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REPORT

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The effects of COVID-19 on maternal, newborn and child health services in Papua New Guinea

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ABSTRACT

Papua New Guinea's health system faces ongoing challenges in the provision of maternal and child health and has some of the poorest health indicators in the world. In this paper, we describe the impact of COVID-19 on maternal and child health, as examples of primary health care services. We conducted 131 semi-structured interviews with different population groups in seven provinces (Jul–Nov 2021). A deductive analysis focused on identifying the impact of COVID-19 using the World Health Organization building blocks framework. An inductive analysis explored these impacts for maternal and child health services specifically. We identified three broad themes: service disruption, challenges in access to care and service provision. Service disruption included the closure, suspension and relocation of services and workforce challenges due to healthcare worker absences, redeployment and working within an already constrained health system. Access to care was difficult due to lockdowns and restricted movement. Service provision continued despite the fear staff had of COVID-19. Investing in pandemic preparedness, including an adequately trained and resourced healthcare workforce and facilities able to withstand sustained provision of essential services should be integrated with locally appropriate, and timely community-based information to allay fears and mistrust within the healthcare system.

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Introduction

In March 2020, the World Health Organization declared the novel coronavirus (COVID-19) outbreak a global pandemic (World Health Organization, 2020a). By the following year, there were 87 million reported cases of COVID-19 and almost two million deaths globally (Ahmed et al., 2021). The initial global response to the COVID-19 pandemic centred around extensive lockdowns and physical distancing whilst aiming to maintain essential healthcare (Cash & Patel, 2020). The pandemic challenged the resilience of even the most effective health systems. While the provision of

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health care was adapted to focus on managing people with COVID-19 and prevent further transmission, this strategy severely disrupted the provision of health services and within the first few months of the pandemic, widespread disruptions to antenatal care services, facility births and other essential health services were reported (World Health Organization, 2020b)

A low-middle-income country (LMIC) in the Western Pacific, Papua New Guinea (PNG) is culturally, linguistically and geographically diverse (United Nations, 2014). The majority (87%) of the 11.4 million people who live in PNG reside in rural and remote settings (Bourke & Allen, 2021). Access to health care across the country is limited by poor road infrastructure, mountainous terrain and hundreds of islands scattered beyond the mainland (Grundy et al., 2019). The terrain and remoteness make the delivery of and access to essential health services difficult (Bourke & Allen, 2021). In addition, PNG has a critical shortage of all healthcare workers with large gaps in the number and distribution of staff, particularly in primary-level care services (National Department of Health, 2021).

Prior to the COVID-19 pandemic, the PNG health system already faced significant challenges in the provision of essential health care, in particular, that relating to maternal, newborn and child health (Grundy et al., 2019). Maternal and newborn mortality indicators in PNG are one of the highest in the world: the maternal mortality ratio is estimated 145–434 maternal deaths per 100,000 live births (Kassebaum et al., 2014; National Statistical Office, 2019; UNICEF, 2021). The neonatal mortality rate is 22 per 1,000 live births; (UNICEF, 2021) and the stillbirth rate is 16.1 per 1,000 total births (National Statistical Office, 2019). In PNG around 47% of pregnant women attend antenatal services for care at least once in their pregnancy, and around 27% attend four times; only one-third of women give birth in a health facility (National Department of Health, 2021).

Following confirmation of the first positive case of COVID-19 in PNG, the National Government declared a state of emergency with an initial two-week nationwide lockdown on 23 March 2020. This lockdown was extended to June 2020 with restrictions on international and domestic travel mandated in July 2020. Following an increase in confirmed COVID-19 cases, mass gatherings were banned, attempts were made to restrict movement, night curfews were imposed, and non-essential services, such as markets, churches, schools, businesses and workplaces, were ordered to close (World Health Organization, 2022). The 'Niupela Pasin'(new ways of living) prevention and mitigation strategy was introduced in August 2020, to kerb increasing COVID-19 infections and ongoing transmission, including face mask mandates, social distancing and emphasis placed on hand hygiene. Over time, nationwide lockdowns were superseded by case-by-case lockdowns, especially following the identification of spikes in COVID-19 cases in specific provinces. Provincial border lockdowns, other movement restrictions and domestic flight bans were initiated during COVID-19 surges in 2021.

In light of the ongoing pandemic in a country whose health system was ill prepared and already stretched, (UNFPA., WHO., & UNICEF., 2019) the WHO PNG Country Office commissioned a study to investigate the impacts of COVID-19 on primary health services and public health infectious disease programmes in PNG (Newland et al., 2022). The aim of this paper is to describe the impact of COVID-19 on maternal and child health, as examples of primary health care services.

Methods

A qualitative study was undertaken between July and November 2021 across seven provinces in PNG: the Eastern Highlands, East New Britain, Madang, Morobe, Western Highlands and Western Province, and the National Capital District. Provinces were selected in collaboration with WHO to reflect provinces with present or past high rates of COVID infection as well as those of geographical importance in disease transmission (port, national capital and international borders). Within each province, a provincial hospital and another health service setting was chosen to reflect and attend to capturing diverse data from the different public and primary health focuses (maternal and child HIV, TB, malaria). The final study sites and settings were decided as part of a collaborative-based approach between the research team, the WHO PNG, and Provincial Health Authorities in PNG.

Semi-structured interviews were conducted with five different population groups recruited through health facilities: community members; health care workers; men and women who were accessing or not accessing care, including maternal and child health services, and key informants. Key informants included those working in District, Provincial and National Health Departments and/or individuals with policy influence. Snowball sampling recruitment techniques were used, whereby trusted people such as health care workers, health programme managers, and officials from provincial health authorities helped to facilitate contact between potential study participants and the research team. This was particularly the case for clients and key community stakeholders. Healthcare workers and key informants were directly approached by members of the research team to participate.

Interviews were conducted by trained social researchers from the Papua New Gunea Institute of Medical Research (PNGIMR) (NN, AKM, ZK, RBN, HA, RNT) and were completed following informed consent procedures. All researchers involved in data collection were highly experienced and trained Papua New Guinean researchers who had worked on social research studies of infectious and vector-borne diseases, maternal health, and health system research. To further ensure the quality of data, all researchers were trained in the research protocol and data collection tools prior to fieldwork. Information and consent forms were provided in English and Tok Pisin and explained verbally to all participants. All questions were addressed by the researcher prior to all participants agreeing to participate and providing written informed consent.

All interviews were conducted face to face, took between 50 and 90 min and were digitally audio-recorded, transcribed verbatim, translated from Tok Pisin to English where necessary and included in qualitative data analysis. Interview transcripts were stored, managed, and coded in the qualitative data management software program, NVivo version 12 (QSR International Pty Ltd).

Analysis of data used deductive and inductive thematic analysis (Braun & Clarke, 2006). Deductive analysis was undertaken by one researcher (JN) and focused on identifying the impact of COVID-19 on primary and public health using an amended WHO building blocks framework (De Savigny & Adam, 2009; World Health Organization, 2010). At this time, cases for analysis were also developed to capture these key domains across the different public health and primary health focuses, including maternal and child health. Code books were produced for each public health and primary health focus and were structured thematically to manage project data reporting on the different building block domains. These code books were discussed and re-read by authors (add initials of all authors) to cross-check codes, analysis and interpretation of the data and to review findings across the diverse building blocks and between the diverse public and primary health service modalities.

Further deductive analysis was undertaken on the eight building blocks by members of the research team (JN, NN, LV, RF), co-analysing the relationships and links both within and between the different building blocks to form a reflexive analysis (Braun & Clarke, 2019).

Inductive analysis for this paper explored these impacts across the building blocks in relation to maternal and child health services. Pseudonyms are used throughout this paper to ensure confidentiality and anonymity of participants.

Ethical clearance was obtained from the PNGIMR Institutional Review Board (IRB #2015), the PNG Medical Research Advisory Committee (MRAC 20.35) and UNSW Sydney's Human Research Ethics Committee (HC210172). Each of the seven study provinces provided authorisation through the governing provincial health authority body prior to the research being conducted.

Results

Semi-structured interviews were conducted with 131 individuals from five population groups in eight sites across the seven provinces (Table 1). Participants included healthcare workers (n = 56), key informants (n = 8), community members and leaders (n = 25), and men and women who did (n = 29) or did not attend for care (n = 13) during the COVID-19 period. Among those

Table 1. Semi-structured interviews by population group.

	EHP	WP	NCD	ENB	MAD	MOR	WHP	Total
Health care worker	10	18	4	9	6	3	6	**56**
Key informants	2	1	1	1	1	1	1	**8**
Community members	3	5	4	3	4	4	2	**25**
Clients – Attending services	4	5	5	4	2	5	4	**29**
Clients – Not attending services	3	3	1	1	0	4	1	**13**
Total	**22**	**32**	**15**	**18**	**13**	**17**	**14**	**131**

attending services, seven were attending maternal and child health (MCH) services and six were not engaged in MCH services. These six participants were included in the study to ensure we captured the rich and complex experiences and impacts of COVID-19 in health service delivery and utilisation, including disengaging from primary health services.

Abbreviations: EHP – Eastern Highlands Province, WP – Western Province, NCD – National Capital District, ENB – East New Britain, MAD – Madang Province, MOR – Morobe, WHP – Western Highlands Province.

Three broad themes were identified: service disruption, challenges in access to care and service provision.

Service disruption

Disruptions to services included the closure, suspension and relocation of some essential services and adaptations to the usual management of services. Other workforce-related disruptions included healthcare worker absences due to COVID-19 infection, redeployment of staff, working within an already constrained health system and the impact of COVID-19 on an aging workforce.

Closure and suspension of services

The closure, suspension, and/or disruption of services due to lockdown restrictions was described by healthcare workers, in particular the closure of childhood immunisation and some antenatal services. Some centres reported focusing on providing COVID-19 vaccinations, in addition to outpatient services.

> … we did have many changes during the period of COVID-19 … when COVID-19 came in, we shut down. We completely shut down all our immunisation programs, antenatal programs and family planning programs … and we only catered for the COVID-19 vaccination plus the outpatient.
>
> Morris, Health Care Worker, MCH provincial urban clinic, Morobe

> … September last year [2020], we resumed again because during that shutdown, they said that we are not supposed to have any gatherings … when we go out for the MCH clinic or the integrated clinics, the crowd would gather. So [ ] we didn't go out … in September, we started up again until … April [2021] we did the school medical and now we are going back again to our normal routines.
>
> Lola, TB/HIV Officer in charge, District Rural Hospital, East New Britain

In one setting, disruptions to the prevention of mother-to-child transmission of HIV services were a particular concern, highlighting the intersection between maternal and child services and public health ones. The disruptions caused by lockdowns and changes in clinics meant some women with HIV were not able to access HIV treatment for themselves and their babies, creating a disconnect between antenatal care and HIV.

> But currently, there are laws [COVID-19 rules] too are there and most are not on; not many but few are not on ART. They just went lost to follow and they are delivering their babies without. When they are pregnant, they got their babies without ART.
>
> Annie, F49, HCW (CHW), Provincial Day Clinic, HIV, Eastern Highlands

In some situations, to avoid over-crowding and to manage the number of service users, women attending for antenatal care were asked to return at a later date. This meant some had a delay in access to their first antenatal assessment, as Vero explains:

> Because of COVID-19 we go to and fro, they send us home and it was July 2nd [2020] that was the first time I went inside the clinic. I went early and there were not many mothers present then so I went inside to check the baby's status in the clinic. The first time when we wanted to go inside, they said it was COVID-19 and they removed those of us who went. That was the first time I went, when I was seven months [pregnant].
>
> Vero, antenatal attender, Urban Hospital, Eastern Highlands Provincial

Relocations and adaptations of services

In some provinces, patient pathways were re-designed, even relocated, to reduce the risk of infection by minimising contact of people suspected of having COVID-19 with general outpatient and in-patient services. In the Eastern Highlands Province, the space usually allocated to provide family planning and well-baby clinics was re-organised to provide COVID-19 services. In addition, rather than all of these services being delivered at one clinic, some services were moved to different urban clinics in other areas of the town. For example, while family planning was relocated to a clinic a short walk from the hospital, the paediatric HIV service, usually provided as part of the well-baby clinic, was moved to an urban clinic far from the hospital. These moves resulted not only in confusion for service users but significant flow-on effects for users deciding when or even whether to attend due to uncertainty around if the clinic would be open. Additional costs and availability of transport also impacted the decision to attend, as Benita describes:

> … especially when COVID-19 came, it took over the Family Planning Services building and the Children's Clinic, and then … they changed the venues site to [clinic name], so the mothers are confused [of where] to come and access these services. So, we [are]concerned that Family Planning drops, immunisation drops, also antenatal is dropping, these are now our concern now … how will we help them again, or how will they come? Maybe this COVID-19 has caused them to be afraid to come and get the medicines, we don't know …
>
> Benita, Health Care Worker, Provincial urban hospital, Eastern Highlands Province

Concerned for the safety of women and babies in their facilities, many healthcare workers continued to provide care for women by adapting the management and usual 'flow' of antenatal care services. For example, women were asked to wait outside until they were called into the clinics. In this way, staff were able to restrict the number of people inside the building at any one time, as Sonia explains:

> … they are all outside and we call like five (5) at a time in and once we've done with that five (5), we call another five (5) That's how we are doing it now. Previously we had all of them coming in sitting around and we call them …
>
> Sonia, Clinic nurse manager Peri-Urban clinic, Western Highlands Province

Some of the adaptions created other challenges. For example, women attending antenatal care in at least one province described new arrangements whereby they were required to wait for appointments alongside those waiting to be seen at the TB clinic, including people who were infectious. Gina explained how this change affected her care:

> [ ] they used to separate the pregnant mothers … but when COVID-19 came, they sent us the pregnant mothers to go with the TB patients on this side. So, we used to come and mix up with the TB patients and sit. And then now, they send the pregnant mothers back again. They set up a tent and have put a canvas there, so they put us there … They said there was no space for us to go and sit there … Our space was taken up by the COVID-19 patients, so they sent us back here.
>
> Gina, antenatal clinic attender, Urban clinic, Morobe Province

Absence of healthcare workers

Other disruptions to services were due to a lack of staff at the facilities and occurred in the context of an already constrained and aging health workforce. Compounding the problem of staff shortages was the redistribution and redeployment of staff within facilities and provinces to provide support to the triage and testing of COVID-19, and to support surveillance activities. In some sites highly trained staff, including family planning nurses and midwives, were sought to undertake COVID-19 training and subsequently deployed to the pandemic response. Redistribution and redeployment resulted in reduced staffing levels in key areas such as antenatal clinic, immunisation and family planning programmes:

> When they pulled us out, the staff strength went down. So, when the patients came to the health centre, those poor remaining staff had a bit of hard time working because their staff strength was down …
>
> Tobras, Health Care Worker, General nurse, District rural hospital, East New Britain

While the depleted workforce was a health system issue that existed prior to the pandemic, it was compounded during it by the lack of staff not in attendance at work. This was a particular concern for older members of the workforce who were seen to be more at risk from becoming infected, knowing that COVID-19 more frequently resulted in poorer health outcomes, including mortality. In considering this, a few health services strategised how to best protect and prevent infection in older healthcare workers. Strategies included staff over the age of 55 years being advised not to come into the health facility, or in some sites older members of staff were assigned roles and responsibilities away from public areas and direct clinical care, where the risk of COVID-19 infection was greatest, as Peter describes below. The option to stay at home was offered in at least two different provinces, with some older healthcare workers choosing not to return to the workplace after the initial lockdowns.

> The concern raised [about our aging workforce and COVID-19 risk] and we told them, yes; we didn't tell them to stay home, but we redirected them away from too many contacts with patients, so we put them in places where there are less contacts …
>
> Peter, Key Informant, Provincial Health Authority, Western Province

Challenges in accessing care

A number of factors influencing access to care were identified by both healthcare workers and service users, including restricted movements exacerbated by limited public transport and fear of COVID-19.

Restricted movements exacerbated by limited public transport

An already constrained workforce was further impacted by community lockdowns. Restrictions on movement and a reduction in public transport (the primary form of transport in PNG) meant healthcare workers were unable to attend work. When public transport was available restrictions in passenger numbers meant people often had to wait for another bus, affecting both engagement in services (as Albert describes below), but also impacting staff arrival times at facilities, interrupting shift turnover and the opening of services. At times, transport-related delays and staff shortages caused friction between staff, leaving patients waiting for care, as Flora describes.

> … the lockdown itself has actually restricted transport, restricted people movement and pregnant women were not able to come to antenatal care.
>
> Albert, Health Care Worker, Provincial Health Authority, Madang Province.

> … the night shift nurses they continue working right until the morning staff … there's a lot of, argument amongst themselves due to lateness where the nursing officer on duty will say, 'I am due for the shift but you didn't make it on time and I am filling-in for you'. Sometimes the patients become the victims as the

nurse [on duty] would say, 'this is not my shift, you have to wait for that particular nurse as it is her shift so in the meantime you can sit down and wait until she comes in'.

Flora, Engaged client/support worker MCH, Catholic Urban Health Service East New Britain

Fear of COVID-19

From the perspective of service users, fear of contracting COVID-19 while attending facilities was evident. This was due in part to misunderstanding, confusion and mistrust of information. Among service users and healthcare workers, fear of contracting COVID-19 impacted both the uptake of care and provision of care for those who attended services.

Across all study sites health facilities were viewed as sites of COVID-19 risk. Perception of risk was exacerbated by over-crowding and poor adherence to COVID-19 precautions, for example wearing masks and social distancing. Participants unanimously reported that this led some to avoid attending health facilities, particularly antenatal and immunisation services.

Despite genuine concerns about the risk of COVID-19 from attending the health facility, a few healthcare workers described how women were still attending for antenatal care realising the importance of regular reviews and management during pregnancy. Likewise, some women reported attending services despite their concerns and feelings of mistrust, to ensure all was well with themselves and their unborn baby, as Gina discussed:

… the first time I came to the clinic, they talked about COVID-19, and I was also scared to come to the clinic. I said, 'if we go, they might falsely use the name of the injection or something like that and give us the COVID-19 injection (vaccine).' So, I was scared, and I stayed until I made the decision myself … I said COVID-19 is here but the important thing is, I go and get the medication. I go check-up and know how the baby is and the nurses would tell me that my baby is fine.

Gina, antenatal attender, Urban clinic Morobe Province

Service provision

The ongoing provision of services during the COVID-19 situation was reported by some healthcare workers. Fear of contracting COVID-19 in the workplace was a concern, with some continuing to provide care despite their fear, but others refusing to care for patients with COVID-19. Provision of routine vaccination services and community mistrust of the COVID-19 vaccination was also discussed.

Fear of COVID-19 in the workplace

Despite many healthcare workers holding the same fears (and misconceptions) of COVID-19 as others in their communities, the fact that health services continued in PNG during the pandemic, including during surges, shows the level of commitment and dedication many of them have. In considering their role as a health care workers some participants spoke of health staff not only afraid of contracting COVID-19 but also of healthcare-associated transmission – the passing of COVID-19 onto patients under their care. This was particularly so when staff were being moved to different departments, wards and services within a facility, as Lenora describes:

… infection was coming up here, it was rising and then into the ward. Patients were going down and then we were just infecting each other … . Doctors were infected as well because during rounds, being with the patients and the nurses … masking was not really taken on onboard. But then not long after that, everyone falls, they all fall with the illness. … anyone presenting with any cough, flu symptoms, we were pulling them out from the workforce, pushing them in for testing.

Lenora, Director of Nursing, Catholic Peri-Urban Hospital East New Britain.

Among healthcare workers there was concern about working during the pandemic, with staff afraid of contracting COVID-19 while at work, being scared for themselves becoming sick as well as taking

the infection back to their homes. One participant reported a nurse refusing to provide essential treatment to child for fear of contracting COVID-19.

> [the] health care worker is refusing to give the intravenous chloramphenicol, so the specialist had to come and give it up until 10pm … , and said, 'I'm giving her 10pm injection, you people continue and give it at 4am.' When she came on in the morning, the 4am [injection] was not given … I'm a family person, I don't want to take COVID-19 and go and give it to my children,' you know this kind of understanding.
>
> Bernie, Health Care Worker, MCH, Provincial Urban Hospital, Eastern Highlands Province.

Healthcare workers described that, while health staff attended for work at their respective facilities, some refused to be involved in the care of people with COVID-19 claiming that they were not trained or adequately provided with personal protective equipment to do so. As Clarise describes below, there was a general feeling among healthcare workers that only those who had attended specific training regarding how to identify and manage people with COVID-19 should be involved in their care.

> It is still a problem because some didn't [attend] in this training and if a patient comes in and they suspect them with COVID-19, they would say, 'Look for the ones who were in training … ' but most of the nurses are scared and they ran away. They locked themselves and stayed. So, I see that this will still be a problem, if there is an outbreak. If we detect some positive cases most of the nurses will run away and they wouldn't attend to the patients.
>
> Clarise, Health Care Worker, Provincial Rural Hospital, East New Britain.

Vaccination services

Misconceptions about the availability of the COVID-19 vaccine created some misunderstanding and confusion in the community. Among both healthcare workers and service users (engaged and non-engaged) there was a widespread feeling of mistrust in relation to misinformation being given about COVID-19 and the COVID-19 vaccine, with clear implications for engagement with childhood immunisation programmes.

> They [the community members] always scare us … They say, don't go to the hospital. At the hospital they tell lies, and they will give you the injection for this Coronavirus'. Then some people fear coming [to hospital].
>
> Molina, TB engaged client, Urban Hospital, Eastern Highlands Province.

Misunderstandings relating to health information surrounding the COVID-19 vaccine at the community level left some members of the community believing that their babies would be vaccinated against COVID-19 as part of the routine childhood immunisation programmes. In at least one other setting the confusion of routine services, in this case, the routine vaccination of school children with a tetanus toxoid booster, led to a confrontation between parents and their children. The reality was, in PNG, that the COVID-19 vaccine was (and continues to be) only provided to those aged 18 years and over.

> Some female health workers went out to give normal vaccination for the children. They went up to a village … The health workers gave tetanus toxoid to the school children [ ]. But the parents misinterpreted, thinking it was the COVID-19 vaccination and following this misinformation, some [parents] beat their children.
>
> Tobras, Health Care Worker, General nurse, District rural hospital, East New Britain

Fear of the COVID-19 vaccine was linked to unknown side effects of the vaccine but also with some members of the community believing that individuals were being injected with COVID-19 itself (and not the vaccine). In another setting, a story emerged of a father destroying nutritional supplements meant for his infant as he believed the supplement contained COVID-19, further displaying the widespread mistrust many in the community had of healthcare workers and their care. Mothers were described as 'running away' from outreach childhood immunisation programmes and the COVID-19 vaccine being linked to '666' – the devil.

Discussion

This paper reports on the single largest qualitative study undertaken on COVID-19 in PNG, particularly as it relates to access to maternal and child services and service provision in the context of the COVID-19 pandemic. Widespread disruptions to services were reported and numerous adaptations were made to ensure the continuation of maternal and child health services in what were unprecedented times in PNG, and the globe more generally. Relating to service provision, participants discussed the difficulty in accessing services and uncertainty surrounding the availability of services during the pandemic, particularly due to lockdowns, fear and mistrust of attending services and receiving care. Others chose to disengage from maternal and child services during these times. Healthcare workers also discussed their concerns and difficulty in providing appropriate care, constrained by a lack of training and human resources and their own fear of the virus, which occurred against a backdrop of a depleted workforce.

Disruptions to services were a cause of concern for both those providing care and those wishing to access care. To continue to provide, albeit modified, maternal and child health services, healthcare workers described several adaptations, including the suspension and relocation of some essential services, and adaptations at others. While the relocation of key services and the routine provision of services, such as antenatal care and well-baby clinics caused confusion for women and caregivers, it allowed the provision of essential care in a safer environment that attempted to protect the healthcare workers themselves, pregnant women, caregivers and children. This adaptation of routine services was not unique to PNG; it was reported in many low-and middle-income countries. For example, in Nigeria, antenatal care appointments were staggered to reduce the number of women attending the facility at any one time (Balogun et al., 2022). In our study, compounding the disruption to maternal and child health services was the redistribution and redeployment of healthcare workers, a finding similar to that reported in a recent scoping review from 58 countries across five WHO regions describing human resource deployment as a key factor negatively impacting childhood vaccination programmes (Dalton et al., 2023).

Accessing maternal and child health services was further impacted by COVID-19 lockdowns and poor awareness of the availability of ongoing essential services, at the community level. The impact of lockdowns affecting access to care has been reported elsewhere, including Nigeria (Akaba et al., 2022; Balogun et al., 2021) and Ethiopia (Tilahun et al., 2022) and are reported in a WHO survey of 105 countries across five WHO regions (World Health Organization, 2020b), noting that reproductive and maternal and newborn health services were particularly affected. A systematic review conducted in Ethiopia to summarise the extent of disruptions to maternal health services also noted disruptions to antenatal care, facility births and family planning services (Zewdie et al., 2022).

As was the case in our study, findings from elsewhere have shown that fear of being infected with COVID-19 and imposed restrictions on movements had an impact on receiving care (Akaba et al., 2022; Balogun et al., 2021; Tilahun et al., 2022). In our study, healthcare workers and key informants noted a reduction in attendance for antenatal services, including women turned away from antenatal care, and being asked to return at a later date. National health systems data for PNG during 2021 reported a drop in antenatal visits for one and four visits, and a drop in health facility births, with only 32% of women attending for a health facility birth, compared to 36% in 2020 (National Department of Health, 2024). In a country with an already low uptake of maternal health care, this placed women and their newborns at an increased risk during an extraordinary period of time.

Reduced attendance for services was felt to be due to not only a lack of information and awareness at the community level of the availability of ongoing services but also due to mistrust and fear among women and the community more broadly. Poor messaging and fear of exposure to COVID-19 were reported to be a key factor impacting childhood immunisation programmes and other health services in a number of countries during the height of the pandemic (Ahmed et al., 2021; Akaba et al., 2022; Balogun et al., 2021; Dalton et al., 2023; Goyal et al., 2021; Harris et al., 2021; World Health Organization, 2020b).

In our study, healthcare workers reported feeling afraid of contracting COVID-19 while in the workplace with fear at times leading to a reluctance to attend work or to treat COVID-19-positive patients. Studies from Malawi (Odenigbo & Crighton, 2023) and Nigeria (Bello et al., 2024) report similar findings, with fear of COVID-19 associated with reduced attendance at work, or staff not being committed to their work. In a study conducted in Brussels, Moretti and colleagues (Moretti et al., 2022) report a link between fear of COVID-19 and reduced motivation to work, and highlight that with increased knowledge and appropriate provision of personal protective equipment, these can be reversed.

Whilst there is little evidence of people specifically avoiding maternal health services due to the fear of COVID-19 transmission from health workers (the fear of health workers), an increasing literature base reports on this phenomenon more generally (Dye et al., 2020; Taylor et al., 2020). A phenomenon is also reported in healthcare workers themselves fearing the transmission from other healthcare workers (Schubert et al., 2021). These findings are particularly pertinent for client engagement and workforce planning during future pandemics. Particularly for maternal and child health sectors, where still little is known.

Earlier work in PNG on willingness to collect specimens for COVID-19 testing using a mixed-methods approach of 19 interviews with key stakeholders and a phone survey of 407 healthcare workers from across PNG, identified that lack of personal protective equipment, inadequate staffing levels and a general lack of preparedness of staff at the facilities influenced the provision of services during COVID-19 (Smaghi et al., 2021). Similarly, a rapid appraisal conducted in the UK at the height of the COVID-19 pandemic reports a lack of training and insufficient supplies of personal protective equipment among healthcare workers, leaving them concerned and at risk of contracting COVID-19 (Vindrola-Padros et al., 2020).

We collected data for our study from July to November 2021 coinciding with the third, and largest, wave of COVID-19 seen in PNG. Therefore, our findings report on the impact of COVID-19 at a specific time and in specific places and may not be generalisable to other provinces in PNG or to the same provinces at different time points during the pandemic. Our engagement with participants in the community was limited due to COVID-19 restrictions, therefore we are limited in our understanding of the extent to why some chose not to access health services during this time. Much of our data describing access to health care and engagement/ disengagement with care is from the perspective of the health care workers.

Our study is the single, largest qualitative study conducted in PNG on the COVID-19 pandemic and was conducted in high-impact provinces. It, therefore, has several strengths, including the involvement of key healthcare workers and policy and programme managers, in addition to women and the wider community. The study was conducted in eight facilities in seven provinces providing a broad oversight of different geographical locations. These findings showed many similar impacts and experiences within diverse geographies, varied health services and facilities, and across primary health and infectious disease programmes.

Conclusion

Access to health facilities, disrupted services and provision of health care impacted the uptake of essential maternal and child health services during the COVID-19 pandemic in PNG. Fear and a lack of understanding and awareness among both those seeking and providing care led to delays in seeking timely maternal and child health services. Investing in pandemic preparedness that includes an adequately trained and resourced health care workforce and facilities able to withstand sustained provision of essential services should be integrated with locally appropriate and timely community-based information to allay fears and mistrust within the healthcare system.

Data availability statement

The data that support the findings of this study are available from the corresponding author, upon reasonable request.

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