The effects of COVID-19 pandemic on maternal and childhood health services in Meru County, Kenya

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Background: COVID-19 pandemic put unprecedented burden on healthcare systems, globally. Women and children were most affected. It was thus necessary to examine its effects on Maternal and Child Health (MCH) services in Meru County Kenya, to design mitigation strategies against drawbacks to safeguard previously made gains.

Methods: Ethical clearance was obtained from Meru University Institutional Research Ethics and Review Committee (MIRERC). MCH Data for one year before and one year after the pandemic were analyzed using SPSS computer package and compared. Statistical tests were carried out using 2t test and descriptive and inferential statistics employed for summaries.

Results: No significant change occurred in the proportion of Fully Immunized Child (FIC) at p<.05 as t (24) = 1.72, p=.098. Nevertheless, the proportion of women with 4th antenatal care visit and adolescents 10 - 14 years pregnant at the first ANC visit, had lower and higher mean scores before and after the pandemic with significant changes at p=.05 of (p=0.011) and (p=0.003) respectively.

Conclusions: The pandemic did not affect MCH service indicators during the first year of the sickness in Meru County. However, the proportion of teenage pregnancies increased significantly, as the proportion of women with 4th antenatal care visit decreased.

KEY WORDS
COVID-19
Pandemic
Maternal and child Health
Meru

Background
The unique conditions of the 21st century, have reshaped the invasive power of disease causal agents, disrupting the balance of epidemic occurrences and disease transmission landscape unprecedentedly. Consequently, novel infectious diseases such as COVID-19 pandemic, Ebola and other public health emergencies continue to occur.

The first confirmed case of COVID-19 infection caused by the novel coronavirus was reported in a 55-year-old individual from Hubei Province in China in November 17th, 2019 (WHO, 2020). The first confirmed case of COVID-19 outside of China was reported in Thailand on January 14th 2020, the time when WHO technical team established human to human transmission in China (WHO, 2020).

During the same period, the first confirmed
case of local transmission in the USA was recorded (Ghinai et al, 2020). By 21st February, nine European countries had reported 47 cases with 38 of them linked to two clusters in Germany and France and 14 having been infected in China (Spiteri et al, 2020). Clearly, the virus was circulating at the speed of the jetliners.

Within a short period, COVID-19 spread to other parts of the World and Africa. WHO declared it a pandemic on 11th March 2020 (Lone and Ahmad, 2020). The first case of COVID-19 in Kenya was confirmed in Nairobi on the 12th March 2020. This was a Kenyan citizen who had travelled back to Nairobi from USA via London UK, on the 5th of March 2020 (Ministry of Health, Kenya).

Despite early reports showing more men dying from COVID-19, the health of women and children was generally negatively impacted through resource reallocation, missed opportunities and priorities setting. This led compromised sexual and reproductive health care services (UN, 2020). The objective of this study was to document the effects of COVID-19 pandemic on Maternal and Childhood Health services in Meru County, Kenya to recommend mitigation strategies and avoid gains made in MCH service indicators over time.

Usually, hospital visits are associated with increased chances of infection. This fear heightened during the COVID-19 pandemic. However, WHO and Ministries of Health encouraged the public to attend health facilities for essential services including immunization because compromised maternal medical care during pregnancy and sub optical MCH services such as immunization of children could be more harmful (WHO, 2020).

The pandemic resulted in rapid increase in demand for services to health systems and governments throughout the world (WHO 2020). In addition, COVID-19 infections were treated with fear, stigma and discrimination which discouraged the patients to go for services. The health workers including nurses and midwives, who usually ensure vaccinations, safe pregnancies and births are conducted professionally, information on contraceptives and counselling of women and young people are effectively carried out developed low morale (UNFPA, 2020).

Therefore, as countries grappled with rising numbers of COVID-19 cases, postponement and suspension of both routine and elective health services may have resulted (WHO, 2020). That would possibly reverse gains made previously, in many low- and middle-income countries (Menendez et al, 2020).

It has previously been found that countries with high maternal mortality rate (MMR), are strongly associated with weak health systems. COVID-19 pandemic further strained the already weak health systems, severely impacting essential health care services such as MCH clinic attendance in low- and middle-income countries (UNFPA, 2020) such scenarios may have worsened maternal and neonatal mortality rates (Bong et al, 2020).

During an outbreak of a novel infectious disease, systems focus on the cases and deaths and pay less attention to the indirect effects as in the case of Ebola in Sierra Leone (Kassa et al, 2022). It is important to assess sub optimal utilization of essential routine health services for rational reallocation of meagre resources for both the crisis and core essential health care services (Sochas et al, 2017). Elsewhere, modelling of possible scenarios of increased mortality from sub optimal performance of health systems showed negative impacts of COVID – 19 on MCH services (Chmielewska et al, 2021: Stein et al, 2020). This paper compared one-year period performance of MCH services before COVID-19 outbreak one-year period after COVID-19 pandemic in Meru County.

Methodology
This was a descriptive cross-sectional comparative study between the proportions of clients accessing MCH services prior to COVID-19 and post-COVID 19 pandemic periods. The study examined the impact of COVID-19 outbreak in Meru County on Maternal and Child Health (MCH) services in order to recommend mitigation strategies against its effects and safeguard against previously made gains in this important service.
Ethical clearance for the study was sought from Meru University of Science and Technology Institute of Research Ethics and Review Committee (MIRERC). Authority to review health records was sought and granted by the Meru County government Health Services. In addition, structured focused group discussions and key informant interviews were conducted to triangulate data from health records. Data were analyzed using SPSS computer package and a period of one year before and one year after COVID-19 pandemic were compared in the nine sub-counties. Statistical tests were carried out using 2t test and descriptive and inferential statistics employed for summaries.

Results
The first antigen administered to new-born babies is the BCG. The vaccine is given to prevent infection with Tuberculosis (TB). It is thus mandatory at birth or soon thereafter. The study looked at the performance of this antigen one year before and one year after COVID-19 pandemic across the nine sub-counties of Meru County. In Buuri Sub County, the performance of vaccination of children with BCG before COVID 19 (M= 25.92, SD =8.1) compared to the period after COVID-19 (M= 37.24, SD 10.3) demonstrated better coverages after COVID-19 period. t (24) = -5.10852, p<0.001. As it came out from the Key Informants, mothers believed childhood vaccinations prevent COVID-19 infections.

Igembe Central sub-County confirmed similar results before COVID 19 (M= 69.41, SD =6.6) compared to the period after the pandemic (M= 91.01, SD 18.7). The performance was statistically significantly better after COVID-19, t (24) = -3.79221, p<0.001. As gathered from Key Informants, mothers believed childhood vaccinations prevent COVID-19 illness.

However, there was no significant difference in performance in Igembe North Sub County before and after COVID; (M= 65.3, SD =9.1) compared to (M= 66.04, SD 19.1) with t (24) = -0.12153, p=.90. Igembe South Sub County had worse performance before COVID 19, (M= 148, SD =23.7) compared to the period after COVID-19 period; (M= 169, SD 21). There was a significant difference in coverages between the two periods. t (24) = -2.17925, p=.04. In this sub county, mothers felt vaccinations were vital and protected their children from all diseases.

Nevertheless, Imenti Central had better performance before COVID 19 (M= 86.55, SD =39.7) compared to (M= 76.03, SD 9.6) after COVID-19. That notwithstanding, there was no significant difference in performance between the two periods. t (24) = 0.96227, p=.35. Similar observations were made in North Imenti where the performance before and after COVID 19 was (M=118, SD =26.9) and (M= 105, SD 29.1) correspondingly. This demonstrated no significant difference in performance as t (24) = 1.19748, p=.24.

However, Imenti South posted different performance before and after COVID 19 (M=69, SD =5.9) and (M= 80, SD 8.3) respectively. There was a significant difference in coverages. t (24) = -3.16869, p=.001. The performance was better after COVID-19 period. This is also one of the sub counties where Key Informants said vaccines protected children from COVID-19.

The performance during COVID-19 period in Tigania East was better after COVID-19 pandemic; (M= 56.84, SD 18.8) compared to (M=41.02, SD =4.5) before COVID-19 period. The results were significant at p<.05, t (24) = -2.73024, p=.011. Tigania West also had similar results where the performance before COVID 19 was (M=36.82, SD =8) compared to COVID 19 period (M= 47.94, SD 9.9). t (24) = -2.97466, p=.006. In both cases, mothers believed routine vaccinations worked against COVID-19.

Despite variations in the sub county BCG coverages, there was statistically no significant difference in overall performance of BCG coverage one year before and one year after COVID-19 pandemic in Meru County, t (26) = -1.06640, p = .30. (see figure 1).

The proportion of under 1 year fully immunized children (FIC) before COVID-19 (M=63.78, SD =11.2) compared to after COVID 19 period
(M=72.32, SD=14) demonstrated no statistically significant difference at p<.05 as t (24) = 1.72, p=.098. (figure 2)

The proportion of the 4th antenatal care visit 12 months before COVID-19 (M=41.29, SD =3.7) compared to 14 months after COVID 19 period, (M=37.11, SD=4.28) demonstrated significantly better performance before COVID-19, at p<.05, t (26) = 2.73, p=.011. (figure 3)

The proportion of pregnant women who were adolescents (10-19 years) one year before COVID-19 (M=49.12, SD =8.9) compared to one year after COVID 19 period (M=48.31, SD=10.09) demonstrated no significant difference at p<.05. t (24) = 0.22, p=.83 (figure 4)

The proportion of pregnant women who attended at least one ANC during pregnancy before and after COVID-19 period (M=77.5, SD =9.9) compared to 14 months after COVID 19 (M=81.85, SD=14.8) demonstrated no significant difference in attendance at p<.05. t (26) = -0.84, p=.41 (figure 5)

The number of women of reproductive age (WRA) who received Family Planning (FP) Commodities 12 months before COVID-19 (M=13729, SD =1,711) compared to 14 months period of COVID-19 pandemic (M=11,532, SD=3,459) demonstrated no significant difference in coverages at p<.05. t (26) = 1.92, p=.66
A total of 434 adolescents (10 – 14 years) were pregnant on the first ANC visit before COVID-19 pandemic in Meru County. Slightly more than a third of the cases 146 (33.6%) were reported in Igembe Central Sub-County. During the pandemic, 1,700 adolescents presented with pregnancies during the first ANC visit. Imenti North reported the highest number of cases (449) followed by Imenti South (436) and Igembe North in that order.

The proportion of Pregnant women who were adolescents presenting with pregnancies during the first ANC visit 12 months before COVID-19 (M=36.17, SD =14.94) compared to 12 months after COVID-19 pandemic (M=127.93, SD=96.56) demonstrated significant difference in teenage pregnancies during the COVID-19 period at p<.05. t (26) = -3.25, p=.003.

The proportions of BCG coverage before and after COVID-19 periods in the nine sub-counties of Meru differed probably because of lockdowns and travel restrictions as explained by the key informants during the interviews.

However, despite variations in the intra sub-county coverages, the overall BCG performance before and after COVID-19 periods did not differ. The reason for status quo in our case is explained by Key Informant interviews which found mothers that believed routine vaccination had protection against COVID-19 infections. This was so in Buuri, Igembe Central Imenti South, Tigania East and Tigania West. This finding disagrees with others that found 25% global reduction of BCG consumption within the disruption period (Shaikh et al, 2021).

The examination of fully immunized children (FIC), who had received (1-dose BCG, 3-dose DTP-HepB-Hib, 3-dose polio, 1-dose measles, and 3-doses pneumococcal vaccines) children aged 12 to 23 months during the pre-COVID and post COVID era in Meru County presented different performance patterns across the sub counties before and after COVID-19.

The proportion of fully immunized children before COVID-19 in Buuri, Igembe Central and Igembe South sub-counties demonstrated worse coverages. The performance after COVID-19 were significantly better at p<.05. t (26) = -2.37031, p=.026. The key informants in those sub counties...
alluded to the routine vaccines’ ability to protect children against COVID-19. The findings correspond with other studies reporting improved vaccination during the pandemic (SeyedAlinaghi et al, 2022).

In Igembe North and Imenti South sub counties, the proportion of fully immunized children did not differ between the two periods. These findings concur with those of a study in Kilifi County Kenya, where the pandemic did not adversely affect vaccination achievements. (Lucinde et al, 2022). However, in Imenti North, the mean proportion of FIC before COVID 19 (M=97.81, SD =12.9) was better compared to vaccination after COVID-19 (M= 83.49, SD 7.6). t (26) = 3.37767, p=.002 at p<.05. The findings in this subcounty concurs with studies done in Canada (Akseer et al, 2020: Ji C et al, 2022). In such a scenario, it is likely that children missed some antigens during the pandemic and catch-up immunization activities are necessary. This is consistent with studies in Pakistani and Canada, where children were found to have missed measles and polio vaccines (Rana et al, 2021; MacDonald et al, 2021).

It is highly probable that overall, the proportion of fully immunized children (FIC) before COVID-19 (M=63.78, SD =11.2) compared to post COVID-19 period (M=72.32, SD=14) demonstrated no significant difference at p<.05 as t (24) = 1.72, p=.098 because of the sub counties that performed better during COVID-19 pandemic. Moreover, mothers in five counties believed routine immunization prevented SARS CoV-2 as well as other preventable diseases. In spite of that, there were missed opportunities across sub counties. This finding concurs with a study where declines in children’s immunizations was reported in India (Chakrabarti et al, 2023).

Reproductive health services presented with more spectacular results during the study. The number of women of reproductive age (WRA) who received Family Planning (FP) Commodities remained the same throughout the two periods. The study agrees with the findings of UNFPA which found no declines in use of modern contraception in Burkina Faso, Democratic Republic of the Congo, Kenya and Nigeria (UNFPA, 2021). However, the proportion of adolescents who presented with pregnancies during the first ANC visit before COVID 19 (M=36.17, SD =14.94) compared to post pandemic period (M=127.93, SD=96.56), demonstrated significant difference in teenage pregnancies during the COVID-19 period at p<.05, t (26) = -3.25, p=.003.

A total of 434 adolescents (10 – 14 years) were pregnant on the first ANC visit before COVID-19 pandemic in Meru County. The highest number (449/1700 cases) of teenage pregnancies occurring during the pandemic were reported in Imenti North subcounty. This was slightly more than a quarter of the total cases (26.4%). Nonetheless, this disagrees with findings a study done in Uganda where the prevalence of teenage pregnancy was higher at 30.6% during the pandemic (Musinguzi et al, 2022).

In Meru County, 1700 adolescents were reported pregnant on first ANC visit. Imenti North reported the highest number of cases (449) followed by Imenti South (449) and Igembe Central (390) in that order. All the three sub counties have large urban centres, where probably, the teenagers could have been lured into illicit sex during the lockdowns. Igembe central sub county had the highest proportion of adolescent pregnancies at 146 and before COVID-19 (Table 1). COVID-19 pandemic therefore, could have worsened an already worse situation.

The sub county located in a miraa growing area, known for high dropout rates among school children. It has close proximity to large urban centres (Maua and Kangeta). The interplay of those factors might have exacerbated the engagement of girls into unprotected pre-marital sex leading to higher number of pregnancies than in other sub counties.

Coincidentally, two of the other sub counties with high numbers of teenage pregnancies, have larger urban centres as their headquarters. Meru town is the headquarters of Imenti North which has the second highest number of teenage pregnancies. Nkubu Municipality is the headquarters of Imenti South. Juxtaposition of adolescents to
those urban centres might have had negative in-
fluence putting the adolescents who were out of
school at risk of engaging in illicit sexual activities.
This observation corroborates the findings of an-
other study which found teenage girls at risk of
pregnancy during the COVID-19 lockdowns
(Ouma et al, 2022).

The girls were out of school for long periods
during the lockdowns. This latitude created nega-
tive ripple effect on adolescent sexual and repro-
ductive health among school going girls. In a
sense, COVID-19 eroded gains made on adoles-
cent reproductive health including counselling
and advisories from teachers and health workers
as found in other studies (Okeke et al, 2022).This
study corroborates findings of others which found
girls subjected to COVID-19 measures, at risk of
getting pregnant (Zulaika et al, 2022: Groenewald

The findings in this study also concur with a
study in Uganda which found a third of in-school
teenage girls pregnant during the pandemic
(Musinguzil et al, 2022). Our study clearly shows
more teenage pregnancies occurred during the
COVID19- pandemic. This was due to limited ac-
cess to reproductive health services in son sub
counties in Meru County. These findings agree
with others that found COVID-19 pandemic to
have escalated the problem of poor access to re-
productive health services (Meherali et al, 2021).

Conclusions
COVID-19 pandemic did not fundamentally
affect MCH services during the first year of the
sickness in Meru County. However, the proportion
of teenage pregnancies increased significantly,
while the proportion of women with 4th Antenatal
care (ANC) visit decreased. The Ministry of Health
should enhance ANC attendance among women.
The County health services should identify and
counsel the school girls who conceived before and
during the pandemic with a view to giving them
an opportunity to continue with their education.

Authors’ contributions
GM Conceived the study, collected the data, per-
formed data analysis, wrote and reviewed the manu-
script for publication.

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Competing interests
None declared.

Ethical approval
Ethical clearance was obtained from Meru University
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