

Title: “Getting pregnant during the COVID 19 was a big risk because getting the help from the clinic was not easy”: COVID-19 experiences of women and healthcare providers in Harare, Zimbabwe.

Authors

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27 **Summary box**

28 **What is already known on this topic** – Studies have shown that the COVID-19 pandemic and
 29 associated control measures have disrupted provision of maternal and neonatal healthcare services
 30 globally.

31 **What this study adds** - The COVID-19 pandemic disrupted provision and uptake of PMTCT services;
 32 antenatal care contacts were significantly reduced, home deliveries increased, and babies born at
 33 home missed out on the necessary ARV prophylaxis.

34 **How this study might affect research, practice, or policy** - Our findings underline the importance of
 35 investing in robust health systems that are able to respond to emergency situations to ensure
 36 continuity of essential HIV prevention, treatment, and care services.

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48 **Abstract**

49 Background

50 The COVID-19 pandemic and associated measures may have disrupted delivery of maternal and
 51 neonatal healthcare services and reversed the progress made towards dual elimination of mother-to-
 52 child transmission of HIV and syphilis in Zimbabwe. This qualitative study explores the impact of the
 53 pandemic on the provision and uptake of prevention of mother-to-child transmission (PMTCT)
 54 services from the perspectives of women and maternal healthcare providers.

55 Methods

56 Longitudinal in-depth interviews were conducted with 20 pregnant and breastfeeding women aged 20-
 57 39 years living with HIV and 20 healthcare workers in two maternity polyclinics in low-income suburbs
 58 of Harare, Zimbabwe. Semi-structured interviews were held after the second and third waves of
 59 COVID-19 in March and November 2021 respectively. Data were analysed using the modified
 60 grounded theory approach.

61 Results

62 While eight antenatal care contacts are recommended by Zimbabwe's Ministry of Health and Child
 63 Care, women reported only being able to access two contacts. At antenatal booking, women were told
 64 to return at onset of labour; subsequent visits were suspended. Healthcare workers reported this
 65 reduction in antenatal attendance was a result of limited availability of personal protective equipment

and fear that patients and services providers would contract SARS-CoV-2. Although HIV testing, antiretroviral therapy (ART) refills and syphilis screening services were accessible at first contact, other services such as HIV-viral load monitoring and enhanced adherence counselling were not available for those on ART. Closure of clinics and shortened operating hours during the second COVID-19 wave resulted in more antenatal bookings occurring later during pregnancy and more home deliveries. Six of the 20 interviewed women reported giving birth at home assisted by untrained traditional midwives as clinics were closed. Babies delivered at home missed ART) prophylaxis and HIV testing at birth despite being HIV-exposed. Although women were faced with multiple challenges, they continued to attempt to access services after delivery.

Conclusions

The COVID-19 pandemic disrupted provision and uptake of PMTCT services; antenatal care contacts were significantly reduced, home deliveries increased, and babies born at home missed out on the necessary ARV prophylaxis. These findings underline the importance of investing in robust health systems that are able to respond to emergency situations to ensure continuity of essential HIV prevention, treatment, and care services.

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89 **Introduction**

90 Zimbabwe recorded its first SARS-CoV-2 on 20th March 2020 and by November, 30, 2022,

91 Zimbabwe had recorded 257,893 cases and 5,606 deaths [1] which is likely a huge underestimation

92 due to limited testing coverage. The government of Zimbabwe instituted a number of policy,

93 institutional and operational measures to contain community transmission of SARS-CoV-2 and

94 prepare the fragile health system for an upsurge of cases [2, 3]. Public movement was restricted,

95 gatherings were prohibited, informal markets, schools and other services were closed except those

96 considered essential [4]. While these measures sought to curb the spread of SARS-CoV-2,

97 experience from West Africa suggest that healthcare systems are broadly adversely affected by

98 pandemics [5, 6]. In Guinea and Sierra Leone, maternal and child health indicators worsened

99 substantially during the 2014 Ebola outbreak, with recovery still incomplete years later [7].

100 At the onset of the COVID-19 pandemic in Zimbabwe a number of demand and supply challenges

101 were reported which disrupted uptake of health services. Reassignment of medical and laboratory

102 staff, reallocation of resources, closure of healthcare facilities and insufficient personal protective

103 equipment (PPE) resulted in reduced availability of clinical care in some settings, compounded by

104 lack of availability of public transport which prevented health care staff getting to work [8, 9].

105 Healthcare workers went on strike due to the lack of PPE further compromising patients' access to

106 care [10]. Decreased care seeking was reported due to difficulty in navigating police road-blocks
107 coupled with fear, mistrust and financial difficulties during lockdowns [11].

108 Emerging evidence from low-income countries suggests severe COVID-19 related disruptions to
109 healthcare in early 2020 [11, 12]. In 2020 the Global Fund reported widespread disruptions to HIV,
110 TB and malaria service delivery, impacting approximately three-quarters of HIV, TB and malaria
111 programs [12]. A rapid assessment conducted in Zimbabwe between March and April 2020 found that
112 about 19% of people with HIV were unable to get ART [13], and similar data have been reported in
113 other African countries[14-17]. Disruptions in HIV treatment and care services threatens the
114 remarkable progress made towards elimination of HIV transmission, morbidity, and mortality. As
115 pandemics disrupt health systems and affect human health globally it becomes important to
116 understand the impact the COVID 19 had on the provision and uptake of Prevention of Mother-to-
117 child Transmission (PMTCT) of HIV and syphilis services.

118 Zimbabwe has registered notable declines in HIV prevalence in the last decade, but continues to have
119 one of the highest HIV burdens in Southern Africa [18]. HIV prevalence is estimated at 11.8% among
120 women and men aged 15-49 years [18] and 16.7% among pregnant women [19, 20]. In 2011,
121 Zimbabwe scaled up an accelerated national PMTCT program to eliminate paediatric HIV. The
122 PMTCT services are integrated within all the public health facilities (1560) providing antenatal care
123 (ANC) and maternal and child health services and Zimbabwe is targeting dual elimination of HIV and
124 syphilis by Dec 2025 [21, 22].

125 In 2013 the Ministry of Health and Child Care (MoHCC) adopted the WHO guideline which
126 recommended the provision of lifelong Antiretroviral Therapy (ART) to all HIV positive pregnant and
127 breastfeeding women (Option B+) [25, 26]. With the implementation of Option B+, pregnant women
128 are encouraged to register for ANC services in the first 12 weeks of pregnancy and have at least eight
129 antenatal contact visits [28]. Dual HIV and syphilis testing services are offered to all women through
130 an “opt-out” strategy at the first ANC contact [29]. Women who test HIV positive and are already on
131 ART at first ANC visit continue with their treatment and have HIV viral load monitoring every 3 months
132 till delivery. ART naïve women are initiated on ART [27, 28, 30]. After delivery, the mother-infant pairs
133 are followed-up at maternal child health clinics until 24 months or the cessation of breastfeeding [27].
134 HIV negative women are retested at 32 weeks gestation and 6 weeks post-delivery.

135 In 2018, an estimated 93% of all pregnant and breastfeeding women living with HIV received ART
136 through the national PMTCT programme [22]. In 2019, HIV and syphilis antenatal testing coverage
137 were 98% and 91% respectively. The risk of vertical transmission at 18 months postnatal was
138 estimated at 15% in 2015 and had fallen to 7.8% in 2018 [22]. During 2019, 56% of HIV-exposed
139 infants received early infant diagnosis (EID) [26]. Although progress has been made in reducing
140 vertical transmission of HIV and syphilis, there were some gaps in the provision of PMTCT services
141 before the COVID-19 epidemic. The emergence of the COVID-19 pandemic is likely to have
142 dramatically disrupted delivery of maternal and neonatal healthcare services across the country. We
143 therefore conducted a qualitative study with pregnant and breastfeeding women, Health promoters
144 (known as Village Health Workers in rural areas) and Healthcare workers (HCWs) to describe the

impact of COVID-19 on provision and uptake of PMTCT services in urban low-income areas in Harare, Zimbabwe. Uptake of ANC in this study is defined as seeking ANC services from trained healthcare providers and remaining in care pre- and postnatally while provision of care is referring to the provision of a range of ANC services on time by trained healthcare providers. This qualitative study was part and parcel of wider mixed method study which retrospectively looked at the effects of COVID-19 key PMTCT indicators using programme (District Health Information System-2) and population level data (ZIMSTAT) [23] and analysis of the outcomes of HIV-exposed neonates using NeoTree data [24].

Methods

Study design, sampling, and recruitment

Longitudinal semi-structured in-depth face to face interviews were held after the peak of the second and third waves of COVID-19 in March and November 2021 respectively. The first interviews were conducted after the introduction of the COVID-19 stringent measures to capture the women, health promoters and healthcare provider's perception of COVID-19. Repeat interviews with the same participants were conducted when COVID-19 measures were slightly eased.

The study was conducted in two City of Harare polyclinics which provide maternity services. Mabvuku and Kuwadzana polyclinics are located in low-income, densely populated, urban suburbs in Harare. The clinics were selected because they have some of the highest number of deliveries among the municipality-owned clinics in Harare [31].

Women living with HIV who were pregnant or had given birth in the preceding 12 months were purposively recruited. A list of all pregnant and breastfeeding women who were in care or had delivered between March 2020 and February 2021 was drawn from the ANC and delivery registers in the two clinics. From this a stratified purposive sample of 20 women was selected to ensure a wide range of experiences considering age, history and duration of ART use, parity, and outcome of delivery. Additionally, 10 health promoters and 10 HCWs were purposively recruited based on the years in service and age. They were followed up at the same timepoints with the pregnant and breastfeeding women. In Zimbabwe community-based health promoters act as liaisons between the health facility and the suburbs and are knowledgeable of various health issues within their communities, including the number of pregnant and breastfeeding women, children (alive and deceased) and women who have discontinued HIV care and treatment programmes. Healthcare workers employed by either of the two study clinics who provide direct healthcare services to pregnant women seeking ANC services were recruited. HCWs were included because of their integral role in the provision of PMTCT services and their insight into structural influences such as the availability and accessibility of these services at the health-facility level.

Data collection

All the participants had two repeat interviews conducted eight months apart. Data were collected by the first author and a trained research assistant using a semi-structured interview guide. All the interviews were conducted in Shona, the most widely spoken local language in Harare. Interviews lasted between 40 to 60 minutes. Interviews adhered to the MoHCC-guidelines on prevention and

control of COVID-19 which included handwashing, wearing of masks, social distancing, and use of well-ventilated private rooms.

The first interviews conducted at the peak of the second COVID-19 wave in March 2021 explored retrospective experiences of being pregnant and giving birth during the first COVID-19 wave when there was little knowledge and severe preventative measures had been introduced. The interviews also explored current experiences during the second wave when restrictions were being relaxed. The second interviews were conducted in November 2021 before the subsequent surge in COVID-19 driven by the omicron variant when COVID-19 restrictions were relaxed, and information had become more widely available.

Data analysis

All audio-recorded data were transcribed and translated verbatim into English. A coding framework was developed by the first author and an experienced research coordinator. Transcripts were then uploaded, coded, and summarized using a qualitative software package (NVivo 9.0, QSR International). Data were analysed using the modified grounded theory approach. In the initial stages we explored emerging themes and then adopted a constant comparison approach between different participants and clinics. The findings are presented under two main themes: uptake and provision of maternal and child health services. The perspectives of the women, health promoters and HCWs are presented together.

Ethical Considerations

203 This study was granted ethical approval by the Joint Parirenyatwa Hospital and College of Health
204 Sciences Research Ethics Committee (JREC 196/2020) and the Medical Research Council of
205 Zimbabwe (MRCZ/A/2682). Approval to conduct the study was also granted by the MoHCC and City
206 of Harare Health Department. All participants provided written informed consent and participation was
207 voluntary.

208 **Patient and Public Involvement**

209 Patients and/or the public were not involved in the design, or conduct, or reporting of this research.
210 Patients and the public were however involved in the dissemination plans of this research as they
211 outlined their preferred dissemination platforms and format.

212 **Findings**

213 **Socio demographic characteristics of women, health promoters and healthcare providers**

214 Twenty women aged between 20-39 years were recruited. Of these, 17 were married and staying with
215 their partners, while two were not married and one was widowed during the course of her pregnancy.
216 The widow's partner had refused to be tested for HIV prior to the COVID-19 pandemic and eventually
217 died of HIV-related complications. Twelve were informal traders, seven were unemployed and only
218 one was formally employed. Sixteen women were breastfeeding while four were still pregnant at first
219 interview. Among the breastfeeding mothers, their infants were aged between one to nine months
220 while the pregnant mothers ranged between 13- and 28-weeks gestation. Nineteen had been infected
221 with HIV later in life while one was perinatally infected. Seventeen women knew their HIV status prior

to pregnancy while three were diagnosed following HIV testing at the first ANC contact and were immediately initiated on ART. Of the seventeen who knew their HIV status, fifteen were initiated on ART prior to pregnancy and two were not on ART despite knowing their HIV status. Denial of HIV status and fear of commencing ART were cited as the reasons for refusing ART. Of the seventeen that were married, fifteen knew their partner's HIV status and two did not. Of the twenty women, six were first time mothers while fourteen already had children ranging from two to five children.

Health promoters were aged between 30-64 years, four had completed secondary level education, two had partial secondary education while four had primary level education. All the health promoters had been working in the communities for more than five years. Among the 10 healthcare workers five were midwives and five were registered general nurses.

Uptake of maternal and child health services

Interviewed women, health promoters and HCWs talked about COVID-19 in terms of the challenges they experienced in accessing or providing healthcare services at family, community, and health facility level.

Fear of COVID 19 infection

At the family level, fear of contracting SARS-CoV-2 infection emerged as one barrier that deterred women from seeking ANC services. Women mentioned that they feared the highly infectious nature of the virus and that it was “uncurable and killing people in their thousands”. They feared failing to get the best possible care to help manage the infection if they got infected. Women anticipated

devastating effects at family and community levels judging from the high mortality rates they were seeing on various news channels from high income countries. They had to take precautionary measures which included minimizing their movements and interaction with people. Their fears were compounded by the myths and misconceptions circulated on social media platforms at a time when people had limited information about the pandemic.

"Fear gripped me, after I heard the number of people who were dying in countries abroad such as Italy. I have never heard of people dying in substantial numbers like that before and I imagined what it was going to do in a poor country like Zimbabwe and my poor community and I got so scared to such an extent that I did not want anyone near me or my family members. I was afraid to go to the shops, or to the borehole or even the clinic, I feared going out of my house as I could see COVID-19 all over in the air in people's hands. I did not want anyone coughing near me I can say I was so scared" (Participant 1, woman, in her 30s).

"I was afraid of COVID-19 because I heard that it was killing people with underlying health conditions like HIV. People were showing us videos of how people were getting infected in hospitals, and I imagined being in the same waiting area with someone with COVID or being attended to by a nurse with COVID and I was so scared and I told myself I will only go if there is a problem" (Participant 2 woman in her 20s).

During the first interviews which were conducted in March 2021, HCWs reported a decline in the number of women seeking ANC services due to a number of factors including fear of SARS-CoV-2

260 infection. Community members heard that HCWs had contracted SARS-CoV-2 and were afraid to
261 come to the facility as one HCW mentioned.

262 *"We have seen a decline in the number of patients, people are not coming as they used to do*
263 *because staff tested positive and the community heard about it, and so maybe they are*
264 *fearing that maybe when they come here, they might eh contract COVID- 19" (HCW 1).*

265 Health promoters also spoke about the negative reception they received during home visits leading
266 them to suspend the community follow ups. This is what they said:

267 *"We stopped doing home visits before the government announced the lockdown because*
268 *people did not want us to come into their homes. We would come across notices at the gates*
269 *or doors saying, 'do not enter we do not want visitors here'. Many people in the community*
270 *are still afraid of the virus considering how it is spread so they are not entertaining any visitors*
271 *(Health promoter 1).*

272 This fear was not limited to the women; health promoters and HCWs acknowledged being afraid
273 because of their increased exposure to and risk of contracting of SARS-CoV-2. Looking after family
274 members with underlying health conditions increased their fears.

275 *"It affected me a lot because I am a known diabetic and hypertensive patient, and I was afraid*
276 *and anxious that if I go to work what if I get infected with the disease... some of my*
277 *colleagues got infected and tested positive though with minor symptoms so I was worried*

278 *about doing home visits that maybe I will get the infection from there, so it was difficult for me*
 279 *to carry out my usual duties" (Health promoter 2).*

280 *"When the COVID started I was very afraid of getting the infection. I worried about getting the*
 281 *infection and passing it on to my mum who is asthmatic. I would dread coming to work and*
 282 *my fear worsened when my colleagues tested positive. As part of the mitigation measures, we*
 283 *resorted to use open spaces for our consultation since our rooms are very small and have*
 284 *poor ventilation" (HCW 2).*

285 During the follow up interviews in November 2021, healthcare workers reported less fear of infection
 286 and that women were slowly re-engaging with health services, though the numbers had not yet
 287 reached pre COVID 19 levels.

288 *"We are now beginning to see them [women] coming though the numbers are not as before*
 289 *COVID- 19. I guess it was the same with us [healthcare workers] we used to be afraid, but we*
 290 *are now used to working with clients and slowly getting back to our normal routine but at the*
 291 *same time being cautious since we don't have adequate PPE, and we had 12 of our staff*
 292 *members who got infected" (HCW 3).*

293 ***Fear of inadvertent HIV status disclosure to partners and other people***

294 In addition to the fear of contracting COVID-19 women also feared inadvertent disclosure of their HIV
 295 status. Of the 20 interviewed women, six had not disclosed their HIV status to their partners. They
 296 faced challenges in collecting medication for themselves and their infants. The continued presence of

297 their partners at home due to the travel restrictions made it difficult for these women to meet their
298 scheduled ART refills and even to take their medication or administer the nevirapine prophylaxis to
299 their babies. Prior to the COVID-19 pandemic some women would hide their medication and take it in
300 the absence of their partners. One HCW stated that;

301 *"The issue of disclosure is a big issue we have so many cases of women who refused to*
302 *disclose their status to their partners. So being in the same environment all the time, it was*
303 *quite difficult, some were not taking well while others could not observe time but would*
304 *randomly take at any opportunity which disrupted their routines. It was difficult and I think we*
305 *will see the effects of COVID-19 on adherence soon enough" (HCW 4).*

306 The COVID-19 pandemic also brought about confidentiality challenges for women accessing PMTCT
307 services. Prior to the COVID-19 pandemic, clients coming for routine HIV treatment and care services
308 had a designated space which afforded them more privacy. However, with the advent of the COVID-
309 19 mitigation and prevention measures, patients had to queue outside the clinics and have their ART
310 cards collected at the gate in the full view of other patients which inadvertently exposed their HIV
311 status. During the first interview some women reported having stopped collecting their medication for
312 fear of being stigmatised in their communities.

313 *"The difference now is that, if you come here, like some of us who are on ART, if you come*
314 *you are told to wait at the gate, so we do not want to be seen by many people, but the way*
315 *they are doing it nowadays makes it so difficult for us, everyone on the queue get to know*

316 *about our statuses... We stand in the same queue but when they come to collect cards, they*
 317 *say that those who are on ART please hand in your cards and then they will call us one by*
 318 *one. I once left without getting served as my sister-in-law was also in the queue..."*
 319 *(Participant 3 woman in her 30s).*

320 Health promoters also shared the same concerns about the inadvertent disclosure happening to
 321 patients queuing outside the clinics.

322 *"The clinic admin staff will go to the gate and collect the patients' cards, and after they look for*
 323 *their green cards and check them. They then go back to the gate and start to call their names*
 324 *out whilst everyone is listening, and they will be a lot of people there. It's like forced disclosure*
 325 *because you have no option because everyone else who will be at the gate will get to know*
 326 *that so and so is on ART. In the communities you hear them saying they will not come until*
 327 *COVID-19 is over but who knows when this will go away, and you can imagine what will*
 328 *happen to those mothers and their babies" (Health promoter 3).*

329 Fear of inadvertent disclosure also made it difficult for health promoters to follow up on women who
 330 disengaged with HIV services or missed ART refills during the COVID- 19 pandemic. The HCWs
 331 stated that before COVID-19, health promoters and Young Mentor Mothers would assist by tracking
 332 women living with HIV in the communities through home visits, but when COVID-19 came some
 333 women did not want to be followed up as they were staying with partners, in-laws, or relatives whom
 334 they had not disclosed to.

335 *"The challenge with some of these women is that they stay with their in-laws and other*
 336 *relatives who are not aware of their HIV status so it becomes difficult for these women to*
 337 *freely access services unlike before the pandemic when they could access services without*
 338 *telling anyone at home that they were going to the clinic. Now that everyone knows that*
 339 *movement is restricted, they would question their whereabouts" (HCW 2).*

340 By the time of the follow up interviews, travel restrictions had eased, and free movement had resumed
 341 and women were able to access services at the clinics without using their ART cards as travel
 342 passes. Women reported that they were now able to collect their own ARVs or their infant's
 343 medication without their partners and in laws knowing where they are going to. Health promoters also
 344 reported that they had resumed home visits though some women were still not allowing visitors to
 345 their homes and others still had their partners at home. Health promoters had also started educating
 346 and reassuring communities about the safety and the need to access essential services such as
 347 PMTCT services.

348 *"We have started conducting home visits and we are now going round educating people to go*
 349 *to the clinic when they have any health challenges. We have been assuring them that it is*
 350 *safe to seek services and that the clinics are doing all they can to protect patients from getting*
 351 *COVID-19" (Health promoter 4).*

352 ***ANC services registration, follow up and infant monitoring.***

COVID-19 and its related control measures were reported to have affected ANC registration from both the uptake and supply side. At the family level, the COVID-19 pandemic and associated measures disrupted their social and economic lives which had a spiral effect on women's uptake and utilization of health services. Closure of informal economy businesses including marketplaces and vending sites disadvantaged women from their only sources of livelihoods. Nine women stated that their partners lost income during the total shutdown while 12 women who were informal traders also lost opportunities to sell their wares. This affected household income, food security and ability to pay rent, resulting in some families relocating to their rural homes. Loss of income also impacted on their capacity to raise the USD25 required to register for ANC services within the City of Harare polyclinics. Five out of the twenty mothers that were interviewed reported registering their pregnancy after 28-weeks' gestation because of the need to pay a registration fee and the closure of clinics. Registering after 12 weeks is considered late as per the MoHCC guidelines.

Provision of maternal and child health service

Closure of clinics or reduced operating times resulted in women reporting difficulty with ANC registration, pre and postnatal care and facility delivery. During the first interviews, women narrated how difficult it was for them to register their pregnancy at the clinic, registration being the gateway to pre and postnatal care. However, despite all the challenges they encountered, women persisted trying to access PMTCT services for themselves and their babies. They repeatedly visited clinics to check if antenatal care and growth monitoring services had resumed.

372 *"I could not register on four times because for one to be among the 10 women they were*
 373 *taking per day you were supposed to be here by 4 am ... and one of the guards told us that*
 374 *some women were paying for overnight accommodation at one of the houses next to the*
 375 *clinic. I ended up paying \$7 USD to have accommodation and that's how I managed to join*
 376 *the queue on time and got served"* (Participant 4 woman in her 20s).

377 *"Things started to get slow at this clinic because of COVID-19, imagine we had to wake up at*
 378 *three in the morning to join the queue and then they say today we are not attending to clients,*
 379 *or they say that they are taking 5, or 10 people. So, it slowed service delivery so much. Like*
 380 *today I was here by 8 am but this is lunch time, and I am not yet served and after lunch they*
 381 *will be saying we are closing"* (Participants 5 woman, in her 20s).

382 Although ART provision or initiation, HIV testing and syphilis screening services were accessible at
 383 first contact, other services such as HIV-viral load monitoring, enhanced adherence counselling and
 384 other diagnostic services such as ultrasound scan imaging and laboratory services were limited.
 385 Women reported that HCWs stopped doing the regular ANC examinations and reduced consultation
 386 time in a bid to promote social distancing and reduce the exposure risk as they had limited PPE. None
 387 of the 20 interviewed women managed all 8 of the recommended ANC contact visits; six managed
 388 five contacts, three had four contacts, one had three contacts, eight women managed two contacts
 389 while two women had their first contact at the onset of labour. Of the nine women who had four or
 390 more ANC contact visits some contacts were made before the second COVID-19 wave when facilities
 391 had not started implementing stern mitigation measures. At the peak of the COVID- 19 women were

392 told at ANC registration to only come back at the onset of labour as other subsequent monitoring
393 visits were suspended in a bid to decongest the clinics.

394 *"Yes, getting pregnant was a big risk because getting the help from the clinic was not easy.*
395 *When I came to register the pregnancy, I was turned away and only managed to register on*
396 *the third attempt. After registering I was told to come back when I am due or if there is a*
397 *serious need. They stopped all the other monthly ANC visits and even if you showed up for*
398 *general consultation the nurses would just tell you to go back home so we missed some of*
399 *the services" (Participant 6, woman in her 30s).*

400 **Closure of clinics**

401 During the national lockdown, a number of maternity polyclinics, were closed in a bid to limit the
402 spread of SARS-CoV-2 and concentrate limited resources on the pandemic. HCWs reported that in
403 their experience the closure of polyclinics without prior notification led to an increase in home
404 deliveries. Clinics were closed as HCWs contracted or were exposed to COVID-19 and they had to
405 isolate or quarantine at home. One HCW commented.

406 *"We had to close, everyone was in isolation and they [mothers] had to go to neighbouring*
407 *clinics but some of them didn't have money to go to other clinics so, they delivered at home.*
408 *Those mothers, you will find them maybe accidentally and ask why they do not have baby*
409 *cards or maternity records then they will tell you that 'I gave birth at home' and has not been*
410 *initiated on ART and the baby is 8 weeks old" (HCW 5).*

411 Women who had booked for a facility delivery ended up giving birth at home assisted by untrained
412 traditional midwives as a last resort as clinics within their catchment areas were closed. Six women
413 who had planned a facility delivery ended up delivering at home. Women stated that their home
414 delivery experiences were painful; some mothers narrated how they delivered at the clinic gate having
415 been refused entry by the security guards as the clinic was closed.

416 Health promoters cited several incidences where mothers would call on them to assist them deliver
417 their babies. One health promoter had this to say.

418 *"Countless times people were calling us to assist them to deliver their babies, but we also*
419 *don't know how to do it, so a lot ended up delivering on their own or with the help of traditional*
420 *midwives. I know of a woman who reached a point of delivering by herself. The baby had a*
421 *twisted umbilical cord and the baby died. She did not have the money to call an ambulance or*
422 *even to look for someone to help, some of the traditional midwives were charging USD50"*
423 *(Health promoter 5).*

424 Babies who were delivered at home were at increased risk of getting infected with HIV as they either
425 delayed starting or did not receive the recommended nevirapine prophylaxis and missed the HIV
426 testing at birth despite being HIV-exposed. Most of the women also reported not receiving viral load
427 testing throughout their pregnancy. Healthcare workers also confirmed that babies that were delivered
428 at home missed essential PMTCT services. They stated that they are noticing babies coming for
429 immunization that missed the nevirapine prophylaxis at birth and HIV testing at birth and at 6 weeks.

430 *"We are seeing a number of babies that missed nevirapine dose, the first 72 hours, or babies*
 431 *who were never tested for HIV and some of the conditions they were giving birth in at home*
 432 *were dirty environments and you see babies with all sorts of infections" (HCW 6).*

433 HCWs also noted that they are beginning to see babies testing HIV positive at 6 weeks which had
 434 been rare. They stated that this could have been a result of the disruptions in viral load testing of
 435 pregnant mother, late HIV testing during pregnancy and babies missing ART prophylaxis.

436 *"We are beginning to record babies with an HIV positive result at 6 weeks which was now*
 437 *very rare. Before COVID-19 we would go for close to two or three months without recording*
 438 *any positives [babies testing positive] but now we are getting one of two per month and we all*
 439 *suspect it was because mothers failed to access services on time" (HCW 7).*

440 ***Increased workload***

441 Healthcare workers in the Kuwadzana clinic which remained fully operational throughout the various
 442 lockdowns and industrial action cited being overwhelmed by the increased number of women coming
 443 for services. HCWs mentioned that they had to suspend other services so that they could prioritise
 444 deliveries as they could hardly cope with the increased numbers coming from surrounding clinics.
 445 This was made worse by severe staff shortages as a result of staff needing to self-isolate following
 446 COVID-19 exposure. Additionally, some HCW took industrial action to protest shortage of PPE. Those
 447 HCWs at work, had to work long and overlapping shifts.

448 *"Sometimes we could not attend to all pregnant mothers, let's say they are 50 who want to be*
 449 *helped and there are just only two nurses at ANC department because some were on strike*
 450 *because of lack of PPE and some were sick and some in isolation so at most they were two*
 451 *or three nurses attending to deliveries, reviews and other services. The surrounding clinics*
 452 *were closed, and all the mothers were coming here so, the nurses did what they could do*
 453 *under the circumstances and prioritised those in labour, but it was the most draining time..."*
 454 *(HCW 8).*

455 HCWs faced difficulties getting to work due to the shortages of public transport. During the national
 456 lockdowns there was limited public transport, and no services provided for those working in essential
 457 services. Informal public transport operators were banned from operating during lockdown. This
 458 delayed HCWs' arrival at work and affected clinic opening and closing times, thus further reducing the
 459 number of women seen per day. Frequent and often impassable police roadblocks/checkpoints
 460 compounded these issues.

461 *"Transport was a nightmare because there was so much pressure at the ZUPCO buses. You*
 462 *wait at the bus stop for 3 hours waiting for ZUPCO and you will get to work at 9 am and even*
 463 *going back home, it was the same so because of the shortage of transport so we were now*
 464 *working till 2pm so that we will have time to look for transport and get home before curfew*
 465 *time" (HCW 5).*

466 Despite inadequate PPE, severe staff shortages and the increased workloads, HCWs tried their best
467 to provide services. Interviewed HCWs narrated how they devised ways to escape police roadblocks
468 so that they could get to work on time.

469 *"The police roadblocks were too many and quite frustrating I remember one day I was not*
470 *allowed to pass even after telling them that I was a midwife. Its fortunate that I was driving,*
471 *and I had to find an alternative route to get to work. Others on public transport had challenges*
472 *sometimes they would just call to say I was not allowed to pass by the police and one person*
473 *will attend to all the mothers which was very stressful" (HCW 9).*

474 By the time of follow up interviews, services were starting to normalise, for example, HCWs reported
475 that ANC contacts at their clinics had gone back to the recommended number and enhanced
476 adherence counselling and viral load monitoring for women living with HIV infection had resumed.
477 HCWs commented that the establishment of clear COVID -19 guidelines and standard operating
478 protocols (SOPs) for infection prevention saw improvements in services provision and in the
479 availability of PPE and the development of safety precautions. These improvements allowed
480 resumption of the recommended ANC services. HCWs stated that they had undergone a number of
481 trainings in the interim which improved their preparedness and safety. However, services such as
482 physical examinations and infant growth monitoring were still suspended.

483 **Discussion**

This study assessed the consequences of COVID-19 pandemic and associated measures on the uptake and provision of PMTCT services in two clinics in Harare, Zimbabwe. The study confirmed that provision of essential PMTCT services was disrupted mostly during the peak of the first COVID-19 wave. The study highlighted the fear of COVID-19 infection and fear of inadvertent HIV status disclosure and loss of income limited uptake of PMTCT services during the COVID-19 pandemic. At the facility level closure of clinics, staff shortages in part due to disruption in availability of public transport, reduced clinic operating times and number of patients seen per day and ultimately the uptake of services.

Pregnant and breastfeeding mothers stopped using healthcare services for fear of contracting infection or putting their families at risk. They worried that their healthcare facilities lacked capacity to manage people who got sick with COVID-19 infection and therefore wanted to avoid infection at all cost. This mirrors findings from other studies in Zimbabwe, South Africa, Liberia, Malawi, and Sierra Leone which also reported significant declines in the uptake of healthcare services due to fear of infection [4, 25-27]. An audit at central hospitals in Zimbabwe conducted in August 2020 found reduced utilisation of maternity services and a trend towards an increase in maternal mortality [2, 4]. In South Africa and Zambia, and Uganda fear of exposure to the SARS-CoV-2 prevented women from seeking healthcare services [26]. As a result, maternal and child health indicators worsened substantially during the COVID-19 pandemic. Our findings suggested that the fear was worsened by the limited knowledge about the infection, highlighting the need to invest in provision of timely accurate information to reassure the public and importance of accessing essential lifesaving services

such as PMTCT. As part of this project, we developed and disseminated educational materials for pregnant women, their families and HCWs to mitigate the impact of COVID-19 on PMTCT services and uptake.

The study found that women had reduced access to the eight recommended antenatal care contact visits with the majority only being able to access two contact visits. Women struggled to register their pregnancies on time as clinics were either closed or had shortened operating hours. Poor emergency preparedness saw maternity clinics across the country closing including referral hospitals [2, 4] thereby limiting women's access to services. We found that depending on timing, some women failed to register their pregnancy within the recommended 12 weeks of gestation despite having the registration fees, with two women having their first contact already in labour. This is in line with our quantitative findings which showed a substantial drop in initial ANC bookings early in the pandemic, although this subsequently recovered to pre-pandemic levels [23]. Fewer women receiving repeat HIV testing in pregnancy, which may have been because they had fewer contact visits. Late pregnancy registration has been shown to delay ART initiation for women who test HIV positive and are ART naïve. Delayed ART initiation, poor viral load monitoring during pregnancy and limited pre and postnatal follow up lead to high attrition in PMTCT programmes [28, 29]. Studies conducted in Ethiopia [30], Ghana [31], Malawi [32] and Zimbabwe [28] showed that where there was low retention in the first six months in PMTCT programmes there have been higher HIV transmissions.

Analysis of the PMTCT cascade demonstrates that HIV transmission rates are driven by mother-infant pairs who fall out of the cascade at later stages [33, 34]. In our study some women had to give

524 birth at home due to clinic closures and their HIV-exposed babies missed out on ARV prophylaxis and

525 HIV testing which again increased the risk of MTCT. The quantitative findings show a reduction in the

526 number of infants who received HIV testing from 27% to 18% during COVID-19 [23]. The gaps

527 healthcare workers described in the provision of PMTCT services due to COVID-19 appear to have

528 increased the rate of MTCT as HCWs are beginning to pick babies who are seroconverting. In

529 Zimbabwe the success of PMTCT programs has always leveraged on high ANC contact visits and

530 facility-based deliveries which mean a reduction in contact visits and facility based is likely to increase

531 the risk of transmission. The findings point to the need to invest in robust health-systems that respond

532 to emergency situations and ensure continuity of services for women throughout pregnancy and

533 breastfeeding [28].

534 Despite the challenges both women and HCWs were very resourceful. At least some women were

535 able to navigate the difficulties in accessing services. The HCWs we spoke to did their best to provide

536 services under difficult circumstances. Despite their fears of COVID-19 infection, colleagues testing

537 positive, limited PPE and transport challenges HCWs came up with strategies to continue service

538 provision. A number of studies have highlight HCWs being very resourceful in emergency situations.

539 In West Africa HCWs worked hard to provide healthcare services during the Ebola outbreaks despite

540 being at highest risk of contracting the Ebola virus [35, 36].

541 The findings highlight the need for creating public awareness on the importance of seeking health

542 services before introducing stern preventive measures that has a potential to limit access to

543 healthcare services. Introduction of national lockdowns must be preceded with awareness campaign

through a number of platforms to educate both the literate and illiterate members of the public on how to access services and the precautionary measures to take. Further research is needed to understand whether health care services have recovered to pre-pandemic levels and, if not, in which areas in order to inform MoHCC on areas that need further support.

Conclusion

The COVID-19 pandemic disrupted provision and uptake of PMTCT services in two clinics in Harare, Zimbabwe. Antenatal care contact visits were significantly reduced, some women were being forced to give birth at home and their babies subsequently did not receiving the necessary ART prophylaxis. These findings have shown the importance of investing in robust health-systems that respond to emergency situations while ensuring continuity of provision of essential HIV prevention, treatment, and care services.

Competing interests

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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