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Impact of COVID-19 lockdown measures on mother and child health – the case of Ghana

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Abstract

Background The lockdown measures in response to the coronavirus disease (COVID-19) have led to a wide range of unintended consequences for women and children. Until the outbreak of COVID-19, attention was on reducing maternal and infant mortality due to pregnancy and delivery complications. The aim of this study was to interrogate the impact of lockdown measures on women and children in two contrasting districts in Ghana – Krobo Odumase and Ayawaso West Wuogon.

Methods This study adopted the mixed-method approach using both qualitative and quantitative data. The qualitative study relied on two data collection methods to explore the impacts of COVID-19 control measures on women and children in Ghana. These were: Focus Group Discussions (FGDs; $n=12$) and Key Informant Interviews (KIIs; $n=18$). The study complemented the qualitative data with survey data - household surveys ($n=78$) which were used to support the nutrition and school closure data; and policy data gathered from government websites consisting of government responses to COVID-19. The qualitative data was analysed using the thematic approach with codes generated *apriori* with the NVIVO software. The quantitative data used percentages and frequencies.

Results Engagements with participants in the study revealed that the lockdown measures implemented in Ghana had consequences on child and maternal health, and the health care system as a whole. Our study revealed, for example, that there was a decrease in antenatal and postnatal attendance in hospitals. Childhood vaccinations also came to a halt. Obesity and malnutrition were found to be common among children depending on the location of our study participants (urban and rural areas respectively). Our study also revealed that TB, Malaria and HIV treatment seeking reduced due to the fear of going to health facilities since those ailments manifest similar symptoms as COVID 19.

Conclusion Government responded to COVID-19 using different strategies however the policy response resulted in both intended and unintended consequences especially for women and children in Ghana. It is recommended that national policy directions should ensure the continuous provision of child and maternal healthcare services which are essential health services during lockdowns.

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Background

Lockdown measures in response to the coronavirus disease (COVID-19) have led to a wide range of unintended consequences for women and children. Until the outbreak of COVID-19, attention was on reducing maternal and infant mortality due to pregnancy and delivery complications [1]. About 5.9 million children worldwide die each year from these complications before their fifth birthday and the vast majority of these deaths are preventable [2]. Also, approximately 810 women die every day from preventable causes related to pregnancy and childbirth, especially in Sub-Saharan Africa and Southern Asia [3]. Consequently, mother and child health remain an important public health issue, especially because women and children are vulnerable in many health crises (see Carpenter, 2005) such as the COVID-19 pandemic.

COVID-19 – a global pandemic – was first identified from Wuhan in China and spread across the globe causing deaths and other social and health issues which affected many. On March 12, 2020 the first two cases of COVID-19 were reported in Ghana. On 15th March, 2020, President Nana Addo Dankwa Akufo-Addo addressed the nation and announced measures such as the wearing of face masks, physical distancing, school closure and prohibition of public gatherings of more than 25 persons, including for funerals, church services, workshops and conferences. The Imposition of Restrictions Acts 2020, (Act 1012), was passed by Parliament to provide powers to the President to institute measures directed at controlling the virus. Consequently, areas regarded as transmission hotspots such as Accra, Kumasi, and Kasoa, were put on partial lockdown on March 30, 2020 but after three weeks the lockdown was lifted due to economic reasons [4].

Since 2020, Ghana has experienced an increase in infections across almost all its 16 administrative regions and as of February 21, 2022, the reported case count stood at 158,220. Out of this, 156,429 persons were reported as having recovered and 1,433 officially declared dead [5]. In the quest to reduce the harmful effects of the pandemic, control measures have been used to contain and reduce the spread of disease, including lockdowns, the prohibition of social gatherings, trade and travel restrictions, closure of educational institutions, border closures, quarantines, and curfews [6]. Although some of these restrictions have been effective in containing the spread of the disease some measures have had unintended consequences, especially for women and children [6].

Studies have shown that in general, the COVID-19 pandemic has affected the wellbeing of children and women, in Ghana and significantly impacted their financial security, food security and nutrition, access to health interventions, education, protection, as well as access to water, sanitation, and hygiene (WASH) [7]. According to UNICEF more than half of Ghanaian children (ages 6 months to 14 years) living in households where providers had to stop working due to COVID-19 control measures had fewer meals than usual, mostly because they stopped receiving meals from school feeding programmes because to school closures [7]. Another major concern about the lockdown and school closures was its impact on children's mental health and emotional distress. Many children were confined to their households, sometimes in violent or stressful environments, without the ability to socialise with other children, which affected their wellbeing [7]. Women also suffered an increase in violence from their intimate partners during lockdown [8] and reduced antenatal care (ANC) services due to COVID-19 [7]. UNICEF Ghana's [7] report revealed that about half of women who were not attending any ANC visits attributed their reasons to the fear being infected by the coronavirus at health facilities.

Most Ghanaians have experienced the direct and indirect impacts of COVID-19 control measures, from the toddler who could not attend nursery, to the grandmother who was compelled to stay away from her own close family members [9]. While the primary effects of the pandemic on children appear limited, children are highly susceptible to the indirect secondary effects of the pandemic because of strained service systems, household income shocks and disruptions to social services and care networks, educational progress and timely essential health services [10, 11]. Some documented indirect impacts of COVID-19 controls measures include dropping out of school, rise in adolescent pregnancies and a decline in learning outcomes. There has been also an increase in the number of women who experienced gender-based violence, and those who became breadwinners as their husbands lost their jobs [11].

As evidenced from the studies reviewed above women and children are among the most affected by COVID-19 but the unintended consequences of the lockdown and other control measures on women and children are still largely underexplored. The aim of this study was to interrogate the impact of lockdown measures on women and children in two contrasting districts in Ghana – Krobo Odumase and Ayawaso West Wuogon.

Methods

Research design

This study adopted the mixed-method approach including a case study. By definition, a case study according to

Table 1 Interviews conducted in Krobo Odumase (KO) and Ayawaso West Wagon (AWW)

Data	Krobo Odumase	Ayawaso West Wagon	Total
HHS	40	38	**78**
FGD	6	6	**12**
KII – Districts	7	5	**13**
KII – National			**5**
Total	**53**	**49**	**107**

Source: Authors' construction.

Table 2 Breakdown of people and groups interviewed

	Participants	KO	AWW
FGD			
	Adolescent Males	10	10
	Adolescent Females	9	10
	Adult Males	11	13
	Adult Females	12	14
	Community Leaders	11	10
	Health Workers	12	11
KII - District			
	Teachers		
	School Health Programme (SHEP) Coordinator		
	Medical Officers		
	Municipal Health Director		
	Civil Society Organization (CSO)		
KII - National			
	AIDS Control Programme Manager		
	Ghana Education Service (GES) SHEP Coordinator		
	National Media Practitioner		
	Ministry of Gender, Children and Social Protection		
	TB Control Programme Manager		

Source: Authors' Construct.

Creswell [20] is "a design inquiry found in many fields, especially evaluation, in which the researchers develop in-depth analysis of the case, often a programme, event, activity, process or, one or more individuals. Cases are bounded by time and activity, and researchers collect detailed information using a variety of data collection procedures over a sustained period of time". As mentioned in the definition it is time bound and based on activity as this study portrays. In this study policy documents related to COVID-19 control measures were used as cases to complement the qualitative data as well as the quantitative data. Therefore, following the pragmatic research paradigm, both qualitative and quantitative data were used and triangulated. The qualitative study relied on two data collection methods to explore the impacts of COVID-19 control measures on women and children in Ghana. These were: focus group discussions (FGDs) and Key Informant Interviews (KIIs). The KIIs were conducted at both district and national levels. The qualitative data was analysed using the thematic approach with the NVIVO data analysis software. The themes were collectively generated by the authors based on the objectives of the study and the transcribed data. Thus, we started with deductive coding and ended up with inductive coding since we ended up adding themes from the obtained data. A breakdown of interviews conducted in each study area are presented in Tables 1 and 2.

Quantitative data was gathered from household surveys (HHS). This was a primary data constituting of both open and closed-ended questions. Forty (40) household surveys (HHS) were conducted in the rural site of Krobo Odumase from the 3rd to the 5th of May, 2021 while 38 were in Ayawaso West Wuogon, an urban area from the 11th to the 14th of May,2021. A "convenient random" [1] sampling was done to sample the households head with school going children. In each of the households we interviewed the two people from the household – the head (bread winner who were mostly males) and the assistant or guardian. The HHS data was taken using the KoboCollect App and exported from KoboCollect to Microsoft Excel version 2016 for analysis. We analysed the quantitative data using frequencies and percentages to support the nutrition and school closure data. The inclusion criteria used for the HHS respondents who were community members who had children of school going age. In addition, data under evolution of COVID-19 in Ghana was extracted from WHO's database on daily records of COVID. Policy data consisting of government responses to COVID-19 in Ghana from official government websites, newspapers, press releases and other publications, were also reviewed. The policy data included policies on transmission control, namely case detection, contact tracing, and isolation/quarantine, lockdown policies, lockdown implementation and effectiveness, hygiene, and physical distancing. All these secondary data were collected from January to June 2021. Also included in the dataset were policies aimed at preparing and enabling the health system to cope with COVID-19 and effects of lockdown, and mitigation of COVID-19 transmission control measures.

Study area and setting

A study was carried out in two sites – Ayawaso West Wuogon (AWW), an urban area from the 11th May to 21st June 2021 and Krobo Odumase (KO), a rural site from the 3rd to the 9th of May, 2021. Ayawaso West Wuogon is located in Greater Accra region, and has a population of 75,303. About 51.3% (38,614) of inhabitants are males compared to 48.7% (36,689) of males [12]. The main economic activities in AWW include urban agriculture and manufacturing [13]. AWW has two government hospitals, two private hospitals, 27 Clinic, six health centres and one maternity home (all government). Krobo

[1] We randomly selected the households and interviewed those who were readily available.

Odumase is located in the Lower Manya Krobo Municipality of the Eastern Region of Ghana. According to the 2021 population and housing census, it covers a total land mass of 121,705, with inhabitants of which 46.6% (56,662) are males and 53.4% (64,816) are females (GSS, 2021). The main economic activities in the area include agriculture, tourism, small-scale trade and bead making [14]. The area has two major hospitals (Atua Government Hospital and St. Martins Hospital), private clinics and maternity homes, and four government reproductive and child health facilities at Odumase, Kpong, Asitey, Oborpah and Akuse [15].

The health facilities were purposively sampled. In that, all the facilities sampled for this study were the facilities designated by the government for receiving and treating COVID-19 suspected and confirmed case. The health facilities in both study sites provide both preventive and curative health services such as maternal and child health, and communicable and non-communicable diseases. The AWW was selected because it was regarded as one of the hotspots of COVID-19 and experienced lockdown, while Krobo Odumase recorded many COVID cases but did not experience lockdown, although it was highly affected by the lockdown due to its closeness to the Greater Accra region. KO was selected to study the general impact of COVID 19 on the general public while AWW was selected to understand the impact of the lockdown measures which was the focus of this study so as to differentiate the impact of COVID 19 in general from the impact of the lockdown in particular.

The interviews presented in Table 1 were conducted in different languages. For the Krobo Odumase site, discussions were conducted in 'Krobo'[2] for FGDs and English for all KIIs. For Ayawaso West Wuogon, the FDGs were conducted in 'Twi'[3] while English was used for all KIIs. All interviews with national actors were conducted in English. Interviews were recorded and transcribed. Hence, interviews were recorded, and translation was done directly while transcribing. Interviews conducted in Krobo and Twi were translated and transcribed into English by the research assistants who are native speakers of these languages.

Description of participants

Participants who were involved in the qualitative study were of different social statuses. A breakdown of people and groups interviewed is presented in Table 2.

The FGDs (Table 2) consisted of adolescents, ages 13–17 years, both males and females and adult males and females from different communities. Community leaders involved in the FGDs included members of the district assembly, a linguist, teachers, a market women's representative (Market Queen), a representative of the Queen Mother's Association, a Chief and a Unit Committee Chair. Krobo Odumase is more of a traditional area, so the community leaders were mostly traditional leaders. Unlike KO, community leaders included in the FDG in AWW were assemblypersons from various communities in the municipality. FDGs held with health workers were composed of general and public health nurses, lab technicians, pharmacists, physician assistants, nurses in charge of COVID-19 centres, and midwives. The inclusion criteria for selecting the general public for FGD was parents with children in school and the children themselves whose parents were selected. For the parents who were selected, we relied on the disease control officers in the communities. Parents who did not have children in school were excluded from the FGD because the focus of the study was on mothers and children. Convenient sampling technique was used to select 12 participants who fell within the inclusion criteria for the FGD session. Thus those who were willing and available to be included in the FGD session were recruited at their convenience.

For the key informants, purposive sampling was used to recruit them for the study. This was because they formed part of health facility in-charges, policy makers, community leaders and frontliners in the COVID 19 control programme who could provide the information needed for the study.

Ethical considerations

The study obtained ethical approval from the Institutional Review Board of the Noguchi Memorial Institute for Medical Research, University of Ghana. Written informed consent was obtained from all the participants and participation was voluntary. Anonymity was ensured since the participants' identifying information was not audio recorded during data collection, neither were their names taken. To maintain confidentiality data was only accessed by the research team and not used for any other purpose. The FGDs were held in accordance with the COVID-19 prevention guidelines obtaining in the country thus physical distancing was observed and participants provided with face masks and hand sanitizers.

Findings

Evolution of the COVID-19 pandemic in Ghana

The data presented in Figs. 1 and 2 was extracted from the coronavirus dashboard on Ghana on WHO's website. Figure 1 shows Covid 19 new cases while Fig. 2 depicts Covid-19 deaths for the year 2020–2022.

[2] Krobo is the local language spoken by the people of Krobo Odumase. It is one of the widely spoken languages in Ghana.

[3] Twi is the most widely local language spoken in Ghana.

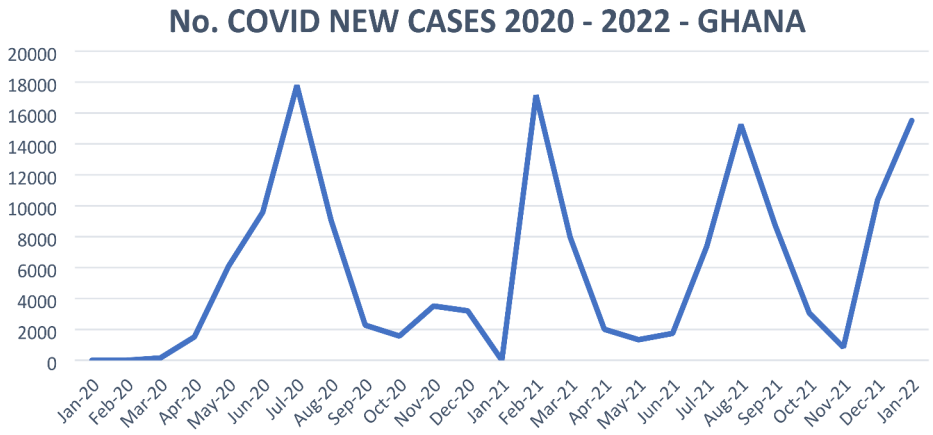

Fig. 1 Time series line graph of COVID Cases in Ghana – 2020–2022. Source: constructed by authors from WHO, 2022 [16]

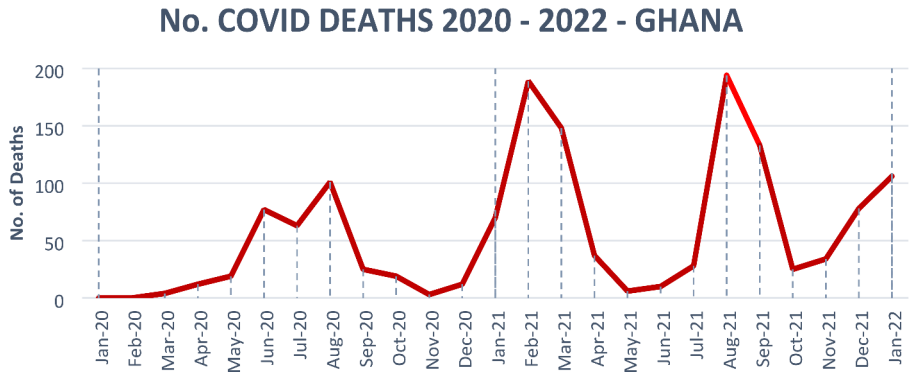

Fig. 2 Time series line graph of COVID Deaths in Ghana – 2020–2022. Source: constructed from WHO, 2022 [16]

Cases and death of COVID-19 recorded in 2020–2022

Data compiled shows that two cases of coronavirus were first identified in Ghana and announced to the general public on March 12, 2020 by the Ministry of Health. Also, the study found that the incidence[4] rate for COVID-19 kept increasing from the month of March to July in 2020. However, from August to December 2020, the number of new cases reduced. A similar pattern was observed for the number of COVID-19 deaths recorded in 2020.

A different wave of the spread of the virus was observed in 2021. In January ($n=10656$) and February ($n=17159$) Ghana recorded its highest COVID-19 cases. General elections in December 2020 during which period political parties held rallies, and the Christmas holidays were a likely contributory factor to the rise in cases. As the country approached December 2021, the number of new cases and deaths recorded kept fluctuating (see Fig. 2.0).

It can be deduced that as COVID-19 cases increased, the total number of COVID deaths also increased. Finally, the data revealed that as the country transitioned into a new year, the total number of cases increased.

Government responses to COVID-19 in Ghana

Policy timeline before first two cases

The study found that when the Ghana government became aware of the outbreak of COVID-19 in China, even before the first cases were recorded, measures were initiated to avert infection. In the early days of January 2020, the government activated the Public Health Emergency Operation Center (PHEOC) to begin planning and coordinating activities with key stakeholders. Table 2 reveals the policy timelines before the first cases were recorded.

It can be deduced from Table 3 that the aim of the government was to limit and stop the importation of the virus from other countries into Ghana, consequently, on March 11, 2020 a ban was imposed on all international travel by all public officials except for critical assignments. Following the first recorded cases, further restrictions were imposed to contain the spread of the virus throughout March 2020, including the closure of borders to neighbouring countries and school closures (see Table 4).

[4] Incidence rate = (number of new cases/total population) * 100.

Table 3 Policy timelines before first two COVID-19 cases were recorded in Ghana

January, 2020	February, 2020	March, 2020
Early/1: Activation of Public Health Emergency Operation Centre (PHEOC) for planning and coordination of COVID-19 activities	**27/2**: MOH issues press repeating information on precautionary measures.	**5/3**: MOH releases press statement maintaining that test on suspected case of COVID-19 at Korle-Bu Hospital was negative.
24/1: MOH announces the outbreak of COVID-19 in Wuhan, China and information on precautionary measures: hand washing, use of sanitizers, covering of the mouth and nose while sneezing/coughing, and self-quarantining if arriving from a country with COVID-19 cases.	**28/2**: National Commission for Civic Education (NCCE) started social media campaign on it handles.	**6/3**: President includes update on government measures to prevent COVID-19 outbreak in speech to mark Independence Day
		11/3: President gives first national address on COVID-19 preparedness with the following highlights: Screening and ban on all international travel by all public officials except for critical assignments.

Source: Authors' own construct, 2021

Policy timeline after first two cases of COVID

Table 4 indicates COVID-19 control measures in the areas of governance, transmission control and isolation/quarantine and lockdown policies. These measures were implemented after two cases were detected and contact tracing rolled out across the country especially in Greater Kumasi and Accra, which encompasses one of our study sites (AWW).

Findings from qualitative study

Government response to COVID-19 - stakeholder engagements

Findings from key informant interviews (KIIs) revealed that the government's response to COVID-19 was consultative and done with other stakeholders (both local and international). Interviews with key informants revealed that consultations were held within and among government ministries such as the Ministry of Education, Ministry of Health and Ministry of Interior. This is what one participant had to say:

> *"...so, all these people were involved: the Ministry of Education, Ministry of Health, Ministry of Interior, Ministry of Energy, the Ministry of National Security were all involved and the President had to chair most of the meetings so that they could think of the best things they could do to support the system." (GHNATKIIMEDIA, 2021).*

Another participant indicated the following:

> *"I heard the World Health Organisation, for instance, came up with communiques and advices on what government and the rest should do so that the COVID will not spread that much." (GHAKOKI-IPRIVSCH).*

Contrary to the views presented above, the community leaders and some of the community members said they were not consulted, and some saw the measures as poorly implemented.

> *"To me the government didn't do any proper consultation. We were not even included" (GHKOFG-DCLP4). "They did not consult us, the sharing of the food was very poor especially for the Kayayos. The way they were sharing the food was even exposing the girls to the COVID (GHAWWFGDAFP1).*

Impact of COVID-19 on health and health systems

The data shows that COVID-19 in Ghana had both positive and negative impacts on the general health of Ghanaians and the health system as a whole.

Impact on general health

Positive impact of COVID-19 on the general health of ghanaians

Improved eating habits and personal hygiene practices

Some FGD participants mentioned they have improved their eating habits such as eating a lot of fruits and warm foods to boost their immune system. Also, the FDGs revealed that some people have adopted good personal hygiene practices such as regular washing and sanitising of the hands, which has reduced infectious diseases like cholera. This was expressed by a community leader as follows:

> *"...my observation is that we no longer experience cholera as it used to be because of the washing of hands frequently. Initially we were having cholera around, each child you see had it but now it is no more because of the control measures." (GHKOFG-DCLP8).*

Confirming the reduction in cholera cases a health worker **(GHAKOFGDHWP4)** further indicated a reduction in respiratory diseases, explaining as follows:

Table 4 Policy timelines after first two COVID-19 cases were recorded in Ghana

Governance	Transmission Control (Detection, Tracing & Isolation/Quarantine	Lock down policies
12/3: First cases of COVID-19 announced by the MOH.	**12/3**: Confirmation of first two cases took over 24 h to isolate the patients or initiate contact tracing. Active case detection and contact tracing began to be rolled out across the country, especially in designated hotspots. There were two main COVID-19 diagnostic centres, with three satellites (Noguchi Memorial Institute for Medical Research and Kumasi Centre for Collaborative Research).	**Education** **16/3**: Schools closed. Only final year exam candidates were allowed to remain. National examinations were suspended.
15/3: President addressed the nation and announced the prohibition of public gatherings of more than 25 persons, including for funerals, church services, workshops and conferences.		**Retail / Restaurants**, **cafes**, **bars / Recreational** **16/3–20/4**: non-essential shops closed; shops selling water and food allowed to begin operations in the lockdown areas. Markets only allowed food sellers. To facilitate PD, traders alternated days to sell at the market.
18/3: Ministry of Information begins to host weekly (later bi-weekly) briefings to provide situational update		**30/3–20/4**: Parks and beaches closed
18/3: Minister for Local Government announces the start of media campaign to sensitize local communities on COVID-19 and sanitary measures in public places to comply with COVID-19 protocols		**26/4**: Suspension of all public and social gatherings extended by another two weeks
19/3: National Preparedness and Response Plan launched; and a State of Natural Disaster announced.		
19/3: National Disaster Management Organisation (NADMO) starts sensitization of the public on COVID-19 on its social media handles.		
20/3: The 'Imposition of Restrictions' Law passed in Parliament under a certificate of emergency.		
22/3: Government orders closure of Ghana's land, sea, and air borders effective midnight		

Source: Authors' own construct, 2021.

"For some time, we have not recorded cholera and we will not because of washing of hands hygienic practices. When it comes to respiratory conditions, you will notice that other colds are minimized because of the masking. Limitation and social distancing reduce the likelihood of communicable transmission and all these have helped" (GHNATKIIAIDSProg).

Negative impact on the general health of ghanaians

Death One direct negative impact of COVID-19 on the health of people was that it led to death. In both study sites some participants said that they had lost relatives to COVID-19. This is what a participant had to say;

"...we were educated to go out to also educate the people in the community on how dangerous the virus was. Personally, my father died from the COVID and I was using that as an example to them." (GHAWFGDCLP5).

Depression and fear We also discovered that some people had mental health issues such as depression and fear. For instance, people were fearful of being infected with the virus and switched from accessing health care from hospitals to over-the-counter license chemical shops and pharmacies, thus increasing the risk of drug abuse. These excerpts from interviews from participants are illustrative:

"I was very depressed. My family and I have suffered serious depression. My church collapsed likewise my music ministry as a result of the pandemic." (GHKOFGDAMP4).

A female from AWW added;

"Patients presenting with malaria found it difficult to report to the hospitals due to the fear of coronavirus. These people stay home and self-medicate using both conventional and herbal drugs." (GHAWFDGAFP).*

Abuse of alcohol Another effect of COVID-19 and the impact of control measures is the increase in alcohol consumption, especially in the rural areas of Krobo Odumase (KO). The study found that some people misinterpreted the use of alcohol-based hand sanitizers as a preventative measure for the virus as a sign that all forms of alcohol could protect against the disease. As a consequence, some abused alcohol by drinking it with the aim of protecting themselves from getting infected. This is what one female FGD participant from KO had to say:

> *"Before the COVID, some people had not tasted alcohol before but during the COVID, they became drunkards." (GHAKOFGDAdP1).*

Impact on health system

Pressure on health system COVID-19 and lockdown measures had diverse impacts on the health system in both study sites. In KO some health facilities were closed due to COVID-19 infection of staff. This resulted in additional patient burden on the Atua Government Hospital, the largest hospital in KO. One participants explained:

> *"The facility was a bit pressured and the pressure was due to closure of some neighbouring facilities which actually closed down because some staff were infected and they had to close down or shut down the entire facility for the purpose of fumigation and other things." (GHKOFGDHWP10).*

In Ayawaso West Wuogun (AWW), pressure on the health system was due to the fact that testing facilities were too small to cater for the number of clients who needed testing. According to a participant:

> *"The whole exercise was stressful and draining. We come to work at 7am and close at 11pm." (GHAWFGDHWP9).*

Shift of focus from other infectious diseases to COVID-19 Secondly, there was a shift in focus on infectious diseases such as Malaria, Tuberculosis (TB), and HIV/AIDS to COVID-19. In this regard health workers attributed coughing and any disease with similar symptoms to COVID-19. This reduced visits to hospitals as people feared that their conditions could be mistaken for COVID-19. This is what one participant had to say:

> *"My senior daughter got sick and we took her to the hospital and the doctors were insisting of testing her for Covid 19. So instead of treating her for diabetes they were insisting on testing for Covid 19. This disrupted the care they were supposed to give her." (Survey Data-AWW, 2021).*

One health worker also stated that;

> *"...when people come to the hospital, instead of us to test for malaria and treat them on malaria, we might be thinking... because of the symptoms with Covid are similar we might be thinking it is Covid and you just take them to the Treatment Centre to be tested for Covid while it might be malaria." (GHKOFGDHWP5, 2021).*

Shortage of Logistics Thirdly, the health care system experienced shortage of logistics which affected the quality of their services. Although generally in AWW shortage of logistics was not a major problem, in KO there was a shortage of syringes and Personal Protective Equipment (PPEs) at many health facilities.

> *"There was shortage of DCG syringes. [...] We have SP (sulfadoxine-pyrimethamine), it is used to prevent malaria in pregnancy. It got short during the covid time [...] There was shortage of PPEs in the hospital and they were limited to only COVID centres." (GHAKOFGDHWP4).*

Indirect and direct impact on child health

COVID-19 and Children's wellbeing Children have been one vulnerable group affected by the COVID-19 lockdown measures in Ghana. Much of the indirect impacts of COVID-19 was through school closure, reduced income earnings of parents, increased cost of living and the social effects of lockdown on mental health. Since schools were closed and children had to stay at home for a year, their health was affected. In the household surveys we asked respondents to indicate if they think school closures had an impact on their children's wellbeing. The results are presented in Table 5.

Table 5 Impact of school closure on your children's health

Response	Frequency (*N* = 40)	Percentage (*N* = 40)
KO		
Yes	28	70
No	12	30
AWW		
Yes	28	70
No	12	30
Both Study Sites		
Yes	56	70
No	24	30

Source: Survey field data, 2021.

Children wellbeing Findings (Table 5) suggest that majority of our respondents in both study sites perceived school closures had impacted on their children's wellbeing. For instance, a respondent from KO mentioned that her children grew lean because they were home and had no food to eat. One adolescent put it this way;

> *"Before covid, we ate banku with fish. But now even if you want to eat banku, you are served without fish. They give you some slice of onion and tell you that this is your fish. Because of that many children have kwashiorkor." (GHKOFGDAdMP2).*

Nutrition The data shows that because the work of parents was adversely affected by the pandemic, many people had to reduce the quality and quantity of food they provided for their children. It was also discovered from the data that malnutrition was predominant in KO as compared to AWW as suggested in responses to the code children 'grow lean', and 'malnourished.' This run through KO data more than AWW. On the other hand, the 'code overweight' and 'eating too much' run through AWW data as compared with KO data. Supported by the survey data, this is what some participants had to say when we asked them what had changed in their children's wellbeing;

> *"They gained weight due to limited activity and overeating." (Survey field data- AWW, 2021); "I had to compel them to go on walks to reduce weight due to overeating." (Survey field data- AWW, 2021).*

Postnatal and Antenatal Care A direct impact on child health was the decline in antenatal and postnatal visits. It was evidenced from the data that, due to the fear of infection some mothers in KO stopped taking their children for immunisation. This was compounded by the fact that to reduce exposure to COVID-19, community health nurses stopped going to the communities to immunise children. However, centres such as the Child Welfare Clinic (CWC) were still operating at the facilities. This was reflected in the response of a health worker in KO as follows;

> *"…for the immunisation services, we realised that the health workers did not stop the services. We were there (at the hospital) every day but we realized that, the mothers themselves were not bringing their children to the facilities." (GHKOFGDHWP4).*

From the above narratives it could be concluded that the nurses were ready and stationed at the health facilities to carryout immunisation services but mothers were unwilling to send their babies because they feared they might be infected with the coronavirus.

The quantitative strand of the data showed that postnatal attendance at AWW also dropped even after the lockdown was over. For example, there was a decline in the number of children taken to the University Hospital at Legon for measles rubella vaccinations. The data revealed that recorded cases of immunisation had dropped from 120 in April, 2019 to 30 in April 2020. In the same facility, the 160 OPV/Polio vaccinations recorded in 2019 had dropped to 144 in 2020.

Direct and indirect impact on women and maternal health

Direct impact of COVID-19 on women

Decrease in ANC Visits Our interviews revealed that women and girls were the gender most affected by the pandemic. One direct impact of the lockdown on maternal health was a decrease in ANC visits because pregnant women who needed to access ANC services refused to do so for the fear of being infected with the virus. This is what a health worker from AWW had to say in this regard;

> *"Pregnant women were afraid to come to the hospital to access health care and it affected the quality of care we give to pregnant women." (GHAWFGDHWP2).*

Gender-Based Violence It was also revealed that, gender-based violence increased in both study sites. The increase in violence was attributed to the fact that some couples were unused to spending long periods of time together, but he lockdown confined them to their homes, thus increasing the likelihood of conflict. According to a health worker from AWW,

> *"Around that time too we realized that there was an increase in domestic violence cases due to the lockdown and staying at home. Some became depressed because they were used to being active all the time and so out of depression, they became [sic.] violent." (GHAWFDGHWP9).*

Indirect impact of COVID-19 on women

Economic hardship and nutrition The economic impact of lockdown had an indirect effect on the health of women and children in both study sites. The lockdown in Greater Accra, Kumasi and Kasoa led to an increase in prices of food prices which affected the quality of nutrition of some women and children. A community leader stated as follows;

"Our feeding and getting food stuff has now been a challenge. The prices shot up due to the fact that they (market women) also struggled a bit before transporting the foodstuffs to the market." (GHKOFGDCLP4).

FGD participant also added that;

"Food has been so difficult for us in such a way that we are unable to buy fish to cook for the family." (GHKOFGDAFP3); "life was great prior to the lockdown but during the lockdown we struggled to find food to eat." (GHAWFGDAFP).*

The narratives above reflected the economic difficulties some women in both study areas went through during the lockdown. It is important to note that, although there was no lockdown in KO, the lockdown in Accra indirectly affected women economically due to their proximity to the capital city.

General views and perceptions about the overall response to COVID-19

Relevance of control measures

This study revealed that people had different reactions, views and perceptions of COVID-19 control measures in the two study sites. Some participants were of the view that the control measures were useful notwithstanding the discomforts that accompanied them. For example, one participant **(GHNATGESSHEP)** perceived the lockdown as very necessary because it protected the country's borders. Some key informants described Ghana's COVID-19 strategies as restrictive, comparing it to other countries. This is how one key informant from AWW put it.

"...I observed the lockdown measures in Nigeria, Sierra Leone and Cote d'Iviore. If we are to compare [...] I see Ghana's control measures being more restrictive than the other countries especially when it comes to the border closures and then the system was put in place to deal with those issues (COVID)." (GHAWKIISO).

However, other participants did not see some of the measures, especially the lockdown, as needed and believed it adversely affected livelihoods and health.

"The lockdown was not so necessary and truly affected lives negatively." (GHAWKIIGESRO).

The study revealed that though the general views and perceptions were positive, some participants were not happy with the way the government and some community leaders went about implementing the measures. For instance, interventions such as feeding of the vulnerable, provision of PPEs and the disbursement of the COVID-19 support fund, put in place to support citizens were poorly executed and politicised.

Discussion

The study demonstrates that COVID-19 and its lockdown measures (implemented in the AWW and its indirect effects in KO which did not experience lockdown) had consequences on the health of women and children and the Ghanaian health system as a whole. Notable among these adverse effects were a decrease in childhood vaccinations, and in antenatal and postnatal attendance. Like in other studies [11], reports on COVID 19 showed a reduction in antenatal, and post-natal care services; nutrition and breastfeeding services; and information [11]. Like in other African countries such as Uganda [17] who recorded decreased antenatal and postnatal attendance, the decrease in antenatal and postnatal attendance was as a result of the fear of being infected with COVID-19 and a halt in CWCs. It is therefore important to note that the reduction and halt in CWC discouraged mothers from sending their children to hospital for antenatal care and other disease prevention practices. This could lead to vaccination preventable diseases among children and other health complications among the mothers should this happen again in future pandemics [17]. We observed through the COVID-19 experiences of our participants that "physical inactiveness" led to health conditions such as obesity, which remains a public health concern even among children. Thus, the long stay of children in their homes (physical inactiveness) due to school closure as a measure of controlling the spread of COVID 19 increased obesity among children in some parts of Ghana. Conversely, in other parts there was an increase in malnutrition due to the loss of livelihoods of parents and the fact that children could no longer benefit from school feeding programmes due to the closure of schools. However, these conditions were not only limited to physical inactiveness but also location and financial status of the parents which confirms the findings in Uganda [17] and Tanzania [18]. Thus, while children in the urban area surveyed for this study had issues with obesity because of inactivity and overeating, the rural side faced malnutrition [8].This brings to the fore how class and location could influence the health of mother and child in pandemics such as the COVID-19.

Furthermore, our study found that like other countries in Africa, the pandemic took the lives of many, especially as social events increased. Through the experiences of our participants, we discovered that seeking treatment for diseases such as TB, Malaria, and HIV reduced since some of the signs and symptoms are similar to that of

COVID-19. Participants who showed similar symptoms to such diseases mentioned that they feared it could be COVID-19 hence some resorted to Over-the-Counter (OTC) drug purchasing without prescription and other herbal medicine such as the drinking of tea made from the brewed leaves of Azadirachta indica, locally known as Neem tree.

Our study also found that some hospitals had to be closed down due to the fact that some health workers had been infected with COVID 19. A case of note was the death of an infected health worker in KO. The closure led to pressure on the few remaining hospitals, some of which were also turned into COVID 19 centers, and consequently, the need for additional logistics to cater for the increase in patronage. We found that some hospitals within our study sites often run out of logistics. Moreover, the few PPEs that were available were moved to the testing centers, leaving the OPDs and the wards in constant shortage for health staff to work with. We also discovered that the pressure on hospitals affected the well-being of health workers, especially as they had to work long hours. For instance, health workers from our study reported having to report to work earlier and closing later than their usual time. These findings were also corroborated by the UNICEF Ghana Report, 2020 [19].

More specifically, the lockdown measures had a differing effect on gender and poverty. We found that women were more affected by the lockdown and COVID-19 control measures than men. In Ghana, the lockdown impacted disproportionately on the vulnerable and the poor (especially those women who were dependent on cash income for their basic needs). This was predictable hence the government of Ghana implemented an intervention known as "feeding the vulnerable programme" to mitigate such impacts. Even though this initiative was appreciated by most respondents in our study, some shortcomings were identified. Some respondents were generally of the view that the "feeding the vulnerable programme", where the government provided free food for marginalised groups, including head potters (locally termed as "*kayayo*"), who were women, and the aged was poorly executed with beneficiaries crowding the distribution areas, and exacerbating the risk of transmission of Sars-Cov-2. In this regard policy makers did not pay enough attention to gender sensitive policies to mitigate the impact on women and the poor.

Children and young people in general were perceived as less at risk from COVID-19 compared with adults and the aged, but as our study found, they were possibly the most harmed by the impacts of lockdown and closure of schools. In Ghana, children's nutrition was affected due to loss of their parent's job and the closure of schools. This finding is in line with Oduro and Tsikata [8], who found that the nutritional status of children has a direct relationship with the socioeconomic status of their parents. Aside from nutrition, psychologically children were stressed since they had to study at home for a long time, and this had a toll on their mental health. This paper is of the view that the government paid attention to some of these impacts on children by providing food for children after resumption of school. However, it must be noted that the school feeding programs did not cover all levels of students who were affected by the lockdown measures across the country.

The feasibility and efficacy of lockdown and COVID-19 control measures was criticised by participants. For example, some observed that education on some of the infection control measures such as the use of alcohol-based hand sanitizer for hand hygiene was not backed by thorough public education. Some people, especially the youth, mistakenly thought drinking alcohol would protect them against the virus. Also worth noting was criticism that the government should have closed Ghana's borders earlier than it did and should have more effectively monitored unapproved routes into the country. Still the implementation of the lockdown actually helped to reduce the spread of the virus especially in urban areas such as AWW, although it had unintended consequences on the health of women and children.

Limitation of the study

A key limitation of this study is that, the results obtained from the two study sites cannot be generalised to other places in Ghana or beyond. However, lessons can be learnt from this study to understand how lockdown measures from pandemics can have unintended consequences on infants and maternal health. Another challenge of this study is the use of convenient sampling which may lead to limited representativeness and also increased risk of bias since participants were drawn based on convenience and not equal probability.

Conclusions

This case study employed mixed method techniques such as key informant interviews, focus group discussions, household surveys as well as secondary and grey literature in examining the effects of COVID-19, specifically lockdown and control measures on women and children's health. We can however conclude that government responded to COVID-19 using different strategies and that the outbreak of COVID-19 and its related policy response resulted in both intended and unintended consequences for especially women and children in Ghana. Key among the findings were: there was a reduction in visits for maternal health services such as antenatal and post-natal vaccinations, children's nutrition was affected due to loss of their parent's job and the closure of schools and women and children suffered abuse of various kinds

leading to psychological stress. The study has implications for national policy. National policy directions, for example, should ensure continuity of provision and patronage of child and maternal healthcare services which are essential health services during lockdowns. Governments should also think through policies such as measures to help improve food security so as to address women and children's health and nutrition given their vulnerability in society.

Abbreviations

ANC	Antenatal Care
AWW	Ayawaso West Wuogon
COVID-19	Coronavirus disease 2019
CWC	Child Welfare Clinic
FGD	Focused Group Discusion
GSS	Ghana Statistical Services
HSS	Household Surveys
KII	Key Informants Interviews
KO	Krobo Odumase
MOH	Ministry of Health
PPE	Personal Protective Equipment
PHEOC	Public Health Emergency Operation Centre
SP	Sulfadoxine-pyrimethamine
WASH	Water, Sanitation, and Hygiene

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Data availability
The primary data analysed in the current study are available upon reasonable request from the corresponding author due to anonymity and confidentiality.

Declarations

Ethics approval and consent to participate
All methods and protocols were performed in accordance with the relevant guidelines and regulations. Ethical approval was obtained from the Noguchi Memorial Institute for Medical Research Ethical Review Board (University of Ghana) (Clearance No: IRB 00001276). Written informed consent was obtained from all the participants and participation was voluntary.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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