Assessing the impact of COVID-19 on maternity services in Malawi

Preliminary findings from a rapid qualitative study

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Contents

Executive summary

Background

The first case of COVID-19 in Malawi was reported on 2nd April 2020. This report details accounts of the *early impacts* of COVID-19 on women and healthcare professionals engaged in maternity services elicted by semi-structured interviews conducted 2nd to 14th July 2020.

Views from healthcare providers looking after pregnant women on the changes that have been made in health service delivery and their working environment during the pandemic.

(At that point) many healthcare providers reported not having received training in COVID-19. Lack or shortages of PPE were reported. Changes in clinic operations (split teams, cap on daily client numbers, closures in waiting homes and stoppage of post-natal check-ups) were considered to be impacting negatively on access to services.

Views on future practice

PPE provision needs to improve and should be carried forward into post-COVID practice. Hygiene and social distancing measures were positive developments that would have benefit post-COVID. The quota on patient numbers at clinic should end. Post-natal check-ups should resume to prevent avoidable post-natal complications. However, some nurses noted that reducing numbers at the clinic had in some instances enabled them to work more efficiently with their patients and in a more targeted manner.

Views from currently or recently pregnant women about changes that have been made in their antenatal care, birth plans and health seeking behaviours during the pandemic.

View on antenatal clinics: Some women were sent home without being seen. The journey was perceived as risky and tiring. Reduced service was reported e.g. limited testing, scanning and examination. Specialist advice was hard to access.

Views on birth: In some facilities labour procedures were adapted, numbers of guardians and visitors were limited, the woman:midwife ratio was affected by quarantining staff and closure of other facilities due to COVID-19 cases.

Views on future care

Women were keen to see an end to the practice of sending women back from clinic – proposal that clinics should expand their opening times. More washing facilities an mandatory mask wearing was requested. There was support for the continuation of the heightened hygiene measures. Some voiced support for the continuation of patient quotas attending clinic to enable better care.

Summary

COVID-19 has been very disruptive to maternity services. Capacities have been limited. Services were re-configured in ways which unsettle both care providers and users. COVID-19 prevention measures have been put in place, but not always achieved.

COVID-19 has brought significant anxiety to both women and staff. Staff want more training and PPE. Women want to be seen and not to be sent home. Increased hygiene practices praised by both staff and women. Further evaluation of the impact of the Malawi Ministry of Health COVID-19 guidelines for Maternal and Newborn Health Services introduced in June 2020 is needed.

Introduction

COVID-19: origins, nature and prevention

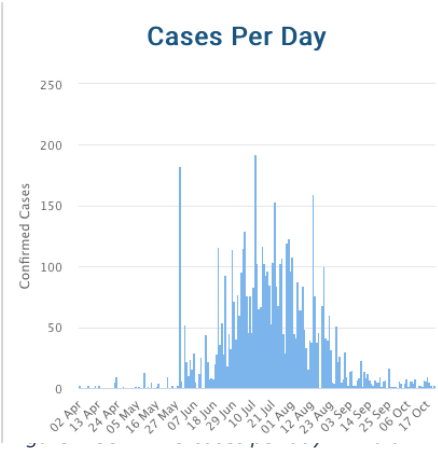
During December 2019, a novel coronavirus was identified in Wuhan City, China and given the name SARS-CoV-2. The virus spread rapidly and was declared pandemic on 11th March 2020 by the World Health Organization (WHO). Transmission of SARS-CoV-2 is most common via small droplets emitted from the respiratory system which are encountered via close contact with an infected person or with a surface on which droplets are present.

SARS-CoV-2 causes an infectious disease known as 'COVID-19' which is characterised by fever, coughing, shortness of breath and loss of smell. Serious complications include pneumonia and acute respiratory distress syndrome. As of 3rd August 2020, the WHO reported that the pandemic has produced 17.9 million confirmed cases of COVID-19 and 686,703 deaths.

With no vaccine or treatment currently available for COVID-19, public health approaches to prevention have been the focus of the response to the pandemic. Worldwide, governments and health authorities have variously encouraged their populations to wash hands thoroughly and regularly, to maintain physical distance from people outside of one's household, to catch coughs and sneezes in the elbow, to wear masks and to avoid travel. In some territories, 'lockdown' measures have been instigated. Contact tracing and isolation have also been used by some authorities to good effect and has also been positioned as an essential measure by the WHO. Finally, those who display symptoms are required to isolate themselves from contact with others.

COVID-19 in Malawi

Malawi recorded its first cases of COVID-19 on 2nd April 2020. Since then, confirmed cases have risen to 5,864 (as at 22/10/20) with 183 deaths and 4,765 recoveries. The distribution of cases per day since first recorded case in Malawi can be found in Figure 1.[1]



Government response to COVID-19 in Malawi has included a range of measures to limit the spread of the virus. Schools and educational institutions have been closed, gatherings of more than 100 people have been banned, Malawi's borders have been closed to those without citizenship or residency, and some prisoners have been released early. A full 'lockdown' was proposed, but blocked by the courts on the grounds that it was likely to do more harm to public health than good.

Alongside these structural measures, the Malawian government has encouraged the full range of behaviour-based prevention measures. Hand hygiene, masks, physical distancing and catching coughs and sneezes in the elbow have all been promoted.

[1] Data acquired from Malawi's Ministry of Health via: https://covid19.health.gov.mw (accessed on 22-10-20)

COVID-19 and maternal health

The available data of the impact of COVID-19 on pregnancy is limited and rapidly evolving. Initial data suggested that women may not be more likely to contract COVID-19 but emerging data suggests that some women may be more susceptible to severe disease. Some series have reported increased preterm birth and stillbirth among women with COVID-19, but no causal link has been established.[2]

In view of these observations and knowledge of impact of other coronaviruses on pregnancy, clinicians still consider pregnant women to be vulnerable to COVID-19, as they face increased risks from any form of respiratory disease due to reduced lung function, increased oxygen demand and altered immunity and are more susceptible to thrombotic events.

In Malawi, the Ministry of Health released *Guidelines for Maternal and Newborn Health Services Including Family Planning During the COVID-19 Pandemic* at the end of June 2020.[3] This document set out a range of measures to protect women, babies and healthcare professionals who attend maternal and newborn health (MNH) services during the COVID-19 pandemic. These include:

- Follow a detailed infection prevention and control plan in MNH services
- Use personal protective equipment (both clinicians and patients)
- Screening and triage for COVID-19 of all women attending MNH services
- Social distancing of 1-1.5m enforced throughout MNH services
- Hand washing stations provided throughout MNH services
- Limiting number of antenatal care (ANC) appointments per clinic to promote physical distancing in waiting areas
- Increase number of ANC clinic days or extend opening hours
- Integrate components of care to limit repeat visits (e.g. combining scans, blood tests and vaccines in a single visit)
- Ask women to bring their own cup to use when taking medicines

While not exhaustive, this list outlines some of the key measures set out in the Ministry of Health's *Guidelines*. Included in these guidelines are a series of detailed operating procedures and algorithms relating to infection prevention and control, and defining and managing COVID-19 cases during antenatal and postnatal care.

Study objectives

While data collection for the present study took place in the two weeks that followed the release of the Ministry of Health's *Guidelines*, it is not an evaluation of their implementation. Rather, our study had the general objective of understanding the early

[2] Wastnedge, E.A., Reynolds, R.M., van Boeckel, S.R., Stock, S.J., Denison, F., Maybin, J.A. and Critchley, H.O., 2020. Pregnancy and COVID-19. *Physiological reviews*.

[3] Ministry of Health Malawi, (2020). *Guidelines for Maternal and Newborn Health Services Including Family Planning During the COVID-19 Pandemic*. Lilongwe: Malawi Government

impact of Covid-19 on maternity services in both rural and urban Malawi. This objective was broken into 4 specific objectives:

1. To find out whether pregnant women and service users have been reached with COVID-19 information, and whether they are able to comply with government advice.
2. To acquire views from health care providers looking after pregnant women on the changes that have been made in health service delivery and their working environment during the COVID-19 pandemic.
3. To gain views from women who are currently or recently pregnant about changes that have been made in their antenatal care, birth plans and health seeking behaviours during the COVID-19 pandemic.
4. To understand whether health needs of pregnant women are being met during the COVID-19 pandemic.

In this report, we present our preliminary findings in relation to the first three objectives. In the concluding section we begin to address the fourth objective and consider recommendations that have potential to address unmet needs.

Study Design

The study used semi-structured interviews to collect accounts of the early impact of COVID-19 on pregnant women, women who recently delivered and healthcare professionals working in maternity services. A breakdown of the topic guides used in the interviews can be found in Appendices A and B.

Study sites

The study was conducted in six maternity services: Chilumba (Northern Region), Area 25 Lilongwe (Central Region) and Chileka, Zingwangwa, Limbe and Bangwe (Southern Region). These clinics were selected due to their participation in the DIPLOMATIC partnership, which is carrying out research focussed on reducing preterm and stillbirth in Malawi and Zambia. This pre-existing research partnership facilitated rapid access to pregnant women and health care professionals whose activities have been affected by the novel coronavirus pandemic.

Study sample

Our research team interviewed 18 women and 12 health care professionals from across the six maternity clinics included in this study.

Of the 18 women, 14 were pregnant and currently under the care of one of the six participating clinics and 4 had recently given birth. The women we spoke with had an average age of 29.8 (range: 18-38). Figure 2 depicts self-described occupations of the women and figure 3 the duration of their pregnancies at the time of interview.

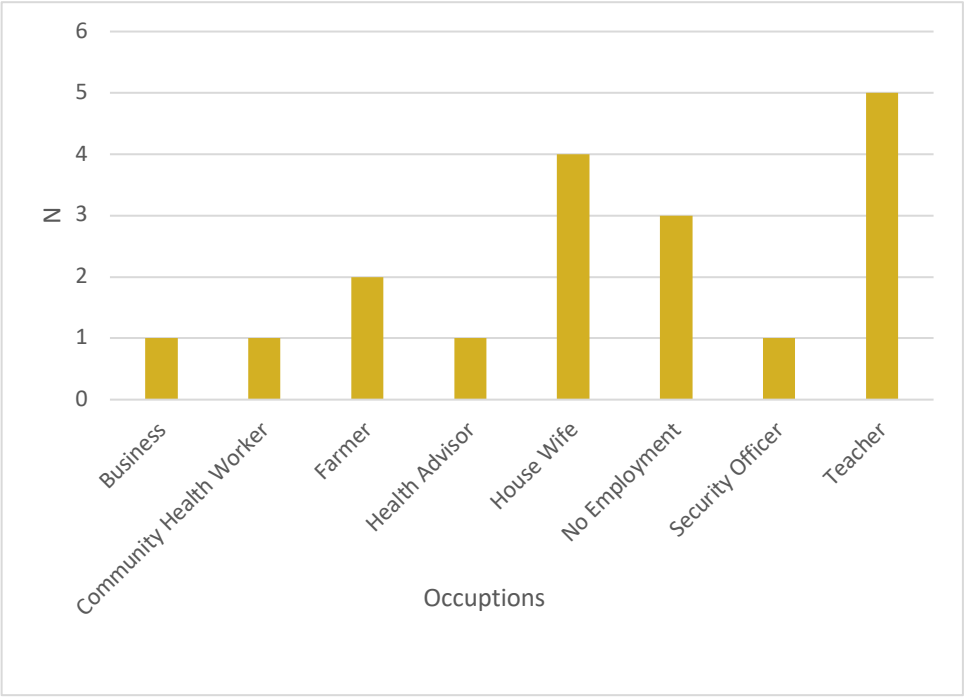


Figure 2 Self-described occupations of pregnant or recently delivered women interviewed in this study

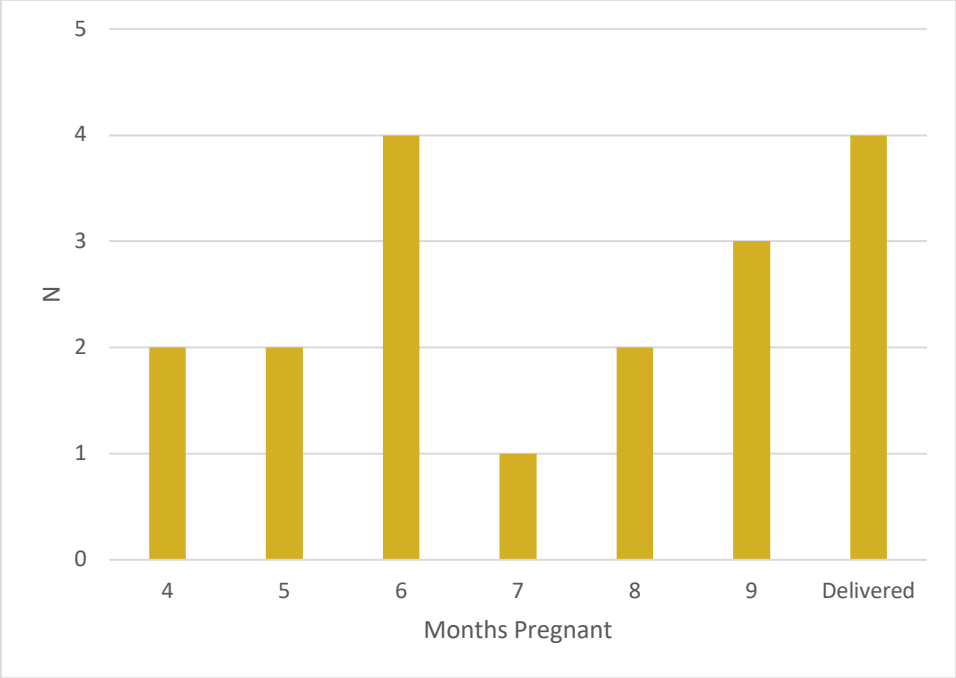


Figure 3 Stage of pregnancy of women interviewed in this study

The 12 healthcare professionals that we spoke to were all women, had an average age of 33 (range: 24-40) and all were nurses specialised in midwifery. The average years of service in this group of nurses was 9.4 years, with a range of 3-21 years.

Data collection and management

Interviews were conducted by a team of interviewers trained to work remotely by using telephones to carry out the interviews and tablets to record them. Audio recordings were encrypted and transferred securely for anonymisation, transcription and translation into English. Data collection began on 2nd July 2020 and was completed on 14th July 2020.

Data analysis

The findings presented in this report were generated by a team of 3 researchers using a thematic analysis approach.[4] This approach is made up of 6 phases:

1. Familiarisation with the data
2. Coding
3. Searching for themes
4. Reviewing themes
5. Defining and naming themes
6. Writing the report

[4] Braun, V. and Clarke, V., 2006. Using thematic analysis in psychology. Qualitative research in psychology, 3(2), pp.77-101.

Given the rapid nature of the research and the need to provide timely insights into the situation on the ground in maternity services, the findings we present here are derived from an expedited movement from stages 3-6. Consequently, the 'themes' under which we have organised and presented the data are not final. The content of our findings, however, is unlikely to change substantially.

All analysis was conducted using NVivo 11 software to enable systematic organisation, searching, categorisation and recall of data.

Ethics

Ethical approval for this study was granted by the College of Medicine Research Ethics Committee on 5th June 2020 (reference: P.05/20/3048). An informed consent procedure was administered over the telephone before interviews commenced, and all participants gave oral consent to participate in the study.

Study Findings

COVID-19 knowledge and prevention practice

The pregnant and recently delivered women we spoke to provided us with a wide range of accounts of COVID-19. Some relayed detailed accounts of the symptoms of the virus, how it is transmitted, how to prevent it and who is most at risk. Others offered more limited accounts focused on symptoms or preventative measures.

In relation to the prevention practices that our sample were engaged in, we also found that a range of activities were reported. Some displayed great caution and went to significant lengths to limit their potential for exposure to COVID-19, while others faced challenges that prevented them from taking steps to limit exposure or were less concerned by exposure.

Knowing COVID-19

Under the theme 'Knowing COVID-19' we present data relating to how our sample of pregnant and recently delivered women spoke about COVID-19, its symptoms and prevention.

The majority of the women we spoke to were aware that COVID-19 is an infectious disease. The use of terms commonly used in the description of HIV is significant, especially the transmission through "bodily fluids". For example, one woman offered the following account:

> Covid-19 is a disease that is caused by a coronavirus. This virus is transmitted through bodily fluids that are released through coughing and can enter the body of another person through mouth, nose and eyes. In that way, it means transmission has been done. [ABW2]

Another participant described what she knew of COVID-19:

> I know that Covid-19 is a disease that is transmitted through air or body fluids like saliva, sweat, mucus. It's a disease that is killing people in an agonized way. It's a disease that we can prevent by mostly following hygienic practices. [MDW2]

In contrast to accounts such as these two, some women provided more limited accounts of COVID-19. For example, when asked about their knowledge of COVID-19, one woman replied 'I don't know anything' [DBW1]. Another woman offered the same response [LMW3]. However, when probed, both of these women spoke about symptoms or prevention strategies that they had heard about:

> They say its high body temperature (uhumm), headache (uhumm), shortness of breath (uhumm), eeeh flu (uhumm)… The preventing measures are that you are supposed to put on a mask when going out, don't use your palms when coughing. [LMW3]

Elaborated accounts of symptoms and prevention were also offered by women. For example, this interviewee from Limbe:

> P: We need to wash hands regularly so that we shouldn't get the virus from our friends. If we are travelling in a minibus and we touch a seat and thereafter touch our eyes or nose or mouth, we can be infected with the virus, if that seat was previously touched by a person having Covid-19.
> **I: Do you know other ways of prevention apart from washing hands?**
> P: We can also protect ourselves by wearing masks and observing a social distance of 1 metre. The most important preventive measure is to avoid movements by just staying at home, in that way we can be protected from many things.
> **I: Do you know any symptoms that a person with Covid-19 has?**
> P: Yes, its symptoms are coughing, fever, headache, general body pains that can make a person feel like is having malaria, sore throat, difficulties in breathing, sometimes chest pains. They also say that a person with Covid-19 lack sense of smell. [DHW2]

Alongside understandings of COVID-19's symptoms, transmission and prevention, some of the women we spoke to offered accounts that mentioned groups of people that are most vulnerable to infection. For example:

> Everyone can be infected with Covid 19 but there are some people who are at higher risk of being infected, these people can easily get infected. Examples of people at risk of being infected by Covid 19 are us pregnant women, people on ART, people suffering from Diabetes, TB and other diseases. [ZAW1]

Across the sample, women told us that they learnt what they knew about COVID-19 from the radio, maternity clinics, church, or from an NGO. Radio was the most common source of information mentioned.

While not all of the women we spoke to were able to provide detailed accounts of COVID-19, all displayed some degree of awareness of COVID-19 as an infectious disease. Some women used descriptive terms which are also used to describe HIV transmission. Across our sample, basic knowledge of the need for handwashing and social distancing was consistently present in accounts, and many were able to offer more elaborate descriptions relating to masks, limiting movement and catching coughs and sneezes. Some women knew that, as pregnant women, they are more vulnerable to COVID-19 and named other vulnerable groups.

Practising COVID-19 prevention

In this section we gather together data relating to the practical steps women in our sample took to avoid contracting COVID-19, using the theme title 'Following COVID-19 Advice.

When asked about the measures they are taking to limit their exposure to COVID-19, the majority of our sample spoke about hand washing and physical distancing. For example:

> The changes which I have made at home include; washing my hands with soap regularly, and after visiting the toilet I also wash my hands and not just after the toilet but I wash my hands after every 20 minutes with soap, I sit at a distance from my friends which is 1 metre apart whenever I am among a group of people and I avoid to be among many people but only on places where there are few people between 5-6 people but not 100 people or above and I follow social distance. [KMW3]

However, following guidance to wash hands with soap regularly was not without challenges for some. One woman from Lilongwe described facing financial difficulties and problems accessing soap:

> There are challenges because at present I depend on my husband who look for money to support the family but as I already said that with this disease he finds it difficult to earn a living and it's hard to get food. And at home, they advise us to use soap frequently but it's hard to find it. [DXW2]

Approaches to social distancing were also varied, with some keeping distance and avoiding large gatherings, as described by BGW3 above, while others described a more concerted effort to limit their movements. For example:

> We have also reduced mobility, we have reduced any unnecessary movements. We only move around when we want to do a beneficial thing like going to hospital, church and other places. Schools have temporarily been closed so as teachers we are just staying at home. So that's the only change, I have reduced mobility and I have also told my children not to move around, they should just stay at home. [BCW1]

While not common, some of the women in our sample spoke about wearing masks. For example, one woman described how her whole family use them:

> The major thing I did was the hand washing facility and everybody at my household has masks. We wear them when we go on a trip everywhere. [VMW3]

Another described how wearing a mask caused her difficulties:

> I was having difficulties in breathing [shortness of breath] so I wasn't wearing masks. So for this reason, I stopped going to work. My fear was that if I kept on working without wearing mask, I would have contracted corona virus, considering that I was already at high risk due to my condition, so I was just staying at home. [PUW3]

Across the sample, women commonly described washing hands regularly and various approaches to maintaining physical distance from others. Some also spoke about general attempts to limit their movements and the movements of their household members. A minority spoke about wearing masks. Challenges to following preventative measures include accessing soap and difficulties breathing when wearing a mask.

Healthcare professional accounts of changes to care

In this section we present nurse/midwife accounts of how their services have changed in response to COVID-19. We begin by exploring the training and guidance they have received before looking at the specific practical changes to service operation. After this we present their views on future practice – what should be maintained and what needs to change.

Training and guidance

Across the sample, we found that some service staff reported receiving training on COVID-19, while others did not. For example:

> "Yes, we had a three-day training about this at [location] Health Centre." [XSN1]

> "Yes, we underwent training on Covid-19 which was organized by Organizations that support us." [BYN1]

> "No, we have never been trained." [JMN1]

> "No, I haven't undergone any training about Covid-19. We were told that they will come to train us, but they haven't come up to date." [WMN1]

Those that did not receive training often expressed their desire to be trained in strong terms. For example:

> The major issue is about health workers, they should train us. We are doing things depending on the little knowledge that we have. We should be offered Covid-19 lessons and this can help to address some of the questions that we do have, but at the moment we are just like a sheep that has been tied. [JMN1]

Another nurse explained that the COVID-19 information they are working with comes from general public information sources:

> Firstly, we are working but we are not trained on Covid-19, if we are getting the information we get it through TV's, radios and other posters which people put in other places but we are not trained on the real meaning of Covid-19 and how we can manage it in a hospital environment. We do some of the things depending on our little information but we are not trained. Maybe there are some providers who were trained but they can be just the two people who are working in isolation wards and they are the only ones who are trained but the majority or the front liners are not trained. So the first thing that I would suggest is training; they should train us to have the right knowledge of what we are facing. [SBN2]

While some nurse/midwives have received training, many reported that they have not. Where training has been received, some reported incomplete coverage. Information on COVID-19 is often derived from public sources. Training is considered a priority by those who have not received it.

Hygiene and protective measures adopted in clinics

Nurse/midwives spoke of a range of preventative measures that have been adopted in clinics to limit the spread of COVID-19. In this section we describe prevention measures focussed on hygiene practices that have been implemented.

Two key hygiene-related measures that nurse/midwives spoke of were hand washing and wearing a mask during work:

> Changes that we have made are that when health workers arrive at the hospital they are supposed to wash hands with soap at the sink. There is always soap at the sink which we use for washing hands thoroughly. From there, we are supposed to find masks and make sure that at the clinic where each one of us work, patients are observing social distance. [EPN2]

Some also spoke of having access to aprons, footwear and hand sanitiser. However, it was common for nurses to report that either they lacked personal protective equipment (PPE) or that it was insufficient. For example:

> Most of us (health workers) at the clinic don't have masks. In case the health worker is sick, coughing and sneezing, it means they can get the disease from you. As a health worker I am supposed to put on a mask. During antenatal clinic, we are supposed to use hand sanitizer wrap when examining pregnant women but most of the time we don't have the sanitizer and we also don't manage to go wash hands before and after touching every patient, so in these ways we can transmit the disease to women. [RBN1]

As well as leaving nurse/midwives unprotected, shortages of PPE were described as having a direct impact on the type of care that they offer to women:

> In relation to my daily routine work, resources like masks are not readily available for me to use when I want to take care of a client so sometimes I don't deliver the intended services for fear of contracting the disease as we are aware that we don't know who is having this disease. We treat everyone as if is already having the disease. [BWN3]

Clinics commonly adopt hand washing and masks to protect staff and patients. Some have access to hand sanitiser, protective footwear and aprons. Others reported lack of or shortages of PPE. Where PPE is lacking it can have a direct impact on the services offered by nurse/midwives.

Changes to the operation of clinics

Nurse/midwives described a range of operational changes implemented in their clinics. Staffing numbers, appointment availability and services have all changed.

One of the operational changes described by nurse/midwives was the division of staff into teams that work on separate days. This has been put in place to ensure that if one team is

exposed to a confirmed case of COVID-19, the second team remains unexposed. The effect of this is described here:

> Yes, the total number of nurses and midwives at our hospital is 20. In the past, we were all working at the same time, but as of now they have divided us into two equal teams which is 10 for each team. This has made the number of women who seek care to be large against the few health workers assisting them. This has also affected the quality of our work because many pregnant women are assisted by one nurse. [RBN1]

One of the consequences of dividing maternity service staff into two teams is that there are fewer staff members at each clinic. This impacts the staff to patient ratio and, as RBN1 suggest, can undermine the quality of service received by the patient.

In addition to the reduction in staff numbers, all clinics reported reducing the number of patients that they admitted for antenatal care. For example:

> Currently, due to Covid-19 pandemic we have put in place restrictive measures at antenatal clinic. We have reduced the number of pregnant women who attend so that they should be observing social distance of 1 meter when they are at that place. When it's their first time to attend antenatal clinic, initially we were assisting about 50 pregnant women, but as of now the number has been reduced to 20 women in order to avoid congestion. For pregnant women who come for deliveries, we can't give them limit because we can't know when each woman will deliver, so they still come as they used to. [XDN2]

The aim of reducing the patients seen in antenatal care is, as described above, to ensure that social distancing can be observed in the waiting area. As this nurse/midwife describes, it is also due to the long waiting periods:

> Pregnant women coming for initial antenatal visit stay for a long time, so the number has been reduced from women coming anyhow [any number] to 30 women per day and 40 pregnant women who are continuing their antenatal visits. We haven't set any limit for pregnant women coming for deliveries and women who have delivered. As I said, women who have delivered don't come for check-up. [BYN1]

Across the dataset, the account of BYN1 was typical: no restrictions on women entering labour were reported. Post-natal check-ups were not referred to in many of the interviews, but it is notable that BYN1 reports that these are suspended in her clinic.

Across the dataset, nurse/midwives reported that restrictions to appointment numbers have been operationalised on a first-come-first-served basis.

> The changes which have been made like at antenatal; I already explained that in a week we could look after 1000 women or above, and in a day we would see more than 200 women but because of this pandemic and the limited space we have at antenatal clinic for women to sit, they reduced the number to 100 women who come earlier. These women are given numbers. This means the first 100 women who

> came first we give them care but the rest are sent back, so it's one of the changes we have made by taking care of few women than we were doing before. [DAN1]

The consequence of this system is that large number sof women are sent home each day without receiving care and no guarantee of receiving care on another day, when they may also fall outside of the daily quota.

In some instances, communities are resisting the quota measures, as described here:

> Okay, at antenatal clinic we made an initiative that we should be assisting few pregnant women, like 30 in total. But what is happening is that we are failing to assist 30 women because the other women still demand that we should also assist them. When 70 or 80 pregnant women have come, the remaining women still demand that we should assist them. It's a challenging thing because even if we tell the women to go back, it's our image as health workers that go bad. So we still work and I can say that nothing has changed. [JMN1]

Faced with women who refuse to return home, some clinics have continued to operate within the pre-COVID system of attending to all women that show up to a clinic.

A final notable shift in operational practice relates to the 'waiting homes' where women who live a distance from the clinic and are close to labour conventionally come and stay to ensure that they can deliver in a clinical setting. In this account, a nurse/midwife described the closure of the 'waiting room':

> And the other thing is; on the issue of waiting home, we had a home where women who are coming from a far place could stay as they are waiting to deliver, but because of this pandemic we don't want a large number of people to stay at one place so they closed this home and women don't come anymore. Some women who come at the clinic with other complications or feeling signs of labour, we test them and if the results show no signs of delivery we just observe them for a day, then we ask whether their home is nearby or not. If it's nearby we sent them back and advise them to come back but at first if a woman has come with signs of labour we couldn't discharge her until she delivers but at present we discharge her because we fear that she can stay longer at the hospital. [MKN2]

Clinics are dividing clinical teams into two, to allow the clinics to continue to operate in the event that one of the teams encounters a confirmed case of COVID-19. This has put pressure on the staff to patient ratio and some suggest this is limiting the quality of care being provided. Clinics are also limiting the number of patients they see in the antenatal clinics on a first-come-first-served basis and sending women home when they reach their daily quota. In some communities, women are resisting these restrictions and forcing clinics to admit them by refusing to leave. While no restrictions have been applied to the number of women receiving care when entering labour, waiting homes have been closed and there are reports of post-natal check-ups being suspended.

Reflections on working under COVID-19

In this section, we move beyond describing the practical changes that have been implemented in the clinics and present nurse/midwife reflections on the consequences and effects of these changes.

Some interviewees noted that the reduction in numbers at the clinic – both patients and colleagues – had both positive and negative consequences:

> Changes like reducing our working hours and reducing number of pregnant women we assist on a day is okay because we assist few women at an appropriate time, but reducing number of staffs has affected us because we are supposed to assist each other when doing our work. There are other things that I can't deal with but the person who knows it better is not there. So it's difficult unlike when we are all working at the same time because we know that this health worker knows this thing very well, but all of us don't work at the same time like in the past. [BYN1]

On the one hand, the working day is shorter, but on the other, the limited staff numbers means that specialist knowledge or skill is sometimes absent from the team. When asked whether women's care needs were being met during COVID-19, the issue of specialist care came up regularly. In the following account, the nurse/midwife felt that the absence of doctors for specialist service was the only significant change in the quality of care offered:

> No, when we have selected 100 women we provide services to them like we were doing before and every examination or check-ups and tests we conduct however in the past there was a special clinic where specialists could look after pregnant women during antenatal, this was done twice a week but now it's done once a week, so a woman can come for antenatal services and if there is a need to be seen by the doctor she fails because the doctor isn't there and we just refer the woman to the labour ward. This doesn't mean there is a big change in services that she access just that instead of being seen by the special doctor, she is seen at the labour ward and get the same care. [MKN2]

However, staff at other facilities felt that COVID-19 has had significant impact on the quality of care:

> They are not given realistic care and some of the things are missed because they are not examined at a proper time and those women are also worried that they are at risk because some of the complications cannot be rectified quickly. [JMN1]

Specifically, this nurse/midwife raises concerns that some women are no longer receiving appropriate examinations at the correct time, increasing the likelihood that preventable complications go untreated.

Throughout the dataset, nurse/midwives expressed fear. The focus of the fear, for many of our interviewees, related to the exposure they had to large numbers of patients:

> Aah, I work in fear because we meet different kind of patients. As it happens with Covid-19, we were asking them if they travelled outside the country, so some of them who were on self-isolation were coming without finishing quarantine period. They were still within those 14 days [quarantine] but they were still coming to the hospital so that we should assist them. We live in fear as of now because we don't know the status of patients when assisting them, so we actually have fear. [ZKN1]

In this account, the patients who have spent time outside of the country and have not followed quarantine rules were of particular concern. Another nurse/midwife summed up her fears in the following way:

> I want to add that we have been extremely affected by this pandemic, especially us health workers, we feel very scared. As I said, we didn't undergo training, shortage of personal protective equipment and we have families. We hear on the radios that other people discriminate us saying we are at high risk and can infect them with this disease. So we are really affected. [YZN2]

A lack of training, limited access to PPE, concerns about exposing their family and stigmatisation from the wider community all weigh heavy on this nurse/midwife.

For some nurse/midwives, reduced working hours is a positive aspect of the COVID-19 pandemic. There is concern that specialist knowledge and skills are absent as a consequence of reduced staffing. Some suggest that the quality of care has been significantly compromised, with preventable complications being missed in routine care. There is widespread fear among nurse/midwives who are concerned about contracting COVID-19 from patients, passing it onto their families and facing stigma from their communities.

Future practice

In this section, we present the suggestions that nurse/midwives made for future practices. These fall into three broad categories: practices which they wish to see end; practices they wish to see continue; and practices which they would like introduced.

A recurring request throughout the narratives we collected related to better provision of PPE:

> Second thing is PPE's, they should help us by giving us recommended equipment not the ones we are getting. Like apron has to cover us the whole body, on the arms it should be long sleeved and going to the bottom and putting on gumboots, of course they gave us gumboots but we don't have headgears, goggles and the aprons which can cover us from head to toe. Other partners helped us with hand sanitizers and we have hand washing soap; we also have buckets but we don't want the masks which are supplied instead we want them to give us the recommended masks which are N95 because they are the ones which are used, and they should give us enough. [SBN2]

PPE provision and use was also identified as one of the practices which should continue once the COVID-19 pandemic is under control. For example, this nurse described a desire to continue wearing protective gloves for examinations:

> Putting on gloves should continue because diseases like hepatitis also spread through fluids. If we can continue wearing gloves when touching women that can be perfect. We are not fighting Covid-19 only but many other diseases as well. If we can continue wearing gloves, we can still protect ourselves from diseases like hepatitis. [RBN1]

Following on from this, another common suggestion was that hand hygiene and social distancing measures could continue in the future:

> Washing hands, previously we were not telling people to wash their hands when entering into the examination room; social distance is also a good development because it's not only Covid-19 which someone has to protect herself from but even cough, TB and other diseases. So social distance can help one to avoid contracting diseases; washing hands can also help a person to avoid so many diseases such as; Cholera, diarrhoea and sometimes cold and flu, and there are some germs which we can get through touching of our nose or mouth, so this initiative is good and should be maintained. [JMN1]

This account was repeated by many nurse/midwives who noted that COVID-19 prevention also works to prevent other infectious diseases.

Among the practices that were viewed as problematic and in need of suspension or revision, the limits placed on patient numbers were raised frequently.

> Change which is unnecessary is like what I talked about suspending clinic/services. Those women were supposed to be examined and we shouldn't also set a limit for women who come to access care at the hospital. They are supposed to be coming and we shouldn't set a limit that maybe 30 or 40 women should be coming. There should be enough working staffs at the hospital, there shouldn't be few staffs coming or spend little time. If the hospital is supposed to be open for 24 hours or if we are supposed to work 8 hours, we should still be working that time so that patients should be assisted. [BYN1]

In this account, the nurse/midwife suggests that seeing patients should be the priority and that services should open longer to accommodate patients safely, rather than impose limits on numbers.

Not all Nurse/midwives shared this view, however. Some noted that reduced numbers had benefits for their clinical practice:

> Reducing number of pregnant women attending antenatal appointment is one of the changes which is helpful, as I said when people come in small numbers a health care worker will be in a position to recognize those having problems easily and help them in a quicker manner. Then as I said in wards we were keeping patients for long time

> but nowadays whenever we find that patients are better off we discharge them to avoid congestion we have also observed that it is a good thing. [YZN2]

Another change to practice that should be discontinued was identified in post-natal care by one of the nurse/midwives.

> The change which is unnecessary is that of discharging women who have just delivered with their babies and we advise them to come again after 6 weeks. In the past, they were coming again after 1 week in order for us to examine how they feel with their baby, but due to this disease [Covid-19] we advise them to come again after 6 weeks. They should only come quickly if they have certain problems. So I think this change will create problems to mothers as well as their babies. [XDN2]

Finally, suggestions for innovation in future practice included a request for more community education on COVID-19, noting that this is often lacking and that some consider the disease to be a hoax. For example:

> Yes, the other thing is that women who live in the communities should be informed the actual truth about Covid-19 because when they come to the hospital it's when we know that there is a problem. Women don't have knowledge about Covid-19, like on how they can protect themselves. They need to be told that this disease is real because others think that these are just hearsays. [KWN2]

Nurse/midwives reported that PPE provision needs to improve and should be carried forward into post-COVID practice. Hygiene and social distancing measures were also viewed as positive developments that would have benefit post-COVID. There were calls for limiting patient numbers at clinic to end so that all women can be seen and for post-natal check-ups to resume to prevent avoidable post-natal complications. However, some nurses noted that reducing numbers at the clinic has in some instances enabled them to work more efficiently with their patients and in a more targeted manner. Community education is needed to improve prevention and combat suggestions that COVID-19 is not real.

Women's accounts of changes to care

In this section we present the accounts of the 14 pregnant women and the 4 women who delivered recently. We describe the prevention measures that they observed in the clinic, the changes to the care and services they received and their perspectives on what future care should include.

Accounts of COVID-19 prevention in clinic

Across the sample, women provided a range of accounts of how COVID-19 prevention measures have been implanted in the clinics that they attend. Many of these accounts began outside of the clinic, with screening or restrictions in place to limit entrance to the clinic space. For example:

> Aah, the other thing that has changed is on how we enter the room. When we arrive there as of now we wait outside. When the time comes for us to enter the room, they measure our temperature. When they discover that your temperature is not okay, they send you back, but if it's just okay, they allow you to enter. So this is what has also changed. [BCW1]

In this instance, temperature screens were used to screen women before they were given access to the clinic. In other accounts, masks and handwashing were required before progressing beyond the front gate or entrance of the hospital. As one woman noted:

> Anyone who doesn't wear a mask is sent back to look for it and without a mask the health care workers are not treating anyone. [MJW1]

Once admitted into the clinic space, women often described careful implementation of hand hygiene. For example:

> They placed buckets of water for washing hands with soap at the antenatal clinic. They were making sure that every pregnant woman who enter the room for measurements and lessons concerning our expected babies should wash hands with soap. We were sent back, if we haven't washed hands because there was somebody who was telling us to wash hands. [MDW2]

Women commonly reported that social distancing measures were implemented while moving around the clinic space or sitting waiting to be seen. For example:

> They were making sure that we should observe a social distance of 1 metre when we enter the room. They were making sure that we shouldn't sit close to each other, but far apart. If there is no space there, they were telling some of us to wait outside so that if they finish assisting other women it's when we should enter. [MBW1]

While the majority of women described the successful implementation of at least one form of prevention measure, a minority described attending clinics where none were implemented. For example:

> There is no social distance in health facilities and we were overcrowded. We had also run out of water for washing hands in the buckets and in other health centres there is no water completely, so we are at risk because we become congested at one place. And people are not wearing masks. [MCW2]

A final form of prevention that women described taking place in the clinic was COVID-19 education sessions. For example:

> The other thing that has changed is that, in the past when we start antenatal clinic, they were just teaching us how we can care for our pregnancy but as of now they also explain about Covid-19. They teach us on how it is transmitted, how we can prevent ourselves and its risk. They explain all these things before examining us. [BCW1]

In the majority of clinics women are often screened before entering the clinic by checking temperatures, they are required to wear masks and to wash their hands. Once in the clinic, social distancing and hand hygiene measures are commonly in place. However, some participants reported that no preventative measures were in place during their last clinic visit. Finally, education sessions relating to COVID-19 and its prevention are being implemented in some clinics.

Changes to services experienced by women

In this section we focus on describing the accounts women gave us of the changes to the services they receive at maternity clinics.

The practice of limiting access to clinics to a reduced number of patients was a significant issue raised by most of the women that participated in the study. While some accepted that it might be helpful for limiting the spread of COVID-19, many raised substantial concerns about the impacts it is having. For example:

> I went to attend antenatal clinic today but, I just came back without being assisted. Today is my sixth day for returning back after I went to start attending antenatal clinic. I haven't started, but I did all the tests including testing HIV. But because I was number 21, they said that I should come back. I am planning to go there very early in the morning like around 2:00am so that I should arrive earlier than my friends and attend antenatal clinic. This is very difficult because we can end up being attacked just because of wanting to attend antenatal clinic. So this is very challenging to us. [MCW2]

This account encapsulates some of the most common grievances. Women are making multiple trips before succeeding in gaining access to the clinic; are having to get up very early in the morning to get a place at the front of the queue; and are taking risks to attend the clinic. Another woman pointed out that the multiple journeys that women have to make runs counter to the advice to limit movements:

> It was like they travelled twice on a journey that they could have gone only once. This can also make them to be at risk because they say that we should be staying home due to Covid-19, but they failed to stay at home the next day because they went to attend antenatal clinic. [BCW1]

In addition, multiple women pointed out that making unnecessary trips while pregnant is hard on their bodies:

> So this affected us as pregnant women because we travelled all the way from home in order to get assistance. As a pregnant woman, I was feeling tired and had a lot of general body pains. [DXW2]

Alongside the limits placed on the number of women entering the clinics, some interviewees noticed that the nature of the services they received had changed. For example:

> Covid-19 has affected my pregnancy because when we go to attend antenatal clinic, before this disease, they were testing us everything like full blood count and they were testing us properly. There is also a difference in the way they used to care for us in the past with this present time. When we go to the hospital as of now, they just measure our blood pressure and examine our pregnancy. The way they touch us on our stomach is different from the past, before this covid-19 pandemic. The other thing is that, when we go to start antenatal clinic, they tell us to go again when we are about to deliver. This implies that they won't be examining us during the period in-between. This is a threat to us because as pregnant women, there are a lot of things that happen in our body. [BCW1]

In this account, we are told that blood tests and examinations have either not been carried or changed. Furthermore, women are being encouraged to reduce the number of visits to the antenatal clinics before giving birth.

In some instances, women even reported that they were not weighed and did not have their blood pressures taken:

> **I: Apart from being told not to go back until the time of delivery, what else did you observe at the clinic which was different?**
> P: No measurement of weight, or checking blood pressure but such things are very important to a pregnant woman, in the past everything was done accordingly. [MJW1]

Others reported that scanning services have been stopped:

> A while ago they suspended scanning, among the pregnant women some get scheduled for scanning but they stopped offering these scanning services. [ZAW1]

In addition to the suspension of services, approaches to administering medicines have changed. One woman described how the anti-malarials they receive in clinic are no longer taken at the clinic:

> Aah on antenatal services what happens is that when we go there, we are given drugs called fansidar to take and after taking we go home, although it has its own side effects but when we go home we forget. Nowadays they give us and advise us to take them at home of which we just keep them at home without taking. We think of taking the drugs when we are not feeling well. The health workers give us once a month and repeat the next month on the same date we visited the clinic but yet we don't follow what we have been advised. [MDW1]

This woman suggests that moving women's anti-malarial treatment out of the clinic makes some women less likely to take the medication as prescribed.

Another area in which women reported changes to the services they receive relates to access to doctors. For example:

> I came for antennal clinic, and they have told me to see the doctor but I haven't seen the doctor yet and am still outside the hospital waiting, so my worry is the care is not sufficient considering that this is my month. The other thing is, the doctor hasn't seen what has been written on my health passport, so am worried when the labour signs begin where exactly should I go… because the doctor said other things that maybe the child isn't properly positioned and he referred me to a specialist but it's impossible to meet this doctor because of how things are at the hospital. [DXW2]

Concerns about being unable to access doctors were also reported by women who were known to have a higher-risk pregnancy:

> Okay, I am at high risk because during my first pregnancy, the foetus died inside the womb. During my second pregnancy, I gave birth to a child who is still alive. During my third pregnancy, the foetus also died inside the womb. They tried to examine the cause of this but they didn't find anything. So the intention of putting me at high risk is that I should be examined now and again by a doctor. Had it been that there wasn't Covid-19, doctors would have been examining me every three weeks. But due to Covid-19 they have extended the time and I will be examined after two months. [BCW1]

While every account we collected contained at least one observation of change to the services women are receiving in clinic, some women reported that they felt there was no real change to their clinical experience:

> Aah what can I say? Mmh at antenatal care (laughter) it has not impacted me because we do as we used to do in the past. [LMW3]

As clinics have reduced numbers attending and have smaller clinic teams, women are being sent home without being seen, requiring them to make multiple journeys to the clinic, often setting off early in the morning. These journeys are risky, as they expose them to attack and to COVID-19, and are also tiring. Women have noticed that the services they receive often seem reduced e.g. limited testing, scanning and examination. Drugs are no longer administered in clinics, raising concerns about adherence. Doctors are often hard to access when specialist advice and care is needed. Some women have not noticed much change to the services they access.

Changes relating to delivery

While our sample included only 4 women who had given birth during the COVID-19 pandemic, their accounts of giving birth are revealing. One woman describes how the procedures and arrangements surrounding her delivery were focussed on limiting the potential for transmission:

> There was a change at maternity wards. The change was that they were allowing one guardian to take care for a pregnant woman, this was different from the past because in the past they were allowing many people whether church members, neighbours who had come were allowed to enter inside so that they can see their

> friend or baby, but during this Covid-19 pandemic they only allow one guardian. The same guardian we went with when we were experiencing labour pains. They were not allowing anyone else to enter that room. They were also making sure that we should be following sanitation measures like washing hands with soap regularly and we should also have masks for protecting us from Covid-19. [MDW2]

While this first account suggests that some clinics have been able to adjust to the challenges of operating a labour ward during COVID-19, this second account suggests others have struggled:

> During the time of delivery, I didn't plan to give birth at a private hospital. I planned to deliver at [Hospital] because it's where I was referred. When I arrived there, I met with pregnant women coming from [Location]. They left [Location] because the hospital was closed after one of the health workers was diagnosed with Covid-19. So pregnant women from there came to [Hospital]. The situation wasn't good enough because there was overcrowding and doctors and nurses weren't assisting us properly maybe due to fatigue. The rooms were highly congested that I wouldn't have managed to deliver there. I just left and delivered at a certain private hospital, which was a thing I didn't plan. When I was at [Hospital], a certain pregnant woman who came wasn't assisted and she ended up delivering her baby in the corridor. As pregnant women, we were even feeling pity to each other by seeing this. Doctors and nurses were just neglecting this maybe due to fatigue or other things. I could see the baby coming out of her, so this affected me and I delivered my baby through caesarean section. I delivered normally my other two children, so I gave birth through caesarean section. It might happen that the things which I was observing where I just left [Hospital], affected me, so this is what I think. [VMW3]

In some clinics, labour procedures have been adapted to focus on minimising transmission. This includes limiting the number of guardians and visitors which women are allowed to receive. In other clinics, staff have struggled to attend adequately to large numbers of women needing assistance, sometimes fuelled by closure of other facilities due to COVID-19 cases.

Women's perspectives on future care

In this section, we present the suggestions and requests made by women we interviewed when reflecting on how maternity services should be organised in the future, both during COVID-19 and beyond.

Almost all women were united in the desire to see an end to being 'sent back':

> They should just change on that by having other means of helping every woman who goes to antenatal clinic without sending them back. They should be able to help a woman who is due or else a woman who might visit the clinic with health complications because if they send her back she can deliver on the way back home without attending antenatal clinic. [MJW1]

Some suggested that this could be achieved by extending the number of days on which the clinic runs:

> If the work can be done every day from Monday to Friday it can work, because we become congested as a result of working once on Tuesday's, so if they start to work every day they can help a number of women today, and tomorrow another group of women and the other day other women, then this can make everywoman receive the healthcare from the clinic. [MBW1]

There were also requests for greater attention to hygiene and prevention practices. For example:

> They should add extra buckets of water for washing hands, and everyone should bring her cloth for bed spreading and everyone without wearing mask shouldn't be allowed to enter into the clinic unless she/he wear a mask. This will encourage women to wear mask and they will know that if they don't put on a mask I will not be assisted. [MCW2]

Some noted that the reason women are often 'sent back' relates to the PPE that clinic staff have access to:

> The problem here [Location] is that they don't have working equipments, this is why they do that. The major issue is that government should provide working equipments [PPEs] to hospitals in order to protect them from Covid-19. Things like masks, as health workers in foreign countries wear when we watch TV. [MPW2]

When reflecting on the changes to anti-malarial drug administration, one woman suggested an alternative to sending women away to take their medication at home:

> Yes like I said the drugs which we are given to take at home, it's good that they want us to take them at home because sharing one cup by many people is not safe, they can advise everyone to carry water and cup from her home when going to the antenatal clinic so that they should have proof that everyone has taken the drug. [MDW1]

Alongside the requests for change, interviewees also pointed to changes initiated in response to COVID-19 that they would like maintained in post-COVID services:

> Okay, the change that I think might be good to continue with post the Covid-19 pandemic is washing of hands. We wash hands when entering and we also observe social distance. These things should continue because it's part of hygiene. Covid-19 is not the only disease, there are many diseases that are communicable like Tuberculosis, which we can infect each other through air. This issue of observing social distance and washing hands as part of hygiene should continue with post the Covid-19 pandemic. [ABW2]

As well as hygiene-related measures, some reported a desire to maintain smaller numbers of women at clinic:

> Reducing number of women should continue, and that's all. When they take care of small number of women, it's possible for us to return home in a good time. They can also help everyone with proper care because the healthcare providers can't get tired. [MBW1]

Women were very keen to see an end to the practice of sending women back from clinic when daily quotas are reached and suggested that clinics should expand their opening times to accommodate this. There were requests for more washing facilities and for clinics to make wearing masks mandatory. Women felt that government need to provide more PPE to healthcare professionals. It was suggested that women could bring their own water and cup to clinic to enable taking medicines on site. There was strong support for the continuation of the heightened hygiene measures and some voiced support for the continuation of limited numbers attending clinic to enable better care.

Preliminary Conclusions and Recommendations

The early impact of COVID-19 was very disruptive to maternity services. Capacities have been limited. Services were re-configured in ways which unsettled both healthcare providers and women. COVID-19 prevention measures were put in place, but not always achieved.

COVID-19 has brought significant anxiety to both women and staff. Staff want more training and PPE. Women want to be seen and not to be sent home. Increased hygiene practices praised by both staff and patients. Several of the early practices that were adopted were considered to be useful and could be continued post pandemic.

It should be noted that this work was undertaken very early in the pandemic and at the time of interviews, several were aware of, but had not had time to fully adopt, the Malawi Ministry of Health COVID-19 guidelines for Maternal and Newborn Health Services which were introduced in June 2020. As the pandemic evolves, further evaluation is needed to ensure the best environment for both women and staff attending and working in maternity services and to ensure that learning from any 'best practice' measures can be taken forward post pandemic to optimise outcomes for mothers and their babies.

Appendix A: Patient Interview Topic Guide

I am going to ask you some questions about any impact of Covid-19 on your pregnancy. We will start with some general questions about you and then move on to discuss your views. If you don't want to answer any of the questions then we can move to the next one.

1. At what stage of pregnancy are you? (if currently pregnant) or How long ago did you have your baby? (if recently pregnant)
2. How many previous pregnancies have you had?
3. How old are you?
4. What job or work do you do?
5. In which region of Malawi do you live?

We will now move on to some questions to discuss your views:

6. What impact has Covid-19 had on your pregnancy experience?
7. What changes have you had to make to your daily routine and home/work life?
8. How do these changes make you feel?
9. What impact has Covid-19 had on your antenatal care?
10. What impact has Covid-19 had on your birth plans?
11. What things could be done differently to help you during the Covid-19 pandemic?
12. Please give an example of a change that has been made to your antenatal care that you think might be good to continue with post the covid-19 pandemic.
13. Please give an example of a change that has been made that you consider to be unnecessary or that you think might have an adverse effect on your health in pregnancy.
14. Is there anything else you would like to tell me about?

Appendix B: Healthcare Professional Interview Topic Guide

I am going to ask you some questions about the impact that Covid-19 has had on your job looking after pregnant women. We will start with some general questions about where you work and then move on to discuss your views. If you don't want to answer any of the questions then we can move to the next one.

1. In which region of Malawi do you work?
2. What sort of Health Care Facility do you work in?
3. What job do you do to look after pregnant women?
4. How long have you done this job for?
5. Prior to Covid-19, approximately how many pregnant women would you look after in a week?

We will now move on to some questions to discuss your views:

6. What impact has Covid-19 had on the way you deliver care to pregnant women?
7. What changes have you had to make to your daily routine at work and the workplace environment?
8. How do these changes in healthcare delivery make you feel?
9. What impact do you think these changes will have on women's health in pregnancy in Malawi?
10. What things could be done differently to make your job looking after pregnant women better during the Covid-19 pandemic?
11. Please give an example of a change that has been made to healthcare delivery that you think might be good to continue with post the covid-19 pandemic.
12. Please give an example of a change that has been made that you consider to be unnecessary or that you think might have an adverse effect on women's health in pregnancy.
13. Is there anything else you would like to tell me about?

About the research team

Enita Phiri-Makwakwa (Malawi Epidemiology and Intervention Research Unit (MEIRU)) led the research team in Malawi. Enita helped design the study, produced documents for the ethics committee, managed the researchers who collected data, contributed to data analysis and helped draft this report.

Prof. Rebecca Reynolds (University of Edinburgh) led the research team in Scotland. Rebecca led the design of the study and secured funding, supported the ethics application, provided intellectual input into the analysis and helped draft this report.

Catharine Bamuya (MEIRU) contributed to data analysis and helped draft this report.

Dr. Christopher Bunn (University of Glasgow) co-ordinated and conducted data analysis and led the drafting and design of the report.

Dr. Luis Gadama (College of Medicine) contributed to the design of the study, liaised with Directors of Health & Social Services the participating districts to gain support for the study, supported the ethics application, provided intellectual input into the analysis and helped draft this report.

Fanny Kachale (Ministry of Health, Reproductive Health Unit) contributed to the design of the study, supported the ethics application and helped draft this report.

Prof. Mia Crampin (MEIRU) contributed to the design of the study, led the ethics application, provided intellectual input into the analysis and helped draft this report.

At MEIRU, a team of interviewers conducted the interviews and translated and transcribed them: Green Kapira, Dorothy Makoka, Melvis Mwalwimba, Aaron Ndovi and Donaria Zgambo. Julita Malava oversaw the research in Chilumba. Odala Chithodwe provided data management services. Justice Khosa provided administrative support. Laurence Tembo and Joshua Sikwese delivered financial management for the project.

At the University of Edinburgh Prof. Liz Grant, Dr. Sarah Stock and Sonia Whyte had input into the design of the study and the funding application, supported the ethics application, and helped draft this report.

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