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Abstract

Background: COVID-19 is having many impacts on health, economy and social life; some due to the indirect effects of closure of health facilities to curb the spread. Closures were implemented in Pakistan from March 2020, affecting provision of reproductive, maternal, newborn and child health (RMNCH) services.

Aims: To appraise the effects of containment and lockdown policies on RMNCH service utilization in order to develop an early response to avoid the catastrophic impact of COVID-19 on RMNCH in Pakistan.

Methods: Routine monitoring data were analysed for indicators utilization of RMNCH care. The analysis was based on Period 1 (January–May 2020, first wave of COVID-19); Period 2 (June–September 2020, declining number of cases of COVID-19); and Period 3 (October–December 2020, second wave of COVID-19). We also compared data from May and December 2020 with corresponding months in 2019, to ascertain whether changes were due to COVID-19.

Results: Reduced utilization was noted for all RMNCH indicators during Periods 1 and 3. There was a greater decline in service utilization during the first wave, and the highest reduction (~82%) was among children aged

Conclusion: To reinstate routine services, priority actions and key areas include continued provision of family planning services along with uninterrupted immunization campaigns and routine maternal and child services.

Keywords: RMNCH indicators, COVID-19, service utilization, maternal health, child health

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Introduction

The rapid devastation and global health catastrophe caused by the COVID-19 pandemic is a wake-up call for the world to acknowledge the collective vulnerability of humans to infection across the globe. COVID-19 caused by SARS-CoV-2 was first reported in Wuhan, China in December 2019 (1). SARS-CoV-2 has extremely high transmissibility with an estimated mean reproduction number (R0) within the range of 1.01–2.79, which has resulted in exponential growth in the number of cases worldwide (2). As of May 31, 2021, 170.73 million cases of COVID-19 had been reported worldwide, including 3.66 million deaths, while in Pakistan, the number of confirmed cases surpassed 922 824, with more than 20 000 deaths (3).

With low global vaccination rates (4) and few empirically proven effective treatment methods (5), countries are forced to adopt population-level widespread restrictions such as curfews and lockdowns, in order to limit contact between people to slow down transmission and exponential growth of cases (6). Pregnant women and children in low- and middle-income countries, are likely to face the largest impact owing to disruption of primary health care and essential maternal and newborn services (7). Recent modelling exercises estimate that the four most populous low- and middle-income countries (India, Indonesia, Nigeria and Pakistan) alone could see a 31% increase in maternal and newborn deaths and stillbirths as a result of disruption to essential reproductive and maternal healthcare services in the next 12 months (8). There are lessons to be learned from the Ebola epidemic of 2014, when due to the disruption of these services, the number of maternal and neonatal deaths indirectly caused by the epidemic were more than the number of deaths caused by Ebola virus itself (9).

During the initial phase of the pandemic (March–April 2020), the Government of Pakistan took immediate steps to contain the spread of COVID-19. The outpatient departments in the public sector, including primary, secondary and tertiary level hospitals, were either closed or only partially open during Mar to July 2020. With the emergence of the second wave of COVID-19 in September, a similar approach was adopted and most health services were partially restricted. This lack of availability of routine health services including reproductive, maternal, newborn and child health (RMNCH) services, could have resulted in reduced utilization of services by pregnant women and their children. This study was therefore conducted to appraise the effects of containment and lockdown policies on RMNCH service utilization, in order to develop an early response to avoid the catastrophic effects of COVID-19 on maternal, newborn and child health.

Methods

We conducted an analysis of routine monitoring data, collected through the district health information system (DHIS), from all primary and secondary level public sector health facilities during 2020. Pakistan has a well-developed DHIS, which serves as a structured routine information source to generate health indicators and reports aggregated data at the district level (10). Using structured reporting tools, information is received from all primary and secondary level public sector health facilities at the respective district health offices. The information is

collated at each provincial dedicated DHIS cell, which is responsible for collating the received reports on a monthly basis. At the federal level, the Ministry of National Health Services, Regulations and Coordination (MNHSRC) through its Health Planning, Systems Strengthening and Information Analysis Unit has developed a well-functioning integrated HIS, which is linked with the respective DHIS databases of each province. These linkages are used for deriving national level outputs from the respective DHIS segments of the provinces on a regular basis, and answer health data/analysis requests from the Government of Pakistan and other development partners on a regular basis.

Data were extracted from the national DHIS database to determine if there was a change in the utilization of routine RMNCH services across all public health facilities due to the COVID-19 pandemic. A subset of indicators within the MNCH continuum of care that showed the greatest impact in similar past epidemics were selected (11–13). Completeness of information and a possibility to track these indicators through the National DHIS database over time were also considered as important factors for the selection of these indicators. The key variables selected for analysis within the maternal health domain included the number of family planning (FP) visits, first antenatal care visit for pregnant women, deliveries conducted in public health facilities, number of caesarean sections, and number of first postnatal visits. Within the child health domain, the number of children who received a third pentavalent injection (vaccine used by the Expanded Program on Immunization in Pakistan to protect against diphtheria, pertussis, tetanus, hepatitis B and Haemophilus influenzae type B), number of reported cases of diarrhoea and pneumonia, and number of treated pneumonia cases were included. Data queries were run through the specialized DHIS software and time-and province-based summary outputs were calculated. Analysis was based on three separate time periods in 2020: Period 1 (January–May), corresponding to the first wave of COVID-19; Period 2 (June–September), when the number of cases showed a declining trend; and Period 3 (October–December), corresponding to the second wave of COVID-19. We also compared data from May and December 2020 with corresponding months in 2019, to rule out any possible natural increase or decrease in the use of services, and to confirm that the changes noted were due to COVID-19. We analysed the change in service utilization by calculating the difference between the number of women who utilized each RMNCH service between the 2 months. We divided this difference by the number of service users in the preceding month and multiplied it by 100 to calculate the percentage difference in service utilization (14). All outputs with a negative sign show a percentage decrease over time.

Since the study was based on secondary analysis of DHIS data, which is a routine process at the MNHSRC, no formal approval was obtained from an ethical review board. The datasets used and/or analysed during the study are available from the MNHSRC on reasonable request.

Results

Figure 1 shows the utilization of RMNCH services during the COVID-19 pandemic between January and December 2020 in Pakistan. There was a gradual and consistent decline in the utilization of all RMNCH services for all key indicators within the maternal and child health domains. This drop in service utilization correspond to the increasing number of COVID-19 cases and the subsequent lockdown during the first wave. As the number of COVID-19 cases started going down in July, we saw a contrasting rise in the utilization of services, that peaked in September 2020. With the onset of the second COVID-19 wave in October, service utilization declined again and did not improve until the end of 2020. The decline was more profound for services related to child health compared to maternal health services. The number of children aged

Table 1 shows the change in utilization of key RMNCH services from January to December 2020. The utilization of services is shown across three time periods that corresponded to the first wave of COVID-19; the period when preventive measures were able to bring down the number of cases; and the second wave of COVID-19. The largest drop in utilization of all key RMNCH indicators was during Period 1 (January–May 2020), with the highest reduction (81.5%) seen among children aged

Table 2 shows the comparison of key RMNCH services utilized between 2019 and 2020. May and December were used as reference months because the number of COVID-19 cases proliferated most in those months. There was a reduction in service utilization for all indicators for both timepoints compared, although there was a greater decline in the use of services in May 2020. The reduction in the number of children aged

Figure 2 shows the decline in service utilization stratified by each province in the first wave of COVID-19. The bars represent the national percentage reductions in the utilization of RMNCH services from January to May 2020, while the dots represent various provinces. Province-wide analysis showed that Balochistan and Khyber Pukhtunkha suffered from massive reductions in the utilization of services for most indicators, which were higher than the national average. Khyber Pukhtunkha showed major drops in utilization of services such as first antenatal care visit, first postnatal care visit, family planning, and treatment of children aged

Discussion

Utilization of RMNCH services declined during the first and second waves of COVID-19 in Pakistan. The highest reduction of almost 82% was observed for children aged

Pakistan's mission for improving its RMNCH indicators has faced substantial challenges even in the pre-COVID 19 era (15). With one of the highest maternal mortality ratios and highest neonatal mortality rates in South Asia, the country's public sector has struggled to improve the coverage and quality of maternal and child health services (16–18). However, an incremental increase in utilization of antenatal care services, and institutional deliveries was documented by the most recent Pakistan Demographic and Health Surveys (19, 20). In contrast, the proportion of women with a postnatal check-up within 48 hours after birth has remained largely unchanged, and the neonatal mortality rate is still the highest in South Asia at 94 deaths per 1000 livebirths

(21). The last 5 years of RMNCH data in Pakistan show a mixed trend with a few unchanged indicators and substantial gains in specific areas (22).

Our analysis showed that the COVID-19 pandemic was likely to have had a detrimental effect on the gains that Pakistan achieved through improved coverage and enhanced services in recent years. Concomitantly, the disruption in provision of routine essential RMNCH services due to the pandemic likely exacerbated some of the existing access-related challenges for mothers and children. Our analysis reflected a marked decline in the utilization of public health services across the entire essential RMNCH-related continuum of care. Against a backdrop of an already suboptimal availability and use of family planning services in Pakistan, our results showed a further reduction in access to family planning services. Even where family planning services remained available, women were commonly confined within their homes with their husbands, and in the absence of birth control, might be facing a huge challenge of unwanted pregnancies in the coming months. A one-third reduction in the number of women who received their first antenatal care by a qualified health professional will deprive thousands of pregnant women of timely identification of pregnancy-related complications (23). A drop in the number of institutional deliveries and caesarean sections tended to neutralize the recent reduction in maternal mortality ratio. The effects of all three pre-existing delays leading to maternal mortality, that is, deciding to seek appropriate medical help, reaching a facility, and receiving adequate care, were accentuated by COVID-19. This was primarily because of an absence of transportation due to lockdown and partial or complete closures of routine health facilities. The overall magnitude of the negative effect will take time to manifest, although our analysis is already pointing towards deterioration in services uptake.

COVID-19 related restrictions could further affect the already poor outcomes of neonatal and child health in Pakistan. Pneumonia is one of the major contributors towards child mortality in Pakistan (19) and the biggest concern is a significant drop in the number of reported and treated cases in children aged

Similar disruption to RMNCH services in West Africa was imposed by Ebola during 2014–2015. The largest decline seen within maternal services included decreased utilization of antenatal and postnatal care, a marked reduction in the number of caesarean sections and facility-based deliveries in all Ebola-affected countries (11,12,26). There was also a drop in utilization of children’s health services, especially in terms of vaccination and treatment of diarrhoea and pneumonia cases; possibly because parents were reluctant to visit a health facility (13). Changes in the coverage of routine essential RMNCH services and life-saving measures resulted in a high number of deaths among children and women of childbearing age. Looking at modelling estimates under the most conservative scenario, the overall decrease in utilization of RMNCH services translated into an additional 3600 maternal, neonatal and stillbirth deaths in Sierra Leone during 2014–2015 (9).

The Government of Pakistan during the initial phase of the pandemic in March 2020 adopted early and stringent nonpharmacological interventions to contain the spread of COVID-19, such as imposition of lockdown in some of the larger urban areas. Within the health sector, the outpatient departments of public sector primary, secondary and tertiary level hospitals were either closed or only partially open. The delayed South Asian COVID-19 pandemic and early implementation of health-sector-related interventions (27,28), is now being linked with positive outcomes in relation to the control of COVID-19. These interventions, however, resulted in low rates of utilization across the routine RMNCH services as shown by our study. As a consequence, the medium- to long-term negative effects of COVID-19 and the various containment strategies and restrictions adopted by Pakistan are likely to manifest as higher rates of RMNCH-related morbidity and mortality. Our analysis was limited by the issues of routinely collected data through management information systems such as accuracy, precision and completeness of data collected. Despite these limitations, the study provides valuable information on the effects of the COVID-19 pandemic on the utilization of RMNCH services by women and their children.

We are already seeing the sobering effects of the pandemic on achieving Sustainable Development Goal (SDG) targets. Pakistan secured a score of 55.6 under SDGs' global index and ranked 122 on the SDG index out

of 157 countries in 2020 (29). COVID-19 has exposed the existing inequalities such as lack of health protection and limited universal health coverage, which has affected the poorest and the most vulnerable. Pakistan's expansive disease burden profile, commonly labelled as a double burden of disease in terms of high instance of communicable and noncommunicable diseases, and a rapidly expanding population (fifth highest in the world), warrants a holistic and comprehensive approach to reduce the respective segments of the diseases burden in times of COVID-19.The improving trend in the coverage of RMNCH services observed during recent years has clearly been affected during the COVID-19 pandemic as reflected in our analyses. To reinstate routine services, public and private sector healthcare needs to work on an urgent basis and in a harmonized manner. Priority actions and key areas to be addressed include continued provision of family planning services along with uninterrupted immunization campaigns and routine maternal and child services. Front line community workers should be mobilized to deliver essential medicines, supplements

and basic RMNCH care after providing them basic trainings on how they could protect themselves and those who come in contact with them. The guidelines developed by the MNHSRC for health facilities and service providers should be thoroughly implemented to maintain routine and essential health services. Staff should be adequately trained on these guidelines to prevent further spread of the virus while at the same providing basic RMNCH care to pregnant women and children.

Conclusions

We have seen that measures taken by the Pakistani Government to contain COVID-19 have resulted in a marked reduction in the availability, accessibility and utilization of routine health services. The expected further waves of COVID-19 mean that it is time that the health system in Pakistan worked towards effective and safe provision of routine RMNCH services across the country, while being cognizant of the required infection prevention and control measures instilled across the system. This is anticipated to help mitigate a possible increase in the RMNCH-related morbidity and mortality in Pakistan, and facilitate reversing the negative impact on the recent gains across key RMNCH health indicators.

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Effets indirects de la pandémie de COVID-19 sur les services de santé reproductive, maternelle, néonatale et infantile au Pakistan

Résumé

Contexte: La COVID-19 a de nombreux impacts sur la santé, l'économie et la vie sociale, certains étant dus aux effets indirects de la fermeture des établissements de santé pour freiner la propagation. Des fermetures ont été imposées au Pakistan à partir de mars 2020, affectant la fourniture de services de santé reproductive, maternelle, néonatale et infantile.

Objectifs: Évaluer les effets des politiques d'endiguement et de confinement sur l'accès aux services de santé reproductive, maternelle, néonatale et infantile afin de mettre en place une

réponse rapide pour éviter l'impact catastrophique de la COVID-19 sur ce type de services au Pakistan.

Méthodes : Les données de suivi de routine ont été analysées pour l'utilisation des indicateurs relatifs aux soins de santé reproductive, maternelle, néonatale et infantile. L'analyse était basée sur la période 1 (janvier-mai 2020, première vague de COVID-19) ; la période 2 (juin-septembre 2020, nombre décroissant de cas de COVID-19) ; et la période 3 (octobre-décembre 2020, deuxième vague de COVID-19). Nous avons également comparé les données de mai et décembre 2020 avec les mois correspondants en 2019, afin de vérifier si les changements étaient dus à la COVID-19.

Résultats : Une utilisation réduite a été constatée pour tous les indicateurs de santé reproductive, maternelle, néonatale et infantile au cours des périodes 1 et 3. La première vague a été marquée par une baisse plus importante au niveau du recours aux services, et le nombre d'enfants âgés de moins de 5 ans, traités pour une pneumonie, a connu le déclin le plus significatif (~82 %). Le nombre de césariennes a chuté de 57 %, suivi par les accouchements en établissement et la première visite postnatale (37 % respectivement). L'accès aux services a augmenté entre juin et septembre, mais la deuxième vague de COVID-19 a entraîné une nouvelle baisse.

Conclusion : Pour rétablir les services systématiques, les actions prioritaires et les domaines clés comprennent la prestation continue des services de planification familiale, l'organisation de campagnes de vaccination sans interruption et la prestation des services systématiques de santé de la mère et de l'enfant.

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