Maternity care provision in five Indian Himalayan sub-centres: barriers and opportunities

Summative Findings Report

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Executive Summary

Background

This report presented the finding of a collaborative research project undertaken by researchers from Northumbria University, Agrani India Foundation and UTSAAH in 2020, funded by the Global Challenge Research Fund.

The project was designed in response to the recognition that women and families residing in rural areas of the Northern Himalayas, India face numerous challenges to accessing high quality maternity care due to difficulties with travel and the availability of services.

Sub-centres provide a range of health services, including maternity care and cover a population of approximately 3000. Indian Public Health Standards (IPHS) were developed in 2007 to act as a benchmark to assess the functionality status of health facilities and to improve the quality of health care delivery. Sub-centres should be staffed by at least one Auxiliary Nurse Midwife (ANM), who is usually supported by a team of accredited social health activists (ASHA). ANMs working within sub-centres provide antenatal, intrapartum and postnatal care, immunization and family planning services. For the purposes of the pilot project discussed in this report, a purposive sample of ANMs supporting five sub-centres in the administrative block of Pati, Champawat District were included in the sample. This area covers a population of 16,000 including 1,755 families.

Primary objective

To assess gaps in maternity care service delivery by the sub-centres, specifically for safe intrapartum and neonatal care with the aim to reduce maternal and neonatal mortality.

Methods

The mixed methods approach included a questionnaire based on the IPHS was designed to determine the functionality of each sub-centre and identify issues in relation to the infrastructure and availability of equipment and medication. Following analysis of the survey data, a semi-structured interview with the five participating ANMs was carried out. This was designed to seek further information about their clinical practice, to explore the attitudes an about their role and to explore gaps in provision highlighted by the survey.

Key Findings

1: Insufficient access to Continuing Professional Development (CPD)

ANMs discussed that there is lack of easily accessible CPD. It is unclear whether the National Health Mission (NHM) is aware of the challenges for ANMs in this area in accessing post-qualification training.

2: Low confidence and competency in clinical skills

ANMs seemed uncertain of their competency to identify and manage and the care of women and neonates experiencing complications that require further treatment or intervention. The areas highlighted by the ANMs were: Safe delivery, new technologies and updates on advancements in maternity care.

3: Need for clinical practice guidelines and protocols

The use of clinical guidelines is variable within sub-centres, although ANMs do not appear to be uncomfortable with the thought of utilising guidelines to support practice. Contextual, evidence-based guidelines could help to standardise practice and offer guidance for ANMs when faced with uncommon and/or emergency clinical situations.

4: Buildings, equipment and consumables requiring improvement

There is evidence to show that the condition of SCs is variable, with some requiring repairs to the building, especially the floors and walls. Some SCs are lacking vital equipment (i.e. functional oxygen cylinders), consumables and medication.

1. Introduction

In October 2019 a Northumbria University, Nursing Midwifery and Healthcare (NMH) research team carried out a scoping visit to Champawat District, a Himalayan region in Uttarakhand in northern India. The visit was hosted by Agrani India Foundation (Agrani India Foundation & Mitra Technology Foundation) and supported by UTSAAH, a registered charity based in the UK that works with NGOs and grassroots organisations in the Himalayas. Within this partnership, UTSAAH provides expert social, cultural and linguistic context and understanding of the proposed project region, as well as pivotal brokering facilitation between all partners.

Agrani India Foundation, in collaboration with Uttarakhand Government, the charitable Tata Trust and local NGOs is working with Indian Government healthcare programmes, to ensure their success within Himalayan communities. This established partnership has identified the most vulnerable population groups: women of reproductive age, children under 2 years and adolescent girls. With the primary objective of understanding the strengths, challenges and gaps in maternal and child health service delivery, the following research activity had been carried out prior to the NMH visit**:** i) baseline survey to investigate the health status of these groups; ii) focus group discussions with local women to understand knowledge, behaviour and cultural practices; iii) discussions with health service providers and peripheral level health workers; iv) health facility assessment including improvement plan for the District Hospital and five government sub-centres in the administrative block of Pati, Champawat District. This area covers a population of 16,000 including 1,755 families.

Northumbria University's NMH Department drew on its action research (Drs Zeb Sattar, Vikki Smith, Cathy Bailey, Professor Susan Carr); midwifery (Dr Vikki Smith); healthcare workforce, community development (Professor Sue Carr, Dr Cathy Bailey) and values-based approach to economic efficiencies (Dr Angela Bate). This team expertise seeks to support strengthening the partnership and its long-term research capability and capacity, the key objectives of the partnership are:

i) Evidencing and prioritising healthcare needs.

ii) Starting from an asset/strength-based premise that works closely with local communities to build trust and confidence in evidence-based healthcare programmes.

iii) To collaboratively design and develop approaches to identify, measure and value the inputs (costs) and outcomes (benefits) of differing local health needs and priorities so that they can be meaningfully compared and evaluated.

iv) Assessing gaps in public /government health care service delivery by the sub-centres, specifically for safe intrapartum and neonatal care with the aim to reduce maternal and neonatal mortality. These would be matched against the IPHS (Indian Public Health Standards).

v) Collecting pilot data on maternity care during a six-month period to highlight the nature of high-risk pregnancies, complications during the perinatal period and common risks to neonates.

vi) Longer term, securing significant funding to develop a Champawat skills centre, a hub for workforce development and potentially, a site for 'placement' visits by Northumbria health and allied health students and professionals, reciprocated by Northumbria and NHS Trust partners hosting Champawat workforce personnel. This has a 5-year development plan, including withdrawal and handover plans and partner MOUs that underpin continued growth and development.

This report details the pilot research and its findings, carried out in 2020 in the Champawat district to address objectives iv) and v) above. As with the 2019 scoping site visit, this research was funded by Global Challenge Research Funding and ethical approvals were sought and granted from Northumbria University. The original design for this pilot research: 'Maternity Care Provision in Indian Himalayan Five Sub-Centres: barriers and opportunities',

was revised in the wake of the Covid-19 global pandemic, so that all data collection at the project site in Champawat was successfully collected virtually or during visits that were approved. The impact of Covid-19 on this pilot research is reflected upon through this report.

Section 2 briefly describes the delivery of healthcare in the region with a focus on maternity care, links to District Hospitals, health care personnel (Auxiliary Nurse Midwife [ANMs] and Accredited Social Health Activist [ASHAs]) and child health care programmes by reviewing a range of statutory and non-statutory instruments that have been translated by District Government and are pivotal to the role of local NGO. Section 2 also provides key highlights from published and grey literature (e.g. Government reports) to consider the evidence.

Section 3 reports on the pilot research, its overall aim, design, sampling, data collection methods and analyses. Section 4 reports on the findings whilst Section 5 identifies key findings and recommendations in relation to Indian maternity care provision from within regulatory, policy and practice frameworks. A conclusion, considering the limitations of the pilot study and the partnership plans to address notable gaps identified through this pilot activity, is presented in Section 6.

2. Context

2.1 Introduction

Fundamental challenges remain in addressing maternal mortality rates in rural areas of India. Historically, maternal mortality figures have reduced at a global level but many South Asian countries including India are falling behind when compared to developed countries (WHO, 2019). Some evidence suggests this is because of weaknesses in the health care system that may influence the access to and use of maternal health care services (Sanneving, 2013) and an estimated 1.25 million babies die before their first birthday (Uttarakhand Health & Family Welfare Society, 2020). According to Kumar and Singh (2015), a contributory factor is the geographic inequalities of health care provision for delivery and postnatal care. A recent study found that only 11.47% of women in Uttarakhand received all of the eight recommended antenatal visits and 31.3% of women received four or more visit (Kumar et al, 2019). The aim of this study is to explore the provision and engagement of

Sub-Centres (SCs) in the Uttarakhand state, with a specific focus on the rural Champawat district.

2.2.Sub-centres in India

Sub-centres are the lowest level of health institution and cover a population of approximately 3000 people in hilly areas. The public health-care infrastructure in rural areas has been developed as a three-tier system in India and sub-centres are first point of call for the population. In 2007, Indian Public Health Standards (IPHS) were developed to aid sub-centres in public health care infrastructure planning; used as a benchmark for assessing the functional status of health facilities and to improve the overall quality of health care delivery in the country. The IPHS are a set of standards that can be tailored to the local needs of an area that are regularly revised to address for policy developments and guidance protocol requires that each sub-centre to be staffed by at least one Auxiliary Nurse Midwife (ANM) female health worker and one male health worker (MPHW (M)) and provision for one additional ANM on a contract basis. In 2005, the National Rural Health Mission (NRHM) also added community health workers (CHWs) or Accredited Social Health Activist (ASHA) (NRHM, 2005) to staff the sub-centres (Chokshi et al 2016). One of the main reasons for introduction of the ASHAs was for them to act as a social change agent at a local village level and to generate the demand for health care services by implementing interventions for behaviour change through awareness and communication among the community (Ministry of Health and Family Welfare, 2017). An ANM at sub-centre level provides antenatal, intrapartum and postnatal care, immunization and family planning services. The Ministry of Health and Family Welfare (MOHFW) also routinely collects surveillance data at the sub-centres, for example, monitoring water quality and health education. Sub-centre staff are also involved in record-keeping and attending review meetings.

Photograph: Paniya Subcentre

2.3 Champawat District and its child and maternal health status

Uttarakhand is located at the foothills of the Himalayan mountain ranges. It is a remote, hilly State and has international borders with China (Tibet) in the north and Nepal in the east. Champawat is a District of Uttarakhand, according to Census 2011; it has 717 villages and four towns with a population of 259,648. The percentage of urban population in the district is 14.77 percent, which is almost half the state average of 30.23 percent. The literacy rate in Champawat district for males is 91% and females is 68%. The lowest rural literacy rate is found in the Champawat block at 78%.

Cultivators (Agriculture) form about 60.25 percent of all workers, which form the highest percentage, while agricultural labourers form 4.05 percent. The catchall category 'Other Workers' form 34.12 percent of the entire working population and includes forms of employment in the secondary and tertiary sector.

Data from the Rural Health Statistics (2019) recorded that there were 68 sub-centres in Champawat, eight Primary Health Centres (PHC) and one Community Health Centres (CHC). The Maternal Mortality Rate is 99 per 100 000 live births in Uttarakhand (SRS 2016-2018). The Infant Mortality Rate is 34 per 1000 in Champawat (Annual Health Survey, 2012-13), compared to 31 per thousand live births in Uttarakhand (SRS 2018).

A summary of key reports and articles, including the latest Indian Government Public Health Standards Guidelines - Sub Centres (IPHS 2012) Uttarakhand Health & Family Welfare Society, the Champawat District Department of Medical Health and Family Welfare website suggests that many premature deaths can be prevented and key recommendations focus on:

- Sub-centres to deliver low cost appropriate medical technology to all pregnant women and children
- Improve efficiency in terms of ensuring universal access to all pregnant women and children to maternal and child health services, reduction in maternal, infant and child mortality with provision of appropriately equipped and resourced sub-centres
- Increase competencies of sub-centre staff for delivery of babies and antenatal and postnatal care for mothers

3. Pilot Research

3.1 Collaborative Research

The pilot project followed the principles of collaborative research. Dr Zeb Sattar, an experienced Northumbria University project manager worked closely with the project site (Champawat, India) Graduate Researcher, Dr Nishigandha. This was to realise collaborative development of data collection strategy, prioritisation of maternity care needs and the on-going co- building of equitable and sustainable, evidence-based research. Dr Nishigandha also provided invaluable interpretation and translation skills, and she and Dr Sattar shared a common language, Hindi. Principal Investigator Dr Vikki Smith and Co-Investigator Dr Cathy Bailey liaised with Dr Sushil Sharma (Agrani) and sought strategic advice from Dr Arun Harish (UTSAAH). Dr Sushil Sharma's long established rural development experience (over 30 years), national and local Government, community and individual network also brought together the views, attitudes, goals and expectations of local communities, NGOs, Government health care workers and others This is pivotal to building trust and confidence in co-producing effective, child and maternal healthcare solutions as well as strengthening what is already working well.

3.2 Research Activities

Due to the Covid-19 outbreak in both the UK and India and in agreement with the project partnership safe and doable remote data collection was planned. In detail:

1. **Review of the existing literature** undertaken to identify evidence relating to the provision of maternity and child health in the five Government sub-centres. Dr Sattar managed this rapid review with input from Dr Nishigandha to ensure that relevant grey literature, including Indian Government reports, strategies, programmes and targets were included. The literature search was conducted using various sources accessed via the Northumbria University Library Catalogue to search subject specific databases that included PUBMED and MEDLINE AND Google Scholar search engine. The key terms used include 'Maternal Health'; 'Sub Centres'; 'Postpartum Health Care'; 'Guidelines Community Health Centres'; 'Maternity in Rural India'; 'Education in health Centres'; 'Skilled Birth Attendants'.

2. **Designing the questionnaire and semi-structured interview** - From the literature review and guided by current Indian Government checklists and surveys of District sub-centres serving the needs of child and maternal health care (Directorate General of Health Services. *Indian Public Health Standards (IPHS) guidelines for primary health centers*. New Delhi: Ministry of Health and Family Welfare, Government of India, 2012), an evaluation questionnaire was designed by the whole team, this to be administered at each of the five sub-centres and to assess gaps in health care service delivery by the sub-centres (Infrastructure; Equipment; Training, Knowledge, Attitude & Practices of Nurses prepared). This survey provided an assessment of the SC infrastructure, equipment, processes and workforce training and highlighted potential actions to improve outcomes. The analysis of the survey data (see point 6 below) and results informed a Topic Guide (see point 5 below). A copy of the survey instrument is appended (Appendix 1) as is an indicative interview Topic Guide (Appendix 2).

3. **Sampling, Recruitment and Consent** The sample was purposive in that each sub-centre is supported by Auxiliary Nursing Midwife (ANM) and they were approached

directly when possible as well as remotely or by phone, to take part. The ANMs are in regular contact with the Agrani/Mitra Foundation; know of its Advisor who is the project clinical lead in India, Dr Sushil Sharma. Dr Sharma regularly visits the sub-centres in person (situated several hours driving from his home base), and with whom, Drs Vikki Smith and Cathy Bailey visited two of the centres during the 2019 scoping visit.

The participant information sheet was translated into Hindi, the commonly spoken language and shared with the ANMs. Giving the ANMs time to consider their involvement (at least 48 hours), the Graduate Researcher followed up with a telephone call to discuss the project further, respond to any questions, ensure that their participation was voluntary and emphasise their rights to withdraw from the study. The consent form and participant documentation was prepared in Hindi to ensure that participants were able to provide informed consent. Dr Nishigandha speaks fluent Hindi and English and supported translation and Dr Sattar has good working knowledge of Hindi. A copy of the participant information sheet and consent form (in English) are attached (please see Appendix 3).

4. **Data Collection 1 -** Once Northumbria ethics approvals had been obtained, and the research team had secured District state, Indian Government permissions, the survey was administered by the Champawat-based researcher to the ANMs supporting the five sub-centres in the administrative block of Pati, Champawat District. This area covers a population of 16,000 including 1,755 families. Where sub-centres were non-functioning, a summary of the facilities and equipment was determined using existing data and local knowledge. The Researcher recorded responses in Hindi and translated into English; the data was then entered into an Excel spread sheet. On completion of the data collection period, the spreadsheet was transferred electronically to the team at Northumbria University. *See Appendix One*

5. **Data Collection 2 -** Following analysis of the survey data, a semi-structured interview with each of the five participating ANMs was carried out. This was designed to seek further information about their clinical practice, to explore the attitudes and opinions

of the ANMs about their role and responsibilities. There was also scope to explore any gaps in provision highlighted by the survey in relation to the infrastructure and availability of equipment and medication. With verbal permission, Dr Nishigandha, audio recorded the telephone interview using a mobile phone, making it clear to the participant that it was for aide-memoir purposes. From this recording, detailed notes were documented in Hindi and the audio recording was subsequently deleted. Due to the challenges of conducting the project remotely and financial constraints, it was impractical to undertake transcription and translation of the interview recordings. The interview schedule was designed to ensure consistency in the interview process and incorporated sufficient detail to support the collection of rich data. Detailed notes taken from the interview audio-recordings were translated into English in preparation for data analyses (see point 6). At this point this qualitative data was anonymised with potential social identifiers removed. *See Appendix Two.*

6. **Data Analysis –** The questionnaire data was analysed using IBM SPSS statistics software. This is a very small sample therefore descriptive statistics were used. The research team aimed to test whether the survey tool, was 'fit for purpose' for use within the specific context – a remote, hilly area that has very challenging access issues and whether it was appropriate for completion by ANMs. Semi-structured interview data were thematically analysed, each in relation to the other. Two members of the research team (VS, CB) independently coded the interview data and then discussed any discrepancies and shared interim themes with the partnership.

3.3 Strengths and Limitations

The findings provide an interesting insight into the experiences of ANMs working in SCs and the effect of the SC environment and the availability of equipment and continuing professional development in relation to the capability of providing high quality maternity care. This builds on previous evidence where the focus has generally been on either the effects of the SC infrastructure or the competency and skills of ANMs/ health workers.

There were substantial challenges encountered during the study period in relation the emergence and spread of the Covid-19 global pandemic. This reduced that capacity for the researcher assistant to travel to sub-centres although some travel was approved to support staff training at the sub-centres. Despite the challenges of working remotely during this time, the successful delivery of the project demonstrates the potential for effective partnership working between international teams and the benefits of incorporating in-depth local knowledge when designing research studies. The collaborative working model ensured that the Graduate Researcher (Dr Nishigandha), based in Champawat, had regular access to support provided by the researcher based at Northumbria University (Dr Zeb Sattar).

The partnership developed between the Northumbria University research team, Dr Sushil Sharma and co-workers and UTSAAH, led by Dr Arun Harish is a significant strength and has ensured that the work undertaken is contextual and provides the foundation for further research and the development of appropriate intervention in the future. This was initiated by the original site visit to the Champawat region by Dr Cathy Bailey and Dr Vikki Smith.

A clear limitation of this study is the small sample size; therefore there is no attempt to make generalisations from the findings although there is the potential to undertake a similar study over a larger geography in the future.

4. Findings

4.1 Overview

The pilot study findings consist of the results from the telephone survey and the findings from the qualitative semi-structured interviews, both carried out with the participating ANMs. This section reports on survey and interview data and offers a brief synthesis of the data as a whole.

4.2 Survey Findings

Table 1 shows the total population served by the sub-centre and the location of the sub-centre in relation to the geographical spread of the population.

The five sub-centres cover a population of between 1050 and 4544 people who live within a specified geographical area and all are located in village settings. There are differences in the distance of sub-centres in relation to the most remotely located families, with some living 35km away and having a journey time of up to four hours to reach the village (table 1). Four of the five SCs were described as being in an easily accessible area.

Table 1 - Sub-centre location and population covered

Sub-centre (SC) study number	Total population covered	Distance to most remotely located family (km)	Travel time for most remotely located family (mins)	Distance from SC to nearest Primary Health Centre (km)	Distance from SC to Community Health Centre (km)
1	2200	35	120	11	42
2	3500	5	90	14	14
3	4544	15	45	50	60
4	4500	29	120	10	45
5	1050	30	240	15	45

The physical infrastructure of the SCs varied, with most requiring some degree of maintenance. All of the buildings were in fair or good repair, however two SCs were reported to have plaster coming off the walls and four out of five required repairs to the floor covering. Cleanliness was described as poor or fair in four SCs and three were located next to a rubbish dump (n=3) or stagnant pool (n=1). Four of the SCs had a regular water and electricity supply, although only one had a back-up generator and none had a landline telephone or transport facilities for staff. Staff residential facilities were not available at any of the participating centres although staff could stay overnight at two of the SCs, if needed.

ANMs led the care from all of the SCs supported by a team of between four and nine ASHAs and a part-time Dai (Traditional Birth Attendant). The ANMs had all received formalised basic training; with two ANMs having completed Basic Health Worker training and three had undertaken Auxiliary Nurse Midwife training. None of the SCs in the study were aligned with a male health worker. ANMs who participated in the study had been qualified between nine

and 33 years and worked between 32 and 72 hours per week, with one ANM reporting that she worked depending on need and the workload.

Table 2 shows the range of services provided at each SC. Unsurprisingly, the SC with the poorest physical infrastructure and minimum amount of ANM support (part-time and based at another SC) provided the least number of services. All of the other SCs provided aspects of maternity care and child health services, although intrapartum care, family planning services and other primary health care were not available at all SCs.

Table 2 - Range of services provided by sub-centres

Sub-centre study number	Antenatal care	Intrapartum care	Approximate number of births per month	Postnatal care (up to 48 hours after birth)	Family planning	Child health	Other primary health care	Immunisation services
1	✓	**X**	0	✓	✓	✓	✓	✓
2	✓	✓	3	✓	**X**	✓	✓	✓
3	✓	✓	8	✓	✓	✓	✓	✓
4	✓	✓	4	✓	✓	✓	**X**	✓
5	**X**	**X**	**0**	**X**	**X**	✓	**X**	**X**

The number of births at each SC per month varied, as shown in Table 2. SCs three and four cover a greater population than the remaining SCs, which partially accounts for the difference in intrapartum care provision. SC five reported never having provided intrapartum care and SC 1 had not provided intrapartum care for the previous eight years. However, a specific challenge in the provision of intrapartum care was the lack of a suitable labour/birth room. Three of the SCs (study numbers: 2,3 and 4) reported having a labour/birth room although the condition of the room was poor in one SC (study number 3), where there was no power supply.

Furthermore, there were deficits in equipment, furniture, consumables and medication availability in all of the SCs. Only one SC (study number 4) had all of the recommended basic neonatal resuscitation equipment and two SCs had less than a third of the required equipment and consumables for a functional SC. Three out of the five SCs had the required number of registers onsite, with the remaining two having eight registers available.

4.3 Interview Findings

Thematic analysis of the semi-structured interviews with the ANMs identified four common themes:

1. Continuing Professional Development
2. Competencies and Confidence
3. Infrastructure issues
4. Structural barriers

4.3.1. Continuing Professional Development (CPD)

Responses to questions about post-qualification (ANM) training and development highlight that there does not appear to be a formal CPD structure, or regulation about mandatory training. Three of the ANMs suggested that they had had “no specific training I have received after completing the diploma for ANM” and “no other training is received”. Two of the ANMs had completed: “Antenatal care, nutrition and family planning” and Basic Health Worker (BHW) training, Skilled Birth Attendant (SBA), Navjaat Suraksha Karyakram (training on basic newborn care and resuscitation) and immunisation’.

When asked about receiving information on CPD opportunities, most had followed up Government notices and advertisements within newspapers and there were also references to support from family: “I got verbal information from a relative and I applied for it.” And “through referral from a relative.” Whilst not explicitly explored, it also seems that the ANMs need to be able to self-fund their own CPD training. All ANMs who participated in the study felt that they would benefit from additional training, with specific reference to:

Safe delivery, new technologies and updates on advancements in maternity care.

Supervision

When asked about supervision of their practice, all ANMs stated that they met regularly with a senior clinician (Health Visitor or Medical Officer in Charge), although the frequency of meetings ranged from once a month to once per year.

4.3.2 Competencies and Confidence

A set of questions explored ANMs individual perception of their competency to identify, and manage and the care of women experiencing a complication or critical presentation that would require further treatment or intervention. This included managing a postpartum haemorrhage, identifying pre-eclampsia/eclampsia, recognition of the appropriate time for transfer to hospital and skills required to perform neonatal resuscitation. The use of clinical guidelines in the SCs was variable; ANMs reported that three of the five participating sub-centres did not have access to guidelines. Only one ANM referred to consulting a clinical guideline when unsure about the best way to provide safe care, although all ANMs described having no difficulty in using guidelines if available.

Three of the five ANMs seemed very uncertain about signs and symptoms of pre-eclampsia/ eclampsia. All five suggested they did not have the relevant drugs to treat this condition and four of the five were unsure at what point they would need to transfer the woman to hospital. All expressed lack of confidence in managing the condition effectively and there was also a suggestion that this was a rare condition within this locality:

> "Basically this terrain doesn't have cases of eclampsia. I have not yet seen such case here in 10 years of my career."

> "I have never attended the case of eclampsia in 33 years of my service".

There were also some gaps in confidence with using a partograph during the intrapartum period and variability in when it would be utilised. In terms of neonatal resuscitation, three of the five sub-centres seem to only have an Ambu bag; another has a mucous extractor with only one SC reported as having an oxygen cylinder for resuscitation purposes, although this cylinder does not open and is hence non-functional

"We only have Ambu bag, no medicines or other equipment are available."

"Not all the drugs and equipments, but Ambu bag, oxygen administration equipment and adrenaline is there."

Three of the participating ANMs suggested that they had competency in dealing with postpartum haemorrhage (PPH), although one of these qualified her affirmation with:

"As I have worked in private hospitals, I can handle the cases. In this set up, we are not allowed to keep the high risks at the sub-centre. Hence we refer the patient ASAP."

Although all ANMs stated that they knew how to safely manage a PPH, their description of the action they would take when faced with this situation differed. None of the ANMs mentioned trying to locate the cause of bleeding.

Finally, responses to a set of questions about supporting breastfeeding and general care of mother/baby following birth, seem to suggest this is where the ANMs feel most confident and display competence, in terms of their knowledge and practice. The ANMs appear to impart what they know with ease. Examples include:

Breastfeeding:

"I promote mother to feed the initial thick milk to the baby, time to time breastfeeding, teach them the correct position, and prepare nipples for the baby to suck. I make sure that the baby is safe while feeding and his nose is not pressed."

Low birth weight baby

"Advice [sic.] frequent breastfeeding, wrap the neonate in warm clothes or according to the weather, monitor the body temperature, I encourage mother to give Kangaroo Mother Care (KMC) to the baby so that it maintains the heat."

Care for Mother and baby immediately after birth

"I look for infection and take all the necessary precautions for infection prevention. Infection shouldn't spread from mother to the baby and from baby to the mother."

There seemed to be a consensus among ANMs regarding care of the neonate immediately after birth. ANMs discussed feeling knowledgeable and confident in knowing when to refer a neonate for specialist care.

‘If the baby doesn’t cry after birth, loose body, less or no any activity, difficulty in breathing, blueness of the skin, coldness of hands and feet are the factors that indicate immediate need of referral.’

4.3.3 Infrastructure Issues

In a hilly and remote area such as Champawat, where the few roads can be impassable at particular times of the year, sub-centre location is important. For these ANMs, geography and terrain is not a barrier to getting to the sub-centre, they seem to live locally. However, one of the ANMs commented that it could be challenging travelling to her workplace:

> “Yeah. Because the terrain is already geographically challenged and there is no easy transport available.”

There are challenges in obtaining suitable transport when the transfer of a woman and/or her baby is required.

> “There is no public transport available. Either private taxi is to be hired or 108 (government ambulance for remotes) is rarely accessible because of bad road conditions.”

Each ANM may be called upon to support another sub-centre should one of their ANM colleagues become ill, although three of the five ANMs suggested that the sub-centre they would cover, is ‘nearby’.

As the ANMs tend to be part of the community served by the sub-centre that they manage, responses to questions about infrastructure, material, human and personal resources, touched on local community, their team members (ASHAs and Dai) and family providing personal resources in terms of resilience and support:

> “Support from my own family, ASHAs in my team help me a lot to work efficiently.”
>
> “Cooperation and trust from the community and family.”

Relatedly, the ANMs also seem to have a clear idea of their role and their population’s needs. When asked about the priorities within target communities in terms of health and wellbeing there seemed a common consensus: a focus on nutrition, hygiene and cleanliness with one ANM including education:

"Nutrition, sanitation, hygiene and general cleanliness in the community."

"Hygiene and Education"

There were also reflections on the need for material and human resources:

> "Working on the resources and building will help to improve the sub-centres. We need medical staff and doctors, especially a female doctor should be there to guide me in high risk cases."

4.3.4 Structural Challenges

When asked about the broader challenges they face, the ANMs noted structural challenges. These included: limited resources; at times, workforce shortages wherein, they would be responsible for two sub-centres; as well as individual concerns about their personal circumstances, such as being an older worker or becoming unwell. That said, one ANM, when asked about what supports her role responded:

"The Department pays attention to my demands, if I need workforce, equipment or drugs or any other kind of help; it is immediately provided to me."

The questions about the role of the Government perhaps could have been better phrased as they yielded little response and it would be interesting to follow up. Similarly, Section 29 (Asset-based approaches), it was clear that these questions need a little more introduction and explanation.

4.3.5 Synthesis of Findings

Both survey and interview data concur that there are some infrastructure and resourcing challenges. These may impede having fully operational and equipped sub centres. Some of the ANMs noted that addressing these issues could ensure that:

"Fully operational health centres will benefit the poorest families, resulting in better health."

And:

"Health care reaches the poor and non- affording mothers of the society."

Survey data revealed that the participating ANMs had all received formalised basic training; with two ANMs having completed Basic Health Worker training and three had undertaken

Auxiliary Nurse Midwife training. Interview data corroborates with some explanation, including that there does not appear to be a formal CPD structure, or regulation about mandatory training. There also seems to be a culture of individual ANMs seeking out CPD opportunities.

Interview data also suggests that ANMs feel most confident and display competence, in terms of their knowledge and practice, in relation to the general care of mother and baby following birth. They suggested having less competence in and confidence with, identifying a potential complications or critical presentations that require clinical intervention. However, this latter was qualified with acknowledgement that some of these emergency and critical presentations, such as eclampsia, are perceived to be rare from within their location.

Key Findings and Recommendations

KEY FINDING 1: Lack of access to Continuing Professional Development (CPD)

Within these five sub-centres in the state of Uttarakhand, ANMS discussed that there is lack of accessible CPD. It is unclear whether the National Health Mission (NHM), an Indian Government body charged with "achievement of universal access to equitable, affordable & quality health care services that are accountable and responsive to people's needs" (see: https://nhm.gov.in/index4.php?lang=1&level=0&linkid=445&lid=38) is aware of the challenges for ANMs in accessing post-qualification training. We understand that the components of the NHM programme include Health System Strengthening, Reproductive-Maternal- Neonatal-Child and Adolescent Health (RMNCH+A), and Communicable and Non-Communicable Diseases. The Agrani research personnel reported that in other states in India that Government funded CPD is readily available for ANMs.

RECOMMENDATIONS

The Agrani Foundation as the lead partner in Uttarakhand and with many years of clinical and wider experience of working with local communities to collectively identify and address their health needs (including child and maternal healthcare), brings this critical gap in sustainable workforce development to the attention of the National Health Mission.

KEY FINDING 2: LACK OF CONFIDENCE and COMPETENCY IN CLINICAL SKILLS

ANMs seemed uncertain of their competency to identify and manage and the care of women and neonates experiencing complications that require further treatment or intervention. The areas highlighted by the ANMs were: Safe delivery, new technologies and updates on advancements in maternity care. Reasons for perceived lack of competency included lack of CPD and knowledge of current practice recommendations.

RECOMMENDATION

To support the provision of existing programmes of CPD, there is the potential for Northumbria University to utilise its simulated clinical skills centre and staff expertise to develop bespoke, online training sessions for ANMs. It is recommended that the ANM training needs (as defined by ANMs), be prioritised to determine the type of CPD that is most needed. An online session will then be co-designed and tested, with consideration of the barriers and facilitators to implementation. This will identify whether training can be successfully delivered using this approach, to determine whether it meets the needs of ANMs and works within the specific context. There will be potential opportunities to involve Northumbria University students in the development and delivery of ANM CPD sessions, which would help to promote sustainability of ANM training and offer new learning opportunities for students.

KEY FINDING 3: LACK OF CLINICAL PRACTICE GUIDELINES AND PROTOCOLS

The use of clinical guidelines is variable within sub-centres, although ANMs do not appear to be uncomfortable with the thought of utilising guidelines to support practice. Contextual, evidence-based guidelines could help to standardise practice and offer guidance for ANMs when faced with uncommon and/or emergency clinical situations.

RECOMMENDATION

An evidence review will be undertaken to explore whether clinical guidelines are used by ANMs in other geographical areas and to ascertain whether there is potential to introduce protocols and guidelines in SCs included in the project. Furthermore, if it is deemed that clinical guidelines could be successfully introduced, a plan will be required to ensure that guidelines are regularly reviewed and updated.

KEY FINDING 4: BUILDINGS, EQUIPMENT AND CONSUMABLES REQUIRING IMPROVEMENT

There is evidence to show that the condition of SCs is variable, with some requiring repairs to the building, especially the floors and walls. Some SCs are lacking vital equipment (i.e. functional oxygen cylinders), consumables and medication. Furthermore, not all SCs have the required number of registers for the recording of outcome data.

RECOMMENDATION

The lack of resources and impact will be demonstrated as an outcome of this report and the team will seek opportunities to share the findings with relevant stakeholders. Alternative means of funding to support improvements in the functionality of the SCs (where needed) will be explored.

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Appendices

Appendix 1 Questionnaire

Question number	**Sub-centre overview**				
1	**I would like to start with some general questions about the sub-centre where you are based.**	**Date of telephone survey**			
2		**Name of the Village**			
3		**Name of the Sub- Centre**			
4		**Total population covered under the Sub - Centre**			
6		**Designation**			
7		**Deliveries conducted at the sub-centre?**			
8		**When was the last delivery conducted?**			
9		**If yes, how many deliveries on average per month?**			
10		**Type of Sub centre**			
11	**Training**	What type of midwifery training did you complete?			

12		Please tell me your highest midwifery qualification?			
13		How many years have you been a qualified ANM?			
14		How many years experience do you have as a skilled birth attendant?			
15		How many hours do you work as a ANM per week?			
	Personnel	**Personnel working from subcentre**	**(yes/no)**	**if yes, number of workers**	**Number of days working per week**
17	**Please could you tell me about the staff that work from the subcentre?**	ANM/Health Worker (Female)			
		Health Worker (Male)			
		ASHAS			
		Staff Nurse (or ANM, if Staff Nurse is not available)			
		Safai-karamchari* (if more than 20 deliveries per month)			
	PHYSICAL INFRASTRUCTURE	**Location**	**Remarks/Suggestion/Identified gaps**		
18	**We would like to understand more about the facilities in which you work.**	**a**. Where is this Sub-Centre located?			

		b. Within village locality/ Far from village locality. If far from locality specify in km			
		c. Whether located at an easily accessible area? (Yes/No)			
		d. the distance (in kms.) of Sub-Centre from the remotest place in the coverage area			
		e. traveltime to reach the Sub-Centre from the remotest place in the coverage area			
		f. the distance (in kms.) of Sub-Centre from the PHC			
		g. the distance (in kms.) of Sub-Centre from the CHC			
		Building			
19		**a.** Is a designated government building available for the Sub-Centre? (Yes/No)			
		b. If there is no designated government building, then where does the Sub-Centre located			
		③ Rented premises			
		③ Other government building			
		③ Any other specify			
20		**d**. What is the present condition of the existing building			

21		**e.** What is the present stage of construction of the building			
			③ Construction complete		
			③ Construction incomplete		
22		**f.** Compound Wall/Fencing (1-All around; 2-Partial; 3- None)			
23		**g.** Ramp for use of trolley/wheel chair users (present/not present)			
24		**h**. Condition of plaster on walls			
			③ Well plastered with plaster intact every where;		
			③ Plaster coming off in some places;		
			③ Plaster coming off in many places or no plaster		
25		**i.** Condition of floor:		Please indicate	
			③ Floor in good condition		
			③ Floor coming off in some places		
			③ Floor coming off in many Places or no proper flooring)		

26		**j**. Whether the cleanliness is Good/Fair/Poor?			
27		**k**. Are any of the following close to the Sub-Centre? (Yes/No)	Yes/No		
		③ Garbage dump			
		③ Cattle shed			
		③ Stagnant pool			
		③ Pollution from industry			
28		Is boundary wall with gate existing?			
29		Prominent display boards in local language			
30		Separate public utilities for males and females			
31		Suggestion/complaint box			
		Labour Room	Yes/No		
32		Labour room available?			

33	**If labour room is present, but deliveries not being conducted there, then what are the reasons for the same?**	③ Staff not staying			
	Please indicate reason from list	③ Poor condition of the labour room			
		③ No power supply in the labour room			
		③ Any other specify			
34		**Is there an examination room available?**			
		Water Supply	**Yes / No**		
35		Source of water (1- Piped; 2- bore well/hand pump/tube well; 3-Well; 4- Other (specify))			
36		**a.** Whether overhead tank and pump exist (Yes/No)			
37		**b.** If overhead tank exist, whether its capacity sufficient? (Yes/No)			
38		**c.** If pump exist, whether it is in working condition? (Yes/No)			
		Waste Disposal			
39		How the medical waste disposed off (please specify)?			
		Electricity/ Communication/Transport	**Yes / No**		

40		a. Regular electric supply available?			
41		b. backup generator/Inverter available?			
42		c. Communication facilities telephone?			
43		d. transport facility for movement of staff?			
		Residential facility for the staff	**Yes / No**		
44		a. Health Worker (Female)			
45		b. Whether Health Worker (Male) available in the Sub-Centre?			
46		c. Is he staying at Sub-Centre Head Quarter village?			
47		d. Staff Nurse			
48		Toilet facilities available?			
	SERVICES	**Service Availability**	**Yes / No**		
49	**Do you do any of the following: ANC, child birth, PNC, family planning, child health, other primary health care?**	a. Ante-natal care			
		b. Intranatal care			

		c. Post-natal care (up to 48 hours after birth)			
		Family planning			
		Child health			
		Other primary health care?			
50		e. Is the Antenatal care (Inj. t.t, IFA tablets, weight and bP check up) provided by those in the Sub-centre?			
51		f. Are the facilities of Haemoglobin testing, urine testing for protein and sugar and urine test for pregnancy available?			
52		g. Is the facility for referral of complicated cases of pregnancy/delivery available at Sub-centre for 24 hours?			
53		h. Does the ANM/ASHA/any trained personnel accompany the woman in labour to the referred care facility at the time of referral?			
54		i. Are the Immunization services as per Government schedule provided by the Sub-centre			

	Equipment		Available	Functional	Remarks/Suggestion/Identified gaps
55	**Is the following equipment avaliable and working in the sub-centre?**	Torch ordinary			
		Flashlight/torch box-type pre-focused (4 cell)			
		Dressing drum with cover 0.945 litrs stainless steel			
		Haemoglobinometer - set Sahli type complete			
		Weighing scale adult 125 kg/280 lb			
		Weighing scale infant 10 kg			
		Weighing scale(baby) hanging type 5kg			
		Sterilizer			
		Surgical scissors straight 140mm			
		Sphygmomanometer 300mm aneroid and cuff			
		Kelly's hemostat Forceps straight 140 mm ss			
		Vulsellum uterine Forceps curved 25.5 cm			

		Cusco's/Graves Speculum vaginal bi-valve medium			
		Sims retractor/depressor			
		Sims Speculum vaginal double ended			
		uterine Sound Graduated			
		Cheatle's Forcep			
		Vaccine Carrier			
		ice pack box			
		sponnge holder			
		plain forcep			
		toothed forcep			
		needle holder			
		suture needle straight			
		suture needle curved			
		kidney tray			

		Artery Forceps, straight, 160mm Stainless steel			
		dressing forceps (spring type), 160 mm stainless steel			
		Cord cutting Scissors, blunt, curved on flat, 160 mm ss			
		Clinical thermometer oral & rectal			
		talquist Hb scale			
		stethoscope			
		foetoscope			
		Hub Cutter and Needle Destroyer			
		Ambu bag(Paediatric size) with baby mask			
		suction machine			
		oxygen administration equipment			
		tracking bag and tickler box (Immunization)			
		measuring tape			
		iv stand			

56	**Are the following consumable supplies available?**	**Consumable**	**Available**	**Functional**	**Remarks/Suggestion/Identified gaps**
		Syringe (10 cc, 5 cc, 2 cc) and AD Syringes (0.5 ml and 0.1 ml) for immunization			
		Disposable gloves			
		Mucus extractor			
		Disposable Cord clamp			
		Disposable Sterile urethral Catheter (rubber plain 12 fr)			
		folley's catheter adult			
		Dipsticks for urine test for protein and sugar			
		Dry cell/battery			
		urine pregnancy test kits			
		Disposable lancet (pricking needle)			
		Disposable sterile swabs			
		Glass slide box of 25 slides			
		routine immunization monitoring charts			

		blank immunization cards/jointy MCH card (1 per pregnant mother) & tally sheets (1 per immunization session)			
		Whole blood Finger Prick HIV Rapid test and StI Screening test each			
		Reagents such as Hydrochloric acid, acetic acid, benedict's solution, bleaching powder, Hypochlorite solution, Methylated spirit etc.			
		Partograph charts			
		Cleaning material, detergent			
		Specimen collection bottles			
		IV canula & intravenous set			
		200 watt bulb			
		black disposal bags			
		Yellow disposal bag			
		red disposal bags			

		Equipments for newborn care corner (Only for Type B Sub-Centres)	Available	Functional	Remarks/Suggestion/Identified gaps
		Open care system: radiant warmer, fixed height, with trolley, drawers, O2-bottles			
		Resuscitator (silicone resuscitation bag and mask with reservoir) hand-operated, neonate, 500 m			
		Weighing Scale, spring			
		Pump suction, foot operated			
		thermometer, clinical, digital, 32-34 0C			
		Light examination, mobile, 220-12 V			
		Hub Cutter, syringe			
		Intra Venous Cannula 24 G, 26 G			
		Extractor, mucus, 20 ml,			
		tube, feeding, CH07, L40cm,ster,disp			
		Oxygen catheter 8 F, Oxygen Cylinder			
		sterile gloves			

	DRUGS	**Yes / No**			-
57	**Are all of the recommended drugs available in the sub-centre?**				-
58	**If no, please indicate which drugs are missing or in short supply.**	**Kit -A**	**Unavailable**	**Remarks/Suggestion/Identified gaps**	
		Oral Rehydration Salts IP			
		Iron & Folic Acid tablets (IFA) – large			
		Folic Acid tablets IP			
		Iron & Folic Acid tablets (IFA) – small			
		trimethoprim & Sulphamethoxazole tablets IP (Pediatric)			
		GV Crystals (Methylrosanilinium Chloride bP)			
		Zinc Sulphate Dispersible tablets uSP			
		Iron & Folic Acid Syrup			
		Water – Miscible Vitamin Concentrate IP (Vitamin A Syrup)			
		Kit- B	**Unavailable**	**Remarks/Suggestion/Identified gaps**	

		Methylergometrine tablets IP			-
		Paracetamol tablets IP			-
		Methylergometrine Injection IP			
		Albendazole tablets IP			
		Dicyclomine tablets IP			
		Chloramphenicol Eye Ointment IP			
		Povidone Iodine Ointment uSP			
		Cotton bandage (As per Schedule F II)			
		Absorbent Cotton IP			
		Desirable (For Type B Sub - centres)	**Unavailable**	**Remarks/Suggestion/Identified gaps**	
		Inj. Gentamycin			
		Inj. Magnesium Sulphate			
		Inj. Oxytocin			
		Cap. Ampicillim			

		Tab. Metronidazole			
		Tab. Misoprostol 200 mg			
	Furnitures	**Lists of Furnitures**	Available	**Functional**	**Remarks/Suggestion/Identified gaps**
59	**Is the following furniture present in the sub-centre?**	Examination table			
		footstep			
		table			
		table for immunization			
		chairs			
		medicine chest			
		almirah			
		bench for waiting area			
		stools			
		labour table*			
		beds with matresses*			

		screen			
		lamp			
		clock			
		fans			
		tubelight			
	SUNDRY ARTICLES	**List of articles**	Available	**Functional**	**Remarks/Suggestion/Identified gaps**
60	**Are the following article available in the sub-centre?**	buckets			
		mugs			
		kerosene stoves			
		sauce pan with lid			
		water jug			
		dustbin with the lid			
		rubber/ plastic sheets			
		drum with tap for storing water			

		waste disposal twin bucket for hypoclorite solution/ bleach			
		disposable jar			
		generator facility*			
		computer*			
		refrigerator*			
		room heater/cooler			
	** For Type B Sub- centres only*				
	RECORD AND REPORT	**Registers Available**	**Yes / No**		
61	**Please tell me whether you use the following registers?**	2. Maternal and Child Health Register:			
		a. Antenatal, intra-natal, postnatal			
		b. under-five register:			
		i. Immunization			
		d. Number of HIV/STI screening and referral			
		3. Births and Deaths Register			

		4. Drug Register			
		5. Equipment Furniture and other accessories Register			
		8. Register for records pertaining to Janani Suraksha Yojana.			
		9. Register for maintenance of accounts including untied funds.			

Appendix 2 Topic guide

What type of training did you complete?
Please tell me your highest qualification?
How many years have you been a qualified ANM?
How many years experience do you have as a skilled birth attendant?
Please tell me how you currently access training?
What types of training have you completed since you qualified?
How did you access training?
Please tell me about any specific training that would be helpful for you in your role?
How many hours do you work as an AMN per week?
How is your work covered if you are off sick or take time off?
How far do you live from the sub-centre?
How long does it take you to get there?
Can you stay overnight at the sub-centre?
If you can stay, are the facilities comfortable?
Do you work with other health workers?
Please tell me about the team you work with.
How oftern does your team meet to discuss work?
Are there good transport services if you need to transfer women to hospital?
Please explain how the tranfer arranagements are made.
Do you have guidelines to support your practice?
Please tell me about the guidelines that you use, are they always helpful/ easy to follow?
What are the difficulties that you have in following guidelines?
List of guidelines currently used
Do you or the ASHAs in your team encourage women to make individual birth plans?
What do IBP include?
What are the warning signs that you ask women to look out for during pregnancy?
What are the signs that you look for if you think a woman has pre-eclampsia/ eclampsia?
Do you have all of the euipment and drugs that you need to treat pre eclampsia/eclampsia?
At which point would you arranage transfer to the hospital?
How confident do you feel about managing an eclamptic fit?

Do you encourage partners to stay during labour and birth?
Are you confident about using a partograph during labour?
How often do you use a partograph?
How often do you perform a vaginal examination during labour?
What is you advice to women if labour is progressing normally?
When did you last receive training on neonatal resusitation techniques?
When did you last receive training on obstetric emergencies?
Please tell me about any training received.
Do you have all of the equipment/ drugs needed to undertake neonatal resusitation?
At which point would you arranage transfer to the hospital?
Please explain how you manage the third stage of labour (delivery of the placenta)?
What do you do if you have problems delivering the placenta?
Do you feel well prepared to manange a postpartum haemorrhage (PPH)?
What steps do you take if a woman bleeds heavily after birth?
Do you have all of the equipment/drugs available to manage PPH?
What would promt you to arrange transfer in this situation?
How do you support a mother to breastfeed immediately after birth?
How do you care for a baby that is growth restricted/ low birth weight?
Please tell me about the care that you provide to mothers and babies after birth.
How long are women encouraged to stay in the sub-centre after birth?
Are there facilitites for family memebers to stay after the birth, if so please tell me about the facilities.
What are the challenges that you face in your role?
What helps you to perform your role effectively?