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Full Length Research Article

IMPACT OF COVID-19 ON MATERNAL NEWBORN CHILD HEALTH SERVICES IN FEDERAL MEDICAL CENTRE GUSAU, ZAMFARA STATE

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ABSTRACT
Background: Infectious diseases have been a constant threat to people's health and survival, at least thirty re-emerging and emerging diseases (Parks,2009) are known to be of public health importance posing a burden to the health system; in addition, emergence of COVID-19 further tested the resilience of the health system to respond to public health emergencies (NCDC,2020). This study assessed the effect of COVID-19 on use of maternal and child health (MNCH) services with objectives being the impact on family planning use, antenatal care visits, facility-based delivery and child related services such as immunization, child nutrition and outpatient clinic in FMC Gusau. Data from units offering MNCH services for six months (three months pre-covid-19 index case (January to March) and three months post covid-19 index case (April to June), corresponding to the period of lockdown, in addition same periods in the previous year (2019) was retrieved and entered into Statically package for social sciences (SPSS) now IBM statistic, comparison was made using comparable period of the year as well as a pre and post Covid index case. Over the six-months period, aggregate data shows that hospital visit for all categories of maternal newborn and child health reduced three months (April, May and June) post covid index case in the facility and subsequent proclamation of lockdown in the State, as compared to three-months pre-covid (January, February and first three weeks of March) Despite the additional burden imposed by the emergence of COVID-19 in FMC Gusau and the Attendant stretched on health system, the resilience of the health system was brought to fore, however with support from Federal ministry of health, National Centre for disease control and other agencies, FMC Gusau was able to use the COVID-19 emergency to strengthen service provision.

Keywords: COVID-19, Pre-COVID-19 Index Case, Lockdown.

INTRODUCTION

Globally Infectious diseases have been a constant threat to people's health and survival, in the last 50 years, at least 30 re-emerging and emerging diseases are known to be of public health importance (Parks,2009). The variables responsible for this relates to the ease of interaction between agent, host and environment as seen in the process of urbanization, environmental changes, altered sexual relationship, intensified food production as well as increased mobility and trade (Anthony et al.,2007). Much need to be done with regards to the health seeking behaviour as evidenced by contraceptive prevalence rate of 5% delivery attended by health professionals of 22.3%, facility based delivery rates of 5%, 57.8% of women had no ANC, and only 29.0% had 4 or more ANC visits (MICS, 2018) Hospital record shows that on the average, about 300 women are seen weekly in the antenatal clinics, and about 250 deliveries are conducted monthly. Women from the locality favour home delivery for socio-cultural reasons and there is some aversion to caesarean section.

The Chinese health authorities raised Covid-19 alert on 31st December 2019 following a cohort of 27 Pneumonia like cases in the city of Wuhan, Hubei Province, China (WHO, 2020). Investigation later revealed the causative organism to be a novel coronavirus named severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (Haigiang et al., 2020). On March 11, 2020, the World Health Organization announced COVID-19 outbreak as a pandemic(Ahmed et al.,2020) .The disease is transmitted via Person-to-person transmission when two or more persons are in close contact with one another usually within 2 metres/6 feet, mainly through respiratory droplets and has an incubation period of 2-14 days (WHO,2020). The outbreak and subsequent measures taken affected women's access to life saving maternal and reproductive health services, coupled with fragile reproductive health system, which before the outbreak had significant weaknesses in its human resource, service delivery, demand and supply, medicine and technological capacities.

The index case of COVID-19 outbreak in Federal medical centre Gusau was reported on 27th March 2020, thereafter a lockdown of economic and social activities was declared in the State, this work aimed at assessing the effect of Covid-19 on maternal and child health services in Federal medical Centre Gusau Zamfara state following the lockdown.

MATERIALS AND METHODS:

The study was a mixed study that analysed routine retrospective hospital data in addition to qualitative component (key informant interviews) conducted amongst health care workers in the maternal, newborn and child health (MNCH) units (immunization, Nutrition, antenatal, labour room, family planning and pediatrics units.

Study population

The quantitative component involve comparison of routinely collected data from units and departments offering MNCH services from year 2019 to 2020 comparing the total number of admissions by corresponding period of the month (i.e. January to June).

The qualitative component involves collection of key information from heads of units delivering MNCH services in the hospital.

Inclusion/Exclusion Criteria: Heads of unit and departments involved in service delivery at MNCH units who gave consent were interviewed those who decline consent as well as those not available were excluded.

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Sampling
Purposive sampling method was used for the recruitment of participants /interviewees, collection of data was stopped when saturation was reached, that is when no new information was obtained by the researchers.

Study instruments:
Qualitative component: 15 Key informant interviews were conducted using a standard Covid – 19 key informant interview guide adapted from Ebola key informant interview guide (Ebola, 2021).
Quantitative component: Hospital data for service delivery statistics from MNCH units were collected across three time periods: three months before COVID-19 country wide lockdown, the period of the lockdown and three months post lockdown period. In addition service delivery statistics for the corresponding period of penultimate year (2019) was obtained and the result were then compared.

Data analysis
Quantitative data collation and editing was conducted manually to detect omissions and to ensure uniform coding. The data was then entered into a SPSS/ IBM (version 23); using table and chart where appropriate with comparison done pre-post covid index case in the hospital.
The qualitative data was collected using audio recorder, and later transcribed, this was analyzed based on thematic areas in relation to the outlined study objectives.

RESULTS:
Over the six-month period of the first wave of COVID-19, aggregate data shows that hospital visit for all categories of maternal newborn and child health reduced during the three months of lockdown (April to June 2020 as compared to three-months of pre-COVID index case in the hospital (January to march 2020) across all units and departments providing MNCH services (as seen in table 1).
Also, while there was no significant difference between the total admissions for the months of January to March of year 2019 compared to same periods of year 2020 this was not the case for the periods April to June 2019 compared to same periods of 2020. (Fig.1 to Fig.3)

Table 1 shows the total number of hospital visit recorded across categories of maternal newborn and child health unit in the period pre-covid-19 lockdown and COVID-19 lockdown period in Federal Medical Centre Gusau

UNIT	Pre-COVID-19 index case	COVID 19 Lockdown period
ANC	4,206	1,142
Immunization	3,822	2,429
Delivery	596	481
Postnatal	535	183
SCBU	285	155
PMW	273	192
p-value		.039

ANC=Antenatal Care
SCBU=Special Care baby unit
PMW: Paediatric Medical Ward

There was a statistical significant difference (P=0.039) between the cases seen during the pre-covid period compared to the lockdown period (at p=0.05 level of significance)
In specific terms, the number of pregnant women attending antenatal, delivery and postnatal services in the three months preceding lockdown as compared to three months of lockdown is shown in fig. 1, Fig.2 and Fig.3 respectively.

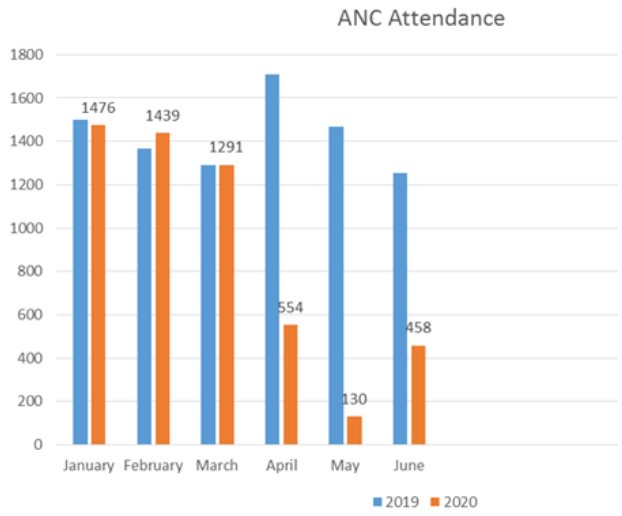

Fig 1: ANC attendance by Month Pre and during Covid-19 Lockdown and Year on Year comparison by Month during same Period

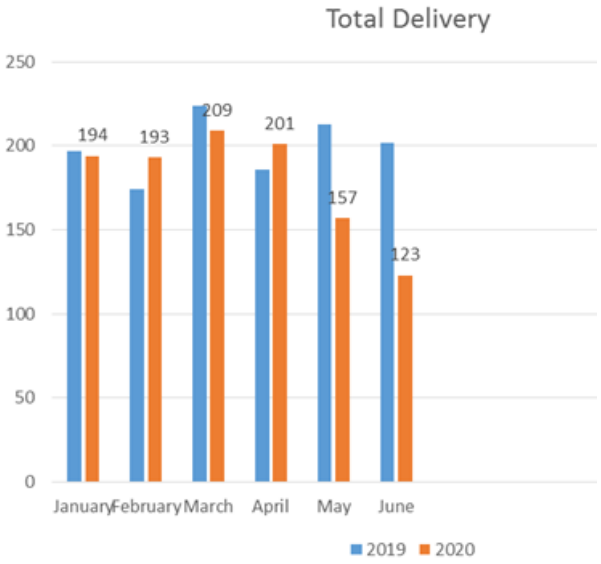

Fig 2: Total delivery by Month, Pre and during Covid Lockdown and Year on Year comparison by Month during same Period

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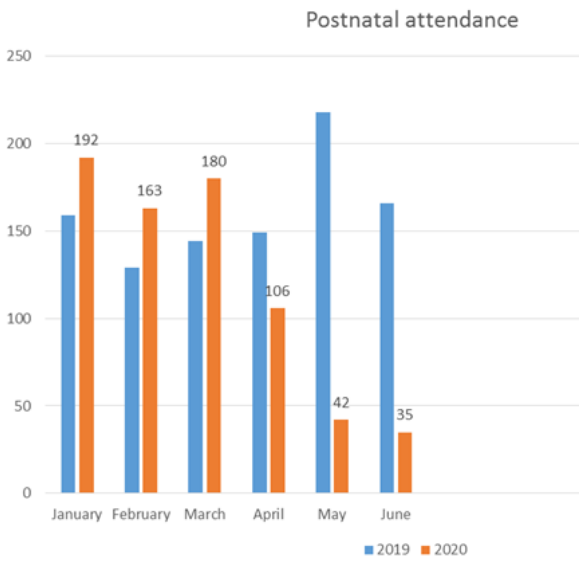

Fig 3: Postnatal attendance by Month Pre and during Covid Lockdown and Year on Year comparison by Month during same Period

Immunization data also shows a consistent decrease in the three months preceding the outbreak of covid-19 in the state as shown below:

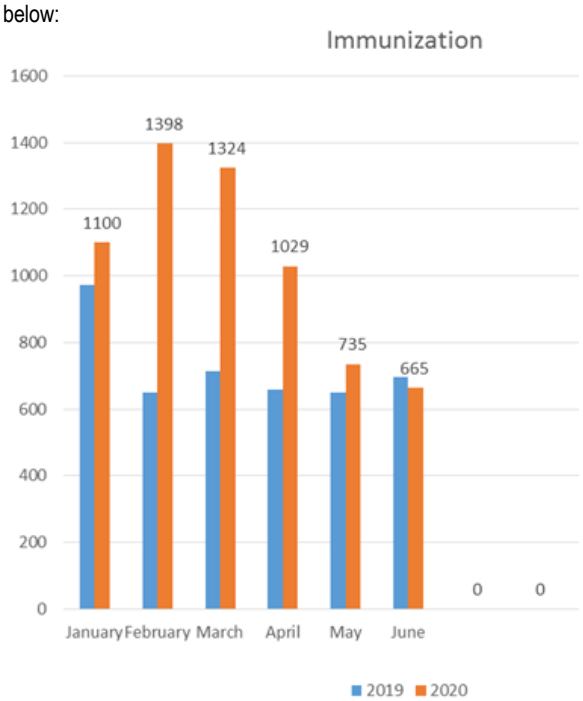

Fig 4: Immunisation attendance by Month Pre and during Covid Lockdown and Year on Year comparison by Month during same Period

The special care baby unit (SCBU) also shows same pattern of outcome as seen in the previous categories where patient inflow was clearly less in the three months of covid lockdown as compared to three months pre-COVID lockdown as shown in the Figure 6 below

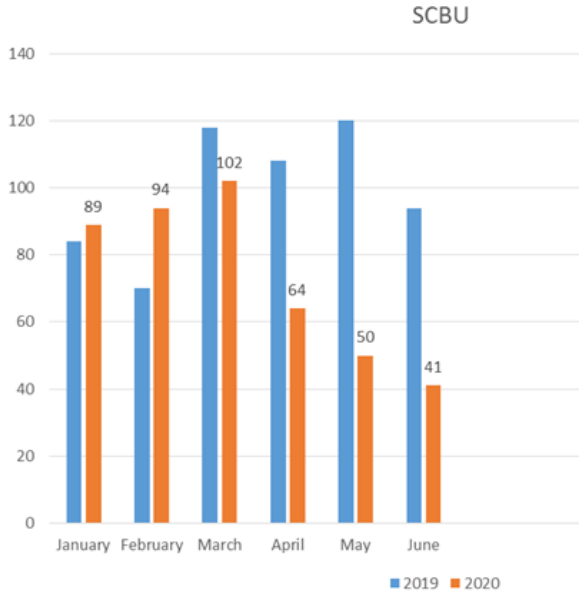

Fig. 5: SCBU attendance by Month Pre and during Covid Lockdown and Year on Year comparison by Month during same Period

Qualitative result

Opinion of senior health workers including principal medical officers, chief nursing officers, principal nursing officers and nutrition officers (in charge of maternal child and newborn services including nutrition) was sought on covid-19 outbreak and its effect in FMC Gusau, discussion bothered mostly on Covid -19 Outbreak, specific and general impact.

Three participants were responsible for providing direct care to patients during antenatal care, family planning and labour room, three provided services in peadiatric outpatient department, peadiatric emergency unit and special care baby unit while two provided care in the nutrition unit; the services provided by these personnel include promotive services such as health talk during antenatal and Family planning on exclusive and complementary breastfeeding, provision of preventive services such as Folic and fasolate supplementation, prophylactic services such as Fansidar to pregnant women during antenatal visit as well as use of Mosquito nets.

On the level of preparedness of the centre before the outbreak, the consensus amongst participants was that it was only optimum as there were hand washing points at entry and exit into the units and departments, use of face mask was made mandatory and screening of visitors was ensured at the entry into the hospital with capacity to service delivery reduced so as to only provide services for emergencies and priority cases only however the supply of these protective commodities was not regular as clients and patient would have to make purchases for sustainability of supply and usage.

Relating to COVID-19 personal experience, all participants agree there was palpable fear and panic in the facility during the immediate period following the index case in the facility, however this fear was progressively allayed with more awareness creation, sensitization and provision of personal protective equipment, less

than 20% of them reported going on quarantine as a result of contact with a confirmed patient while less that 10% were confirmed positive for Covid-19.

All participants except one agree services i.e. labour room were affected by the covid-19 epidemic, more specific is the fact that in family planning services only oral contraceptives were offered all injectable and implants procedures were suspended, routine immunization almost witnessed a sharp decrease in turn out, in paediatric outpatient department and paediatric emergency unit only skeletal services were offered this was also the case in the immunization unit, however the nutritional unit domiciled in the department of pediatrics was totally shot down, so service provision was not available during the period post the index case, all children malnourished in the emergency pediatrics unit and pediatric medical unit count get access to nutritional support services (fortified pap) during this period. No money was generated by the unit during the period of shot down. The food store of the unit was also affected as raw grains were also affected by rodents.

On the overall response, seven out of nine participants were aware of the covid-19 advisory and case management protocol in the facility, one respondence said she is aware there were focal persons in every unit/wards, in addition to phone numbers put in place that once you suspect a case you call the Community medicine personnel in conjunction with the state emergency operation centre who form the team saddle with preparedness and response to the epidemic, also all participants were aware of hand washing points at entry and exit of wards, clinics, also use of face masks and sanitizers and social distancing, the plan also involve dissemination of new information, awareness creation, discussing of guidelines and sensitization through whatsApp platforms as clinical and review meetings were all suspended. The team together with the infection prevention and control committee supervises and monitor implementation of the covid-19 protocol in the facility. The coordination between units and departments was well done though with room for improvement as a participant who was positive said she was left at home to continue treatment at home with no support from management notwithstanding the call made to her by the medical director, no proper counselling was offered, no follow-up was done to know how they were doing, hear her "Our welfare was not put into consideration, our contribution in the facility was not appreciated, my family was stigmatized in the community as my husband has to stop praying in the community Mosque".
Another weakness of the response and coordination was lack of effective communication as attested to by a participant, as she was not aware of when to return to work after testing negative.
Generally the key lessons learnt were that Observance of hand washing, use of gloves and mask and other PPE should not be only during an epidemic such as covid-19 pandemic, rather at all times the use awareness and use of universal precautions should be a standard practice in the centre in addition to ensuring a healthy hospital environment with a good waste management protocol in place.

The recommendations made include Administrative/management control measures to ensure availability of Personal Protective Equipment (PPEs) on a sustainable basis to all units and departments, engineering control to ensure all units and department are able to keep to social distancing in clinics, consulting rooms and other spaces, continues health education information and behavioural change messages to all staffs, patients and patient relatives in the hospital by the public health department, finally the welfare, psychosocial well-being of staffs should be of concern to management especially at such periods when they fall ill as a result of exposure to occupational health hazards.

DISCUSSION

The Covid-19 infection has negatively impacted the uptake of maternal and newborn services at the federal medical centre Gusau.

Absolute decline in uptake of services by clients was observed during the three months lock down period as compared to three months pre-covid lockdown period for all category of MNCH services. Qualitative interview with unit heads elaborated on a number of measures instituted in the hospital to curtail patient inflow and ensure safety as contributory factors to the decline. These measures include deliberate scale down of most of the MNCH services such as ANC ,FP PNC ,Immunization child health clinic and the nutrition; which was completely shut down due to unit staff being affected by the infection .The decline in service uptake also subsist when compared to the corresponding months in the year before COVID first wave.

Decrease in utilization of health services is a common pattern seen in previous studies during pandemic and disease outbreak this was the experience during the Ebola outbreak and also in a study in Norway, where telemedicine was deployed to bridging uptake gap in lieu of physical (Kjerkol,2020), Telemedicine was not one of the options adopted at the FMC Gusau.
Specifically in this study, decline in uptake of 73% ,67%, 38% was observed for ANC, PNC, immunization respectively; This effect is more marked compared to the findings during the Ebola outbreak; antenatal care coverage decreased by 22 percentage points, postnatal care (13 percentage points), coverage of family planning (6 percentage points), and facility delivery (8 percentage points) (Lancet Global health,2020;UNDP,2020) Modeling studies during the Covid 19 outbreak also indicates association with decline with MNCH services (Timothy et al.,2020).
These observed reductions is partly likely to be due to lockdown restrictions (Ahmed,2021) which limits physical access, exacerbated by reduced transport availability and the real or perceived threat of prosecution for travelling in public spaces. Internal measures to curtail in flow of patients instituted by the hospital and as well as decrease demand as a result of the pervading atmosphere of fear of contracting the disease and stigmatization are also likely factors. Similar reasons has been adduced for the decline in uptake in several Qualitative studies during epidemic/pandemic ((Timothy et al., 2020; Lancet Global health, 2020). Reduction in uptake of MNCH services has far reaching consequences more than the disease itself and manifest long after acute period of the infectious disease outbreak as evidence from previous studies (Saskia, 2021; Ahmed et al, 2021). Decline in service uptake can indirectly results in increase in mortality with large increases in maternal and child deaths expected in LMIC like ours based on modeling studies (UNDP, 2020) The least severe modeling scenario of coverage (coverage reductions of 9·8–18·5% and wasting increase of 10%), over 6 months indicates there would be 253 500 additional child deaths

and 12 200 additional maternal deaths in the 118 countries studied (Timothy et al., 2020).

Elsewhere, the indirect impact of the COVID-19 pandemic on maternal and newborn health in India, Indonesia, Nigeria, and Pakistan over 12 months was estimated; however, different assumptions and scenarios were used, yielding an estimate of 766 180 additional deaths (31 980 maternal deaths, 395 440 newborn deaths, and 338 760 stillbirths) across these four countries alone, which would correspond to a 31% increase in mortality (Ahmed et al., 2021; Ntambara and Chu; 2021).

ANC service uptake reduced by 73 % during the lockdown period in this study, such reduction of ANC visits can limits uptake of interventions that can improve perinatal outcome and the implications for maternal and neonatal health are likely to be significant. Decline in provision of FP services was also observed as only oral contraceptives was on offer as shared by the unit head irrespective of clients' needs this negates their human rights to access RH services .There are however, other service delivery options that can be considered to sustain access to contraceptive during the pandemic such virtual counseling to initiate oral contraceptive, manage side effects ,others include self-contraceptive injection ,prolong LARC use based on science for those that needs removals ,provision of temporary contraceptive and selected LARC provision based on an appointment system after prior virtual counseling to reduce waiting time (Mc Nicholas,2017 and CDC,2016).

The effect of covid -19 on nutrition services was however marked as the unit was reported to be totally closed due to infection of the staffs in the unit. This can exacerbate the already poor nutrition indices as 37% of Nigerian children age 6-59 months are stunted (short for their age), 7% are wasted (thin for their height), 22% are underweight (thin for their age), and 2% are overweight (heavy for their height) percentage of stunting in children under 5 years is 50.8 % in the study setting (Zamfara state) while prevalence of acute malnutrition is 9.1(MICS, 2017). Consequentially, this can potentiate excess child morbidity and mortality. Findings from a modeling study indicate Covid related disruption could result in an additional 9.3 million wasted children and 2, 6 million stunted children, 168,000 additional child deaths, 2.1 million, in addition children that suffers stunting has associated poor health outcome and poor cognitive development with potential to limit attainment of their full potential as well as negative effect on the nation's economy on the long term (Saskia, 2021; Ntambara 2021).

Immunization uptake as observed form this study declined 36% over the three month period of lockdown this can accentuates the overall decline in population coverage and threaten the Nigeria continuous effort to ramp up to improve immunization to achieve herd coverage for vaccine preventable. Currently vaccine coverage is poor; in Nigeria only 33% of children under the age of 2 years are fully immunized, for the North west state of Zamfara it is 7% (MICS, 2017) Decline in routine immunization uptake makes children vulnerable to increased risks for outbreaks of vaccine-preventable diseases, additionally, it might be hard to reinstate even short gaps in vaccination coverage once care-seeking patterns are broken (Mortality Reort, 2020).

The decline in deliveries 21% and caesarean sections 15% is less marked compared to other MNCH services in this study as corroborated by the head of Obstetrics and Gynecology as well as the labour unit head; service delivery was maintained, the slight decrease might have been result of fear and panic by patients as a result of the COVID-19 imposed restrictions. Access to skilled birth attendance and an enabling environment is known to have profound positive impact on mortality and morbidity and has potential to avert 60% additional maternal and perinatal death (Global health, 2020). These services unlike other MNCH services are not amenable to post outbreak mitigation measures. The data also showed a decrease of client inflow in the same period, this was the pattern of finding by Ahmed *et al*., 2021 who found that utilization of basic maternal newborn child health care decreased during the covid-19 pandemic siting principally the lockdown and lack of access to essential commodities as the main reason for this decrease.

The susceptibility of Health workers to infection is heightened during disease outbreak (Global health, 2020) as also shown in this study .Though there was provision of PPEs and institution of infection prevention measures instances of inadequacies were reported. This further highlight the need to strengthen and prioritized protection and safety of health providers and patients. This is essential to ensure continuity of MNCH service.
Additionally, the psychosocial and mental wellbeing of health providers need to be prioritized during period of epidemics or pandemics, the experience of one affected individual in this study is illustrative as she suffers emotional trauma with spiral effect on the family at the home front due to fear and stigmatization, likewise health providers are known to be prone to burnt out during this period (Timothy et al.2020)

Conclusion
The Covid 19 pandemic has had adverse effect on the uptake of MNCH services, in this study this has potential negative consequences on morbidity and mortality. Multiplicity of measures taking during the pandemic including movement restriction, hospital response plan and facility practice changes to curtail inflow of patients as well as pervading atmospheres of fear and stigmatization are contributory factors

Alternative service delivery model during disease outbreak should be considered for provision of MNCH services (namely antenatal care, postnatal and Family planning care, nutrition and immunization services] through adopting safe in-hospital practices for patient care such as reorganization of patient flow to limit numbers at a time, dedicated screening and holding areas, rearrangement of workforce to work as dedicated teams that work in rotations to minimize impact and limit the overall impact to only the specific team in the event a team member is affected ,others includes outreach and mobile clinics in collaboration with relevant health authorities as well as adoption of tele-health services to mitigate the decline in service uptake

The study also highlights the need to ensure safety of health providers through adequate provision of PPE and adoption of effective infection prevention control to ensure service continuity. Clear guideline and advisory to protect and deal with affected health providers should be instituted including welfare and psychosocial support to improve their mental wellbeing
Going forward there is need to monitor the indirect effects of

COVID-19 on essential MNCH services using a clear set of indicators and visualizations to inform corrective actions

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