

No.	Service	Yes	No
8.1	Provision of IFA		
8.2	Provision of Tab. Cal.		
8.3	Measuring the Weight		
8.4	Measuring the blood pressure		
8.5	Giving TT Inj.		

9	Was there a provision of supplying IFA tablets to the homes of pregnant women during the lockdown?	Yes . . . . . .1 No 2	

10 What is the status of following laboratory tests? (Please tick in the appropriate column)

No.	Service	Provided before lockdown	Provided during lockdown
10.1	Haemoglobin Test/ Haemogram		
10.2	Urinary Pregnancy Test		
10.3	Urine analysis		
10.4	Rapid Malaria Test		
10.5	Random Blood Sugar Test		
10.6	Blood grouping		
10.7	VDRL and HIV Test		

11	If the health facility is a delivery point, was there any drop in average no of Deliveries conducted at PHC per Month, during lockdown compared to pre-lockdown period?	Average number of deliveries/ month before lockdown…… Average number of deliveries/ month during lockdown……....	
12	During COVID-19 pandemic, what procedure is followed in the health facility when a pregnant woman comes to the health facility for ANC/ delivery/ PNC? _____ _____ _____ _____		
13	Were pregnant women suspected for COVID-19infection referred for testing/ screening?	Yes . . . . . .1 No 2	
14	Were any such patients (suspects) denied health care?	Yes . . . . . .1 No 2	
15	Did you face any issues in service provision because of COVID-19/ the lockdown?	Yes . . . . . .1 No 2	If the answer is 'No', skip to 17
16	If yes, can you please explain? _____ _____ _____ _____		
17	Have you come across any high risk pregnancies/ deliveries during this time?	Yes . . . . . .1 No 2	If the answer is 'No', skip to 19
18	If yes, how have you managed those? _____ _____ _____ _____		
19	Was there anymaternal death you know during this time?	Yes . . . . . .1 No 2	If the answer is 'No', Thank the participants for their time and close the call
20	In case of Maternal death- - Name of the village/Sub Centre …… - Specify details under the circumstance death occurred _____ _____ _____ _____		

Questionnaire for ANMs

Status of provisioning of maternal health services during the COVID-19 pandemic: A study in two districts of Assam

Questionnaire for ANMs in PHCs and subcentres

Name of the health facility (Not to be included in data entry): _____

District: _____ Block: _____ Village: _____

Name of the respondent (Not to be included in data entry): _____

Designation: _____

Phone Number (Not to be included in data entry): _____

Date of interview: ____/____/_____ Time of interview: _____ : _____

Name of the interviewer: _____

No	Question	Options	Skip
1	What is the situation of maternal health service provision from your health facility during the lockdown? (Options not to be read out-suggested multiple choices)	Busy with COVID. Could not attend to other patients……1 Pregnant mothers did not come for check-up/Dropped out. . . .2 Only few ANC/PNC cases in the health facility……..3 ANC/ PNC cases were managed through home visits by health facility staff (LHV/ ANM) ……4 Home visits by village level workers (ANM from subcentre/ ASHA). ……5 All services were provided from the health facility at first, but after the health facility staff was infected provision of services was interrupted……6 Any other (Explain) _____ _____ _____	
2	Did you receive any training on COVID-19 related infection control practices?	Yes . . . . . .1 No 2	

3	Did you receive with necessary supplies like masks, sanitizers, personal protective equipment?	Yes . . . . . .1 No 2	
4	Were there any days in the lockdown during which the PHC was closed due to deputation for COVID-19related work?	Yes . . . . . .1 No 2	If No, Skip to 6.
5	If YES, for how many days was the PHC closed?	Number of Days:_____	
6	Were you consulting patients on the phone?	Yes . . . . . .1 No 2	
7	How many patients sought consultation over the phone during the lockdown?	Number of Patients: _____	

Maternal health related questions

8 Were you able to provide following since the lockdown?

No.	Service	Yes	No
8.1	Provision of IFA		
8.2	Provision of Tab. Cal.		
8.3	Measuring the Weight		
8.4	Measuring the blood pressure		
8.5	Giving TT Inj.		

9	Was there a provision of supplying IFA tablets to the homes of pregnant women during the lockdown?	Yes . . . . . .1 No 2	

10 What is the status of following laboratory tests? (Please tick in the appropriate column)

No.	Service	Provided before lockdown	Provided during lockdown
10.1	Haemoglobin Test/ Haemogram		
10.2	Urinary Pregnancy Test		
10.3	Urine analysis		
10.4	Rapid Malaria Test		
10.5	Random Blood Sugar Test		
10.6	Blood grouping		
10.7	VDRL and HIV Test		

11	If the health facility is a delivery point, was there any drop in average no of Deliveries conducted at PHC per Month, during lockdown compared to pre-lockdown period?	Average number of deliveries/ month before lockdown…… Average number of deliveries/ month during lockdown……....	
12	During COVID-19 pandemic, what procedure is followed in the health facility when a pregnant woman comes to the health facility for ANC/ delivery/ PNC? _____ _____ _____ _____		
13	Were pregnant women suspected for COVID-19infection referred for testing/ screening?	Yes . . . . . .1 No 2	
14	Were any such patients (suspects) denied health care?	Yes . . . . . .1 No 2	
15	Did you face any issues in service provision because of COVID-19/ the lockdown?	Yes . . . . . .1 No 2	If the answer is 'No', skip to 17
16	If yes, can you please explain? _____ _____ _____ _____		
17	Have you come across any high risk pregnancies/ deliveries during this time?	Yes . . . . . .1 No 2	If the answer is 'No', skip to 19
18	If yes, how have you managed those? _____ _____ _____ _____		
19	Was there anymaternal death you know during this time?	Yes . . . . . .1 No 2	If the answer is 'No', Thank the participants for their time and close the call
20	In case of Maternal death- - Name of the village/Sub Centre …… - Specify details under the circumstance death occurred _____ _____ _____ _____		

Annexure 3: Questionnaire for ASHAs

Status of provisioning of maternal health services during the COVID-19 pandemic: A study in two districts of Assam

Questionnaire

Name (Not to be included in data entry): _____

District: _____ Block: _____ Village: _____

Phone Number (Not to be included in data entry): _____

Date of interview: ____/____/_____ Time of interview: _____ : _____

Name of the interviewer: _____

No	Question	Options	Skip
1	Were you able to provide all maternal health related services during the lockdown?	Yes . . . . . .1 No 2	If the answer is 'No', Skip 2 If the answer is 'Yes', skip 3 to 5
2	If yes, which services did you provide during the lockdown?	Mobilise ANC visits…… 1 Mobilise PNC visits . .. . 2 Accompany pregnant mothers to the health center……..3 Provide them IFA tablets.....4 Called them over phone . . . . .5 In case of emergency they called me . . . . . .6 Any other (Explain) _____ _____ _____ _____	Go to 6
3	If No, which of your regular services were not provided during the lockdown?	Mobilise ANC visits.. … . . . . . 1 Mobilise PNC visits . .. . 2 Accompany pregnant mothers to the health center . . . . . .3 Provide them IFA tablets . . . .4 Any other (Explain) _____ _____ _____ _____	

4	What are the reasons for non provision of these services?	Fear of infection……1 Lack of PPEs……2 Directive from the system…..3 Any other (Explain) _____ _____ _____ _____	
5	If you were unable to provide the regular services, how do you think the pregnant mothers were able to take care of themselves?	Managed of their own/ their family . . . . . 1 They contacted the doctor themselves . . . . . .2 They did not require support during Covid 19 Situation . . .3 Don't know . . . . . 4 Any other (Explain) _____ _____ _____ _____	
6	How many pregnant women are registered under you currently?	SPECIFY	
7	How many pregnant women who are registered under you have missed one or more ANC/PNC during the lockdown?	SPECIFY	
8	During the lockdown, were there any cases for which you thought you needed to consult someone on emergency basis?	Yes . . . . . .1 No 2	If the answer is No, Skip 9
9	If yes, how did you manage those?	Told them to go to hospital ….1 Managed at home myself……..2 Managed at home with help from ANM / PHC MO ……...3 Managed at home with help from a private doctor ……..4 Took her to a Public hospital using 108 / private vehicle……5 Took her to a private hospital using 108 / private vehicle……6 Any other (Explain) _____ _____ _____ _____	
10	During the lockdown, how many deliveries took place in your work area that you know of?		

<table>
<tr><td>11</td><td>How many of these were home deliveries and institutional deliveries?</td><td>Home Deliveries:
Institutional Deliveries:</td><td></td></tr>
<tr><td>12</td><td>How many deliveries were you able to attend and support?</td><td>Home Deliveries:
Institutional Deliveries:</td><td></td></tr>
<tr><td>13</td><td>From among the institutional deliveries specify the number for each type of facility.</td><td>Public health facility:
Private health facility:</td><td></td></tr>
<tr><td>14</td><td colspan="3">Were you able to provide following since the lockdown?
<table>
<tr><th>No.</th><th>Service</th><th>Yes</th><th>No</th></tr>
<tr><td>13.1</td><td>Provision of IFA</td><td></td><td></td></tr>
<tr><td>13.2</td><td>Provision of Tab. Cal.</td><td></td><td></td></tr>
<tr><td>13.3</td><td>Measuring the Weight</td><td></td><td></td></tr>
<tr><td>13.4</td><td>Measuring the blood pressure</td><td></td><td></td></tr>
<tr><td>13.5</td><td>Giving TT Inj.</td><td></td><td></td></tr>
<tr><td>13.6</td><td>Measuring Hb using Haemoglobinometer</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>15</td><td>Were you able to keep in touch with the SC-ANM (in person or by Phone) for getting guidance or sending reports during the lockdown period?</td><td>Yes……...1
No……...2</td><td></td></tr>
<tr><td>16</td><td>Were you able to follow up with high risk pregnant women (through phone call/ visits) during the lockdown?</td><td>Yes……1
No……..2</td><td></td></tr>
<tr><td>17</td><td>Did you receive any training on COVID-19 related infection control practices?</td><td>Yes 1
No . . . . . .2</td><td></td></tr>
<tr><td>18</td><td>Did you receive necessary supplies like masks, sanitizers, personal protective equipment?</td><td>Yes 1
No . . . . . .2</td><td></td></tr>
<tr><td>19</td><td>Were you assigned any COVID-19 –related duty during the lockdown?</td><td>House to House visits for surveillance……...1
Swab collection……2
Monitoring home quarantine....3
None……4
Any other (Explain) _____
_____
_____
_____</td><td></td></tr>
</table>

20	What kind of support could be provided to you in order to continue routine ANC/ PNC checkups? By whom? _____ _____ _____ _____		
21	Was there any maternal death that you know happened during this time?	Yes . . . . . .1 No 2	If the answer is 'No', Thank the participants for their time and close the call
22	In case of Maternal death- - Name of the village/Sub Centre …… - Specify details under the circumstance death occurred _____ _____ _____ _____		

Annexure 4: Questionnaire for VHSNC members

Status of provisioning of maternal health services during the COVID-19 pandemic: A study in two districts of Assam

Questionnaire for VHSNC members

Name of the respondent (Not to be included in data entry): _____

Village: _____

Phone Number(Not to be included in data entry): _____

Date of interview: ____/____/_____ Time of interview: _____ : _____

Name of the interviewer: _____

No	Question	Options	Skip
1	For how many months was the VHSND not conducted due to the lockdown?	SPECIFY_____	
2	Where did the pregnant women in your village go for ANC check-up during the lockdown when VHSNDs did not happen?	To the near by health centre . .1 To private hospital . . . . . 2 ANM/ASHA . . . . . .3 Village Dais . . . . . 4 Any other (Explain) _____ _____ _____ _____	
3	Where did the women in your village go for their delivery during the lockdown?	Home delivery .....1 To the near by health centre . ...2 To private hospital . . . .3 To the ANM/ASHA . . . . . 4 To the Village Dais . . . . . .5 Any other (Explain) _____ _____ _____ _____	

4	Where did the pregnant women in your village go for PNC check up during the lockdown when VHSNDs did not happen?	At Home……..1 To the nearby health centre . ...2 To private hospital . . . .3 To the ANM/ASHA . . . . . 4 To the Village Dais . . . . . .5 Any other (Explain) _____ _____ _____ _____	
5	Did VHSNC play any role in guiding/ helping the pregnant women access the services?	Yes . . . . . .1 No 2	If the answer is 'No', skip to 7
6	If yes, which way?	Provision of vehicle for transport . . . . . 1 Guiding them towards a health facility . . . . . 2 Accompanying them to the health facility . . . . . .3 Talking to the health facility staff for provision of services . . . . . 4 Any other (Explain) _____ _____ _____ _____	
7	Did you receive any training on COVID-19 related infection control practices?	Yes……1 No……2	
8	Was the VHSND organised Post lockdown?	Yes . . . . . .1 No 2	If the answer is 'No', skip to 9
9	If the VHSND was organised after lockdown, was it organised using a "staggered approach[17]" or a "break up session[18]"?	Staggered approach……1 Break up session……2 Regular VHSND……3 Any other (Explain) _____ _____ _____ _____	

10	If no, where are the pregnant women going for ANC?	To the near by health centre . .1 To private hospital . . . . . 2 ANM/ASHA . . . . . .3 Village Dais . . . . . 4 Any other (Explain) _____ _____ _____ _____	
11	Was there any maternal death you know during this time?	Yes . . . . . .1 No 2	
	In case of Maternal death- - Name of the village/Sub Centre …… - Specify details under the circumstance death occurred _____ _____ _____ _____		

17 Staggered Approach: For each session, divide all beneficiaries into hourly slots so that 5-10 beneficiaries are allocated per hour. Alternate Session Sites may be identified in case of space constraints to maintain social distancing.

18 Break Up Session: One village session is divided into two sessions to reduce crowding if staggered approach does not suffice

Annexure 5: Detailed tables

Table 1: Summary of respondents: Pregnant and recently delivered women

Category	Number of responses
Responses from Darrang	50
Responses from Kamrup (R.)	64
Total number of valid responses	**114**
Total number of women who received ANC Darrang (out of total valid responses=50)	49
Total number of women who received ANC Kamrup (R.) (out of total valid responses=64)	61
Total number of women who received ANC (Total)(out of total valid responses=114)	**110**
Total number of deliveries Darrang (out of total valid responses=50)	39
Total number of deliveries Kamrup (R.) (out of total valid responses=64)	36
Total number of deliveries (Total)(out of total valid responses=114)	**75**
Total number of women who received PNC Darrang (out of total deliveries=39)	29
Total number of women who received PNC Kamrup (R.) (out of total deliveries=36)	29
Total number of women who received PNC (Total)(out of total livebirths=63)	**58**

Table 2: Summary of respondents: VHSNC members, Health facility staff and ASHAs

Category	Darrang	Kamrup (R.)	Total
VHSNC members	15	3	18
ASHAs	20	3	23
ANMs	10	3	13
MOs	0	2	2

Annexure 6: About the study partners

SAHAJ (Society for Health Alternatives) is working with children, adolescents and women through direct action in the communities for better access to health and education related services. SAHAJ is also involved in action research and policy advocacy. Currently, SAHAJ has undertaken the project, on 'Evidence based civil society action for gender equality and SDGs'. The project is supported by Equal Measures (EM) 2030. EM 2030 is a partnership convened by ten civil society and private sector organizations with a Secretariat hosted in the UK.

'the ant' is involved in different spectrum of causes like Education, Women Empowerment, Peace and Justice Building Movement and Community Health. The work includes forming women's collectives; providing development and learning opportunities to village children through sports and active science classes; promoting cross-community interactions and nurturing safe spaces for non-violent conflict resolution; promoting livelihoods which are safe and sustainable and establishing a community mental health programme. Apart from its direct work in villages, **the ant** has started a weaving organisation called ***"aagor,"*** which provides work to over 140 women weavers. It runs a training centre for building capacities of other NGOs in the Assam and other Northeast states.

Piramal Swasthya is a registered not for profit organization supported by Piramal Foundation and believes in "Democratizing Healthcare" – making Healthcare Accessible, Affordable and Available to all segments of the population, especially those most vulnerable. In order to achieve this goal, we leverage cutting edge information and communication technologies to cut costs without compromising quality as well as Public Private Partnerships to scale its solutions throughout India. Piramal Swasthya envisions a future in which all vulnerable groups have the necessary information to make informed decisions regarding their health and Accessible, Affordable and Available high quality health infrastructure to support the realisation of those decisions.

Manab Kalyan is a grassroots organisation based in DarrangDistict of Assam which works on socio-economic development of poor communities with a focus on all round development of children. Manab Kalyan has a strong on ground presence with experience of implementing health projects and advocacy with district administration to bring in positive change in the community.

DiYA Foundation is a social organization striving to enhance livelihood and well-being of the deprived and the underprivileged class, particularly those who lack access to resources, services, information and market. It is commited to integral and holistic development in the underserved areas reaching out to all.

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MANAB KALYAN

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