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Effects of the Covid-19 on Essential Antenatal Health Services in the Buea Health District

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Abstract: The COVID-19 pandemic had overwhelming effects on every sector of life worldwide, particularly the health care sector. Healthcare systems especially of developing countries were taken off guard due to lack of preparedness against health emergencies such as the Covid-19. From February 14, 2020 when the ministry of public health in Cameroon declared the first Covid-19 case, the fear and anxiety that struck the general population, limited material, financial and human resources led to several challenges in healthcare provision and access. This study aimed at determining the effect of the Covid-19 pandemic (during the peak year, 2020) on access to a quality of EANC services, identify challenges faced in the provision of EANC service, and the adjustments made by public health facilities in BHD. The study design was both retrospective via hospital record review, and descriptive cross-sectional. A semi-structured questionnaire, and a checklist were used as data collection tools. Key informant sampling technique was used to identify potential participants, from 7 randomly selected public health facilities from each of the 7 Health Areas in BHD. SPSS v. 26 was used for data analysis. As results, 1368, 1615, 1727 and 1809 were the respective yearly ANC turnouts for 2018, 2019, 2020, and 2021. The percentage increase in ANC turnout between the respective years is +18.06%, +6.93%, +4.75%. The average ANC quality in 2018, 2019, 2020, and 2021 was 96.9%, 99.4%, 93.9% and 98.9% respectively. A P-value= 0.213 shows that there was no significant association between turnout and quality of ANC services from 2018-2021 using a Pearson's chi-squared test. 71.4% of study participant said they fell short of PPE, 57.1% and 85.6% identified anxiety related to fear of contracting Covid-19 amongst health workers and pregnant women respectively. The boost in the supply of PPE (85.7%), and regularly contacting of pregnant women for ANC (100%) were the major challenges made. In conclusion, the peak of the Covid-19 pandemic had a negative effect on ANC utilization given the decrease in percentage increase from 2019 to 2021 in turnout, and a slight decrease in quality of EANC services. The challenges faced by health workers were the lack of PPE, and fear among personnel and pregnant women. Increase communication with pregnant women, and provision of PPE were the major adjustments made to ANC during the peak of the Covid-19 in the Buea Health District.

Keywords: *Antenatal Care, Covid-19 Pandemic, Pregnant Women.*

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I. INTRODUCTION

Globally, about 529,000 women and adolescents die from pregnancy related complications yearly, giving an average global ratio of 400 maternal deaths per 100,000 live births. LMICs in Sub Saharan Africa account for about 99% of these deaths, with a lifetime risk of 1 maternal death in every 16 live births [1] [2]. The seven main causes of Maternal Mortality in the world today, include: indirect causes such as Pre-eclampsia/eclampsia, malaria and anemia which account for 20%, and direct causes such as hemorrhage (24%), sepsis (15%), unsafe abortion (13%), ectopic pregnancy, embolism, and anesthesia complications (8%), and 8% for obstructed labor [1]. Antenatal Care was identified as the primary medium for early clinical detection and management of malaria, anemia, pre-eclampsia (indirect causes of MM) and to a limited extent, obstructed labour, hence limiting more than 20% of MM, [2]. However, a MMR of less than 70 per 100,000 live births as targeted in millennium development goal three (MDG 3) is still far from reachable due to inadequate health care access to women in most developing countries in Africa [3]. MMR in Cameroon stands at 529 deaths per 100,000 live births due to mainly accessibility related challenges to healthcare [4].

The outbreak of the COVID-19 pandemic led to the anticipation that prospective mothers could encounter even more challenges gaining access to ANC services [5]. In terms of prevalence and maternal health impact of COVID-19 in Africa, the worst affected countries include South Africa, where a 3.4% rise in perinatal mortality and 5% decline in family planning services was noticed due to COVID-19 [6].

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Others are Liberia, Uganda, Zambia, and the Democratic Republic of Congo [7]. In spite of these, COVID-19 measures were instituted in a number of African countries such as South Africa [8], Kenya [9], Ghana [10] and Africa at large [11] [12] have extensively focused on how to cushion the citizens from the downturns in earnings and other similar measures to revamp the economy. Workable interventions to sustain and potentially even improve the ailing reproductive health system have been largely omitted in COVID-19 measures in Africa [13] [14]. This affirms the prediction by the UNFPA that during crises, reproductive health needs are likely to be overlooked [14]. This additional strain by Covid-19 on healthcare influenced most countries to make some adjustment to ANC services in order to allow for consistent healthcare to pregnant women during the surge (peak) of the pandemic in SSA [15].

II. MATERIALS AND METHODS

This study was both retrospective via review of records in ANC registers, collecting data from 2018 to 2021 using a checklist of seven (7) essential ANC indicators and cross-sectional using questionnaires to obtain information on challenges faced in ANC service provision, and adjustments made to enable quality care provision during the Covid-19 pandemic from selected participants. This research targeted health personnel as study participants, precisely, midwives and nurses in charge of planning and directing health services in these units in the respective public health facilities, from all seven Health Areas in Buea Health District. Data were collected from 1st to 30th May, 2022.

Buea Health District, located in Fako Division of the South West Region of Cameroon is made up of seven (07) health areas, namely: Bokwango, Bova, Buea road, Buea town, Molyko, Muea and Tole health areas. This study took place in public health facilities in the HAs offering ANC services. The choice of public health institution is due to the fact that these institutions serve a greater proportion of the population and most screening and treatment centres of Covid-19 were installed in state health institution. Buea has a surface area of approximately 870 square kilometers and an average climatic temperature of about 25 – 30ºC. Buea is classified as an urban region because it demonstrates changes in its economic and social characteristics which makes it a typical example of a region with population growth and increased political and social importance [16]. The Covid-19 pandemic has had an overwhelming effect more in urban than rural areas due to a greater portion of the population living in towns and cities [17].

This study included public health facilities with an ANC department, all health unit heads or assistants (nurses, midwives, or nurse/midwives), unit heads involved in ANC provision during the Covid-19 pandemic, and unit heads/assistant who gave their consent; and excluded private health facilities with or without an ANC department, medical doctors, laboratory scientists or technicians and other medical staff of the selected hospital. All seven (07) health areas were included in the study and seven (07) selected public health facilities (one per health area) were included in the study. Each ANC unit head for the select health facilities was included in the study. While ANC registers were the source of data collection for ANC quality assessment using a checklist of seven (7) indicators for essential ANC services. In health areas where there was more than one public health facility, one was selected using the balloting method of SRS. Meanwhile, the lone public health facility in a given HA was simply included in the study.

To carry out the study, an ethical clearance was obtained from the Institutional Review Board of the Faculty of Health Sciences, University of Buea. Then administrative approval was obtained from the Faculty of Health Sciences, University of Buea, the regional delegation of public health (No. 427/432), the district health officer, and from the director of the Buea Regional Hospital, the chief of centre of Buea Town Integrated Health Centre, the director of the sub divisional medical centre of Muea, the chief of centre of Bokova Integrated Health Centre, the chief of centre of Bokwango Integrated Health Centre, the chief of Moliko Integrated Health Centre, the chief of Tole Integrated Health Centre.

Only completely filled questionnaires were taken into account during data entry into the system. Data was entered in excel and analyzed using SPSS v.26. The average percentage of all the indicators for each year were considered as the quality of ANC services. It is also considered as the overall percentages of pregnant women who received EANC services per yearly turnout, for the four (04) consecutive years (2018, 2019, 2020, and 2021). An ANC quality of 80% was considered the cutting point for quality assessment; lower, meant less than 80% of the turnout for a particular year received quality ANC and is considered to be below standard. The analysis also generated a time series with respect to the turnout for the consecutive years. A Chi-squared test was computed to obtain associations between, the different years turnout and ANC quality. Analysis for challenges faced by health workers, and adjustments made to ANC were done via frequency distribution tables.

III. RESULTS

- *Demographic Characteristic of the Study Population*

71.4% of these participants were trained Nurses, as against two 28.6% who were trained midwives. With respect to gender, 71.4% of these participants were of the female gender, while 28.6% were male. The most of participants 42.9% were aged 35-40 years, 28.6% were aged 30-35 years, 14.3% was made of participants aged 25-30 years and 40-45 years respectively. The highest percentage of participants 57.1% had a State registered nurse (SRN) qualification, while 28.6% had BSc in nursing. 14.3% were nursing assistants (NA).

With respect to the duration of practice, the highest number of participants 28.6 % had > 5 years. 5-10 years and 10-15 years of experience respectively, while the least, 14.3 % had 15-20 years of experience. All these demographic characteristics are shown on table 1 below.

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Table 1 Numerical Representation of the Different Demographic Variables

Variables		N (%)	Mean
Gender	Male	2 (28.6)	
	Female	5 (71.4)	
Age range (years)	25-30	1 (14.3)	33-38 years
	30-35	2 (28.6)	
	35-40	3 (42.9)	
	40-45	1 (14.3)	
Education	NA	1 (14.3)	
	SRN	4 (57.1)	
	BSc	2 (28.6)	
Experience (years)	<5	2 (28.6)	9-13 years
	5-10	2 (28.6)	
	10-15	2 (28.6)	
	15-20	1 (14.3)	
Profession	Midwife	2 (28.6)	
	Nurse	5 (71.4)	

➢ *Units access to and quality of ANC services before, during, and after the peak year of the Covid-19 pandemic (2018-2021) in BHD*

- *Access to ANC (Turnout) for Each Health Facility per year*

From the figure 1 below, the BRH stands out to be the health area with the highest tornout of 3,246 pw for the four years followed by CMA Muea with a total of 1573 pw and the least being Tole IHC with a cumulative turnout total of 233 Pw across the 4 years.

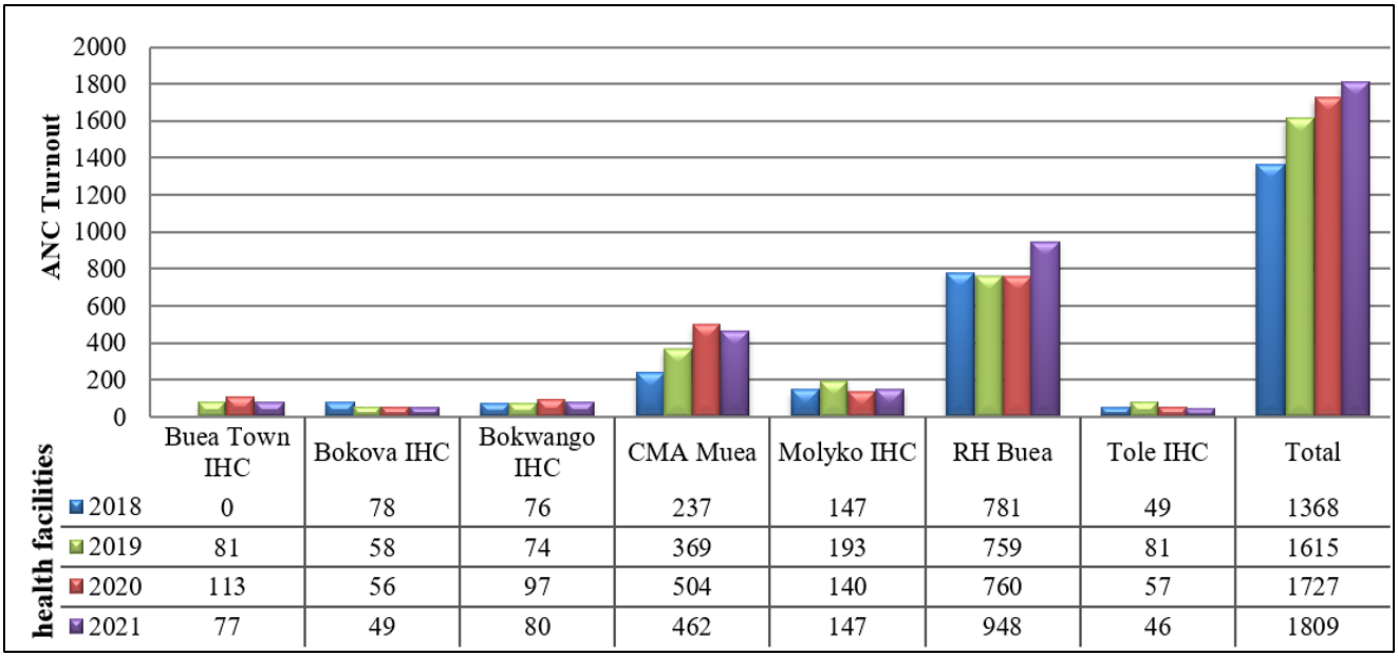

Fig 1 A Four Year Analysis of ANC Turnout per Selected Health Facility BHD

Table 2 shows the percentage changes in ANC utilization per public health facility per year before and during the Covid-19.

Table 2 Percentage Change in access to Essential ANC Services in terms of Turnout per Health Facility per year in BHD.

Health facilities	2018	2019	2020	2021
Buea Toown IHC	0	0	+39.51	-31.86
Bokova IHC	0	-25.64	-3.45	-12.5
Bokwango IHC	0	-2.63	+31.08	-17.52
CMA Muea	0	+55.70	+36.59	-8.33
Molyko IHC	0	+31.29	-27.46	+5
Regional Hospital Buea	0	-2.82	+0.13	+24.74
Tole IHC	0	+65.31	+29.63	-19.30

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Figure 2 below shows that though there was a consistent increase in the turnout per year from 1368 pregnant women in 2018 to 1615 pregnant women in 2019 and 1727 pregnant women in 2020 then 1809 pregnant women in 2021, there was also a +24.99% increase in ANC turnout from 2018 to 2020 (before the Covid-19 pandemic) and a +4.75% increase from 2020 to 2021.

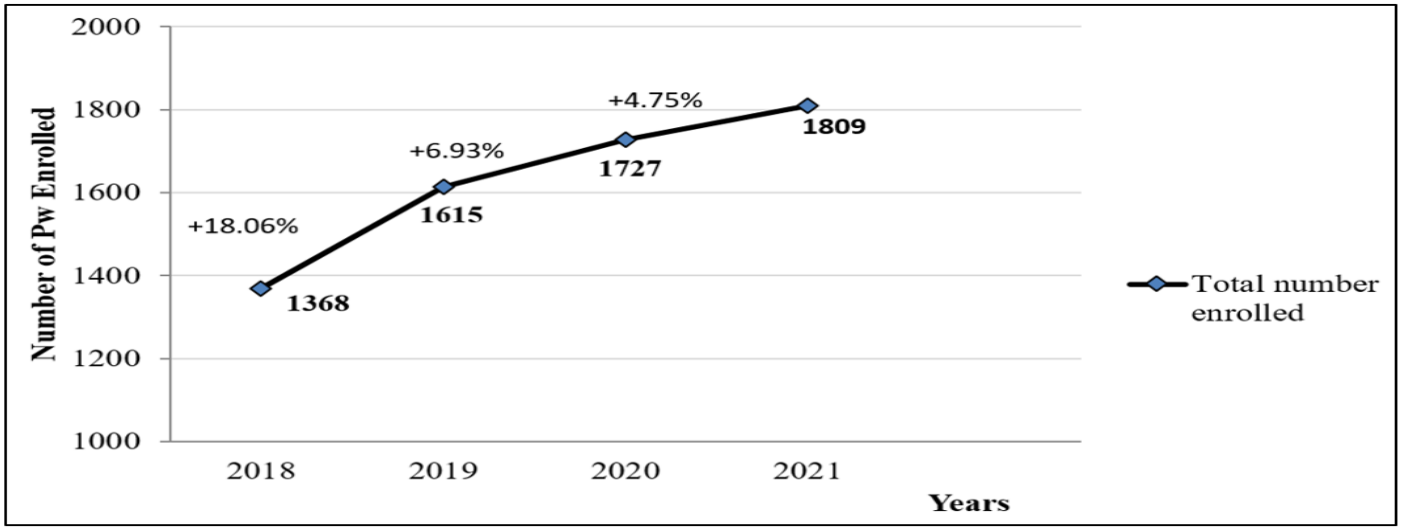

Fig 2 A Time series Illustrating Percentage Change in ANC Utilization (Turnout) before and During the Covid-19 Pandemic in the seven Selected Health Facilities in BHD.

- *Quality of ANC care*

Table 3 below illustrates the average ANC quality per year with 2018 having an average percent of (96.8%), 2019 (99.4%), 2020 (93.9%) and 2021 (98.9%).

Table 3 ANC Quality Assessment per Indicator for 2018, 2019, 2020 and 2021

Variables		2018 N (%)	2019 N (%)	2020 N (%)	2021 N (%)
EANC Quality	Vital sign follow-up	1351 (98.8)	1613 (99.9)	1596 (92.5)	1800 (99.6)
	Obstetric Physical Examination	1344 (98.3)	1608 (99.6)	1582 (91.7)	1785 (98.7)
	Iron suplement	1319 (96.5)	1608 (99.6)	1716 (99.4)	1805 (99.8)
	Routine Urine and HB analysis	1309 (95.8)	1606 (99.5)	1724 (99.9)	1767 (97.7)
	HIV Status	1230 (90.0)	1602 (99.3)	1578 (91.4)	1805 (99.8)
	IPT	1351 (98.8)	1605 (99.4)	1583 (91.7)	1785 (98.7)
	Blood group/Rh factor	1364 (99.8)	1593 (98.7)	1569 (90.9)	1776 (98.2)
Total		9268 (678.0)	11235 (696.1)	11348 (657.5)	12523 (692.6)
Mean EANC quality%		96.8	99.4	93.9	98.9

Figure 3 below is a time series representation of ANC quality for four consecutive years, 2018, 2019, 2020 and 2021 for the seven selected health facilities in Buea health district.

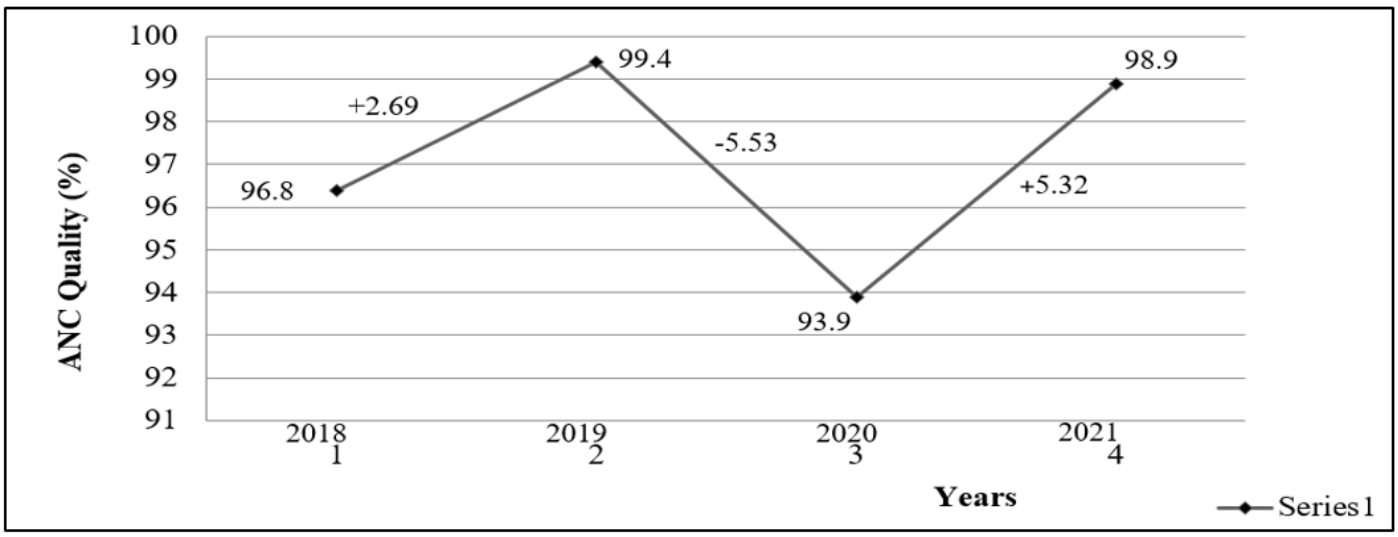

Fig 3 ANC Quality per Year in BHD

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Table 4 below illustrates the result of a cross tabulation between turnout and quality of ANC with an insignificant p value of 0.213.

Table 4 Association between the Turnout and Quality of ANC Services before, During

Years	Turnout	Quality of care N (%)	
2018	1368	1324 (96.9)	P-value= 0.213
2019	1615	1605 (99.4)	
2020	1727	1621 (93.9)	
2021	1809	1789 (98.9)	

- *Challenges faced by healthcare providers involved in ANC provision during the peak period of Covid-19 pandemic (2020) in BHD*

All (100%) of the participants admitted to have faced challenges with Non-attendance of ANC by PW related to fear Contracting Covid-19 having the highest rate of (85.7%) followed by Lack/shortage of protective equipment with (71.4%) and Shortage of personnel due to redeployment to Covid-19 unit having the least (14.3%.).

Table 5 Challenges faced by Healthcare Providers Involved in ANC Provision during the peak Period of Covid-19 Pandemic (2020-2021) in BHD

Variables		Response	
		Yes N (%)	No N (%)
Challenges faced by health workers during the Covid-19 peak	Whether or not you faced more challenges in 2020	7 (100.0)	0 (0)
	Lack/shortage of protective equipment.	5 (71.4)	2 (28.6)
	Shortage of personnel due to redeployment to Covid-19 unit.	1 (14.3)	6 (85.7)
	Anxiety related to fear of contracting Covid-19 among personnel.	4 (57.1)	3 (42.9)
	Non-attendance of ANC by Pw related to fear Contracting Covid-19.	6 (85.7)	1 (14.3)
	Personnel stay away from work due Fear related to Mandatory vaccination.	3 (42.9)	4 (57.1)

- *Adjustments made to ANC services in BHD during the peak period of the Covid-19 pandemic (2020-2021) in BHD.*

All 100% of the participants said adjustments were made with supply of personal protective equipment having the highest (85.7%) response, isolation of ANC units having (14.3%) and 37wks programmed deliveries having (0%) as seen on the table below.

Table 6 Adjustments made to Maintain or boost ANC Service Provision

Variables	Response	N (%)
Adjustments made	Yes	7 (100.0)
Supply of PPE	Yes	6 (85.7)
	No	1 (14.3)
Isolation of ANC unit	Yes	1(14.3)
	No	6 (85.7)
Institution of Home visits	Yes	3 (42.9)
	No	4 (57.1)
Regular contacting of PW	Yes	7 (100.0)
PW was offered PPE	Yes	4 (57.1)
	No	3 (42.9)
37 weeks programmed deliveries	No	7 (100.0)
Regular media dissemination of information	Yes	3 (42.9)
	No	4 (57.1)
Voluntary vaccination for Pw	Yes	4 (57.1)
	No	3 (42.9)

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IV. DISCUSSION

➢ *Demographic Data*

Majority of the participants 5 (71.4%) were trained nurses, as against 2 (28.6%) who were trained midwives. This is different from a similar study conducted in Kenya, where all the participant ANC unit heads were midwives. This differences could be due to the fact that there is a better recognition of specialization in other countries such as Kenya than Cameroon where nurses are trained to assume many roles [18].

The female gender dominated the number of study participants 5 (71.4%), while just 2 (28.6%) were male nurses or midwives. This again ties with the gender characteristic of a same study, where 100% of their participants were of the female gender [18]. The reason for this could be due to the fact that the nursing and midwifery profession are identified more by the female gender given the motherly and care demands of these profession [18].

The most of participants 3 (42.9%) were aged 35-40 years, 2 (28.6%) were aged 30-35 years, 1(14.3%) were made of participants aged 25-30 years and 40-45 years respectively, giving a mean age range of 33-38 years. This information is different from those of a similar study, where the mean age of participants was of 40-50 years. This could be as result of the inclusion of traditional birth attendant (TBAs) in the study carried out in Kenya. Most TBAs are often elderly women, hence this may have influenced the eventual higher mean age in their study [18]. The highest percentage of participants 4 (57.1%) had a State registered nurse (SRN) qualification, while 2 (28.6%) had BSc in nursing and 1 (14.3%) were nursing assistants (NA). This finding is different from that in Kenya where the highest number of participants were registered midwives. This could be due to high rate of professionalization in their study site where specialized midwives are more valued [18].

The highest number of participants (28.6 %) had > 5 years, 5-10 years and 10-15 years of experience respectively, while the least, (14.3 %) had 15-20 years of experience, giving the mean number of years of experience of 9-12 year. A similar study in Kenya had a greater mean with 15-25 years of experience for their study participants given the inclusion of TBAs in their study. TBAs have been found to be elderly women from numerous studies conducted in Africa with more years of experience [18].

➢ *Access to and Quality of ANC Services before and During the Covid-19 Pandemic in BHD.*

- *Turnout*

Generally, findings from this study show a consistent increase in ANC turnout of 1368, 1615, 1727 and 1809 for 2018, 2019, 2020, and 2021 respectively in BHD (figure 1). However, a critical analysis reveals a consistent decline in percentage increase per year as follows: +18.06% increase in ANC utilization from 2018 to 2019, +6.93% from 2019 to 2020 and just a +4.75% increase in ANC utilization from 2020 to 2021(table 2). This indicates an up to +20.24 % decrease in ANC utilization during the Covid-19 period. Similar findings were gotten from a study carried out among health facilities in the Buea municipality where results show up to a +13.1%, +29.2% and +38.3% decrease in health services utilization (hospital turnout) in April, May and June 2020 respectively during the Covid-19 pandemic when compared with respective months in 2019 before the Covid-19 pandemic [19]. This similarity could be due to the same study site. In addition, the overall slight increases per year could be accounted for by the fact that the Buea municipality is a town in one of the two regions in Cameroon that was not greatly hit by the socio-political instability, which has led to internally displaced persons fleeing from remote areas to safe cities with better security like Buea [20]. Findings here are similar to another study in Ethiopia, where results show up to a 70.7% decline in to ANC utilization [21]. This could be related to similarities in Covid-19 burden [22]. Two more international studies revealed a decline in ANC turnout (unquantified) [23] [24]. The outcomes of this study differ with those of another conducted in Congo, where results showed no decline in ANC turnout. This could be as a result of timely adjustments made to ANC in Congo during the Covid-19 pandemic [25]. About 5633 mobile and static clinics were closed down across 64 countries as a result of a greater Covid-19 pandemic burden in some countries [15] [26].

With respect to ANC utilization per health facility, the Regional Hospital Buea witnessed a +24.87% increase while the public integrated health centres did not experience any increase (table 2). These findings are similar to those of the study carried out in Cameroon-Buea, which indicated a +50.6% increase in hospital utilization for regional hospitals and Covid-19 treatment centres [19]. This similarity could be due to similarities in study sites [27]. This results do not however tie with the same study conducted in Buea indicating that there was an overall increase in health service utilization in medicalized and integrated health centres [19]. This difference could be due to fact that this study narrowed down health service utilization to the ANC department, as opposed to the other study which considered the overall utilization of health services in general.

- *Quality or Standard of ANC*

Table 3, illustrates the effectiveness with which each of the seven (07) indicators were put to use from ANC records 2018 to 2021. ANC quality in 2018, 2019, 2020, and 2021 was rated at an average of 96.9%, 99.4%, 93.9% and 98.9% respectively. Though the average standard of ANC care in 2020 recorded the lowest, it is above the 80% mark stated in the materials and methods. This complies with the results of the United states in 2021, where results illustrated as high as an ANC quality of care of 96.4% during the surge of the Covid-19 pandemic [28]. The maintenance of this high quality may have been due to timely measures such as effective communication, and adequate provision of protective materials by policy makers [28]. It could possibly also be as a result of a lesser Covid-19 burden in Cameroon as well as the effective implementation of guidelines put forward by WHO and the ministry of public health in these countries to fight against the Covid-19 Pandemic [29,30,31]. However, the 5.32% decrease in ANC quality in 2020 is similar to a study

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conducted in some African countries where findings revealed decrease in ANC quality (unquantified) in Ethiopia, Liberia, Mali, Malawi, Nigeria, Rwanda, Sierra Leone, Somalia, South Africa, Uganda shortage including Cameroon [32, 33]. This could have been due to poor knowledge of the Covid-19 pandemic among inhabitants of the Buea municipality [34, 35]. Dashraath, 2020 stated that the outbreak of the pandemic meant, the need for more material, human and financial resources which were not readily available at a time [36].

A Pearson's chi-squared test (Table 4) to determine whether or not there exist an association between turnout and quality of ANC from 2018-2021; the P-value= 0.213 obtained is greater than 0.05. This implies that there is no significant association between turnout and quality of ANC services from 2018-2021. ANC turnout and quality of ANC services are independent of the Covid-19 pandemic in BHD. There is no recent study have established a relationship between the peak period of the Covid-19 pandemic and access and quality of ANC.

- *Challenges faced by Healthcare Providers involved in ANC Provision During the peak Period of Covid-19 Pandemic (2020-2021) in BHD.*

All 100% of the participants accepted to have faced more Covid-19 related challenges. This is in line with the done in Kenya, where all the five unit heads in this study attested to have faced more challenges during the early peak of the covid-19. Up to 5 (71.4%) of unit heads from 7 different state owned health facilities said they fell short of protective materials, 4 (57.1%) of them identified anxiety related to fear amongst health workers, and 6 (85.6%) identified non-attendance of ANC by Pw due to fear of contracting the Covid-19 virus. This too is in line with same study, where all unit heads identified non-attendance of ANC by Pw due to fear and anxiety related to Covid-19 (Pw preferred tradition birth attendants) as a major challenge, non-availability of PPE in their health facilities as a second major challenge, and anxiety related to fear of contracting the Covid-19 infection as a third major challenge. This could be related to inadequate level of preparedness for health emergencies such the Covid-19 pandemic [37].

- *Adjustments Made to ANC Services in BHD During the Peak Period of the Covid-19 Pandemic (2020-2021) in BHD*

All 7(100%) unit heads from the 7 selected public health facilities in BHD, agreed to have had adjustments made for their respective health facilities. Among the adjustments made to boost the quality ANC during the surge and in the course of Covid-19 pandemic were regular contacting of Pw 7 (100%), 6 (85.7%) attested that more PPE were supplies to health workers, and 4 (57.1%) said Covid-19 vaccine was made voluntary in order to encourage ANC turnout. This is in line with the study carried in Kinshasa and South America, where similar adjustments were made [38]. However, different from the study conducted in Kinshasa, because only 14.3% of ANC unit heads attested that their units were isolated, Covid-19 related information were not adequately disseminated as attested by 4 (57.1%), and 7 (100%) attested that deliveries were not programmed (a measure to limit the exposure to the virus). This could have been due to the fact that, Cameroon like many LMIC, had limited material, human and financial resources in order to effect outstanding measures such as isolating ANC units. Also, deliveries could not be programed due to differences in study settings; the African believes in the natural onset of labours and not the artificial stimulation of labour commonly preferred in the western world once pregnancy is term. The communication system in Cameroon is not top notch as that in the UK where a similar study was carried out, hence the lapses in communication in BHD [39].

V. CONCLUSION

In conclusion, the findings of this research reveal that, there was a decline in access to ANC in terms of turnout and quality of EANC especially during the peak of the Covid-19 pandemic compared to previous years before the Covid-19 pandemic in the Buea municipality. A P-value= 0.213 shows that there was no significant association between turnout and quality of ANC services from 2018-2021 using a Pearson's chi-squared test.

Challenges such as lack of PPE, staff shortage, and anxiety related to fear (in both Health workers and Pw) of contracting Covid-19 were the major challenges faced by ANC health workers in BHD.

Adjustments such as a boost in the supply of PPE, regular communication with registered Pw and the switch from mandatory to voluntary vaccination for Pw, were made to bridge the gaps which might have threatened ANC access and quality during the Covid-19 pandemic in BHD.

REFERENCES

[1]. Nour NM. An introduction to Maternal Mortality. Rev Obstetrics and Gynaecology. 2008; 1(2).
[2]. Oyerinde K. Can Antenatal care Result in Significant Maternal Mortality Reduction in Developing countries. Journal of Community medicine and Health Education. 2013; 3(1).
[3]. WORLD BANK GROUP. Reproductive, Maternal, Newborn, and Child Health. 3rd ed. Black RE, Laxminarayan R, Temmerman M, Walker N, editors. Washington DC: Library of Congress; 2016.
[4]. World Data Atlas. knoema web site. [Online].; 2017 [cited 2017. Available from: HYPERLINK "knoema.come" knoema.come .
[5]. UNFPA maldives. The impact of COVID-19 on maternal health and family planning in maldives. [Online]. 3rd Floor,Shinetree Building, Boduthakurufaanu: UNFPA Maldives Country Office; 2020.
[6]. Initiative. CHA. Policy brief: maternal, neonatal lessons from the first and second waves of COVID-19 in South Africa. [Online]; 2021 [cited 2022 July 11. Available from: HYPERLINK " https://www.clintonhealthaccess.org/policy-brief-maternal-neonatal lessons-from-the-first-and-second-waves-of-covid-19-in-south-africa/ #_ftnref1 .

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may2250

[7]. CDC A. Outbreak brief #76: Coronavirus disease 2019 (COVID-19) pandemic. [Online].; 2021 [cited 2022 July 11. Available from: HYPERLINK "https://africacdc.org/download/outbreak-brief-76-coronavirus-disease-2019-covid-19-pandemic/ " https://africacdc.org/download/outbreak-brief-76-coronavirus-disease-2019-covid-19-pandemic/ .

[8]. Africa GoS. The South African economic reconstruction and recovery plan. [Online].; 2020 [cited 2022 July 11. Available from: HYPERLINK https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiBoKjhk_ztAhVMZMAKHaU3AY44FBAWMAB6BAgBEAI&url=https%3A%2F%2Fwww.gov.za%2Fsites%2Fdefault%2Ffiles%2Fgcis_document%2F202010%2Fsouth-african-economic-reconstruction-and-.

[9]. Ongwae PS OK. Kenya's response to COVID 19, a descriptive review. ;12(9):1–69. Glob J Health Sci. 2020; 12(9).

[10]. Dadzie CE RD. Economic relief through social safety nets during the COVID-19 crisis: the case of Ghana. [Online].; 2020 [cited 2022 July 11. Available from: HYPERLINK "https://blogs.worldbank.org/nasikiliza/economic-relief-through-social-safety-nets-duringcovid-19-crisis-case-ghana "

[11]. Policy PfE. Social and economic recovery and response from COVID-19 (SERRC). [Online].; 2020 [cited 2022 July 11. Available from: HYPERLINK "http://www.pep-net.org/social-economic-recovery-response-covid-19" http://www.pep-net.org/social-economic-recovery-response-covid-19 .

[12]. Ighobor K. UNDP working to help African countries recover from COVID-19. [Online].; 2020 [cited 2022 July 11. Available from: HYPERLINK "https://www.un.org/africarenewal/magazine/specialedition-covid-19/coronavirus/undp-support-recovery-african-economies-shattered-covid-19"

[13]. Samba ea. COVID-19 threatens sexual health of Africa's women. [Online].; 2020 [cited 2022 July 11. Available from: HYPERLINK "https://www.dw.com/en/africa-covid-19-sexual-healthwomen-family-planning-contraception-public-hiv-pregnant-risk-birth/a-54089774."

[14]. Welle D. COVID-19 pandemic threatens Africa's gains in reproductive healthcare. [Online].; 2020 [cited 2022 July 11. Available from: HYPERLINK " https://www.marketwatch.com/press-release/covid-19-pandemic-threatens-africas-gains-in-reproductive-healthcare-2020-07-11?mod=mw_more_headlines&tesla=y ."

[15]. Ogunkola ea. Rural communities in Africa should not be forgotten in response to COVID-19. International Journal of Health Planning and Management. 2020 August; 35(6): p. 1302-1305.

[16]. Sally Zain ea. "Effect of Urbanisation on Community-Managed Water Supply: Case Study of Buea, Cameroon." Community Development Journal. 2014 October; 49(4).

[17]. OECD Regional outlook 2021. OECDiLibrary. [Online].; 2021 [cited 2022 January 18. Available from: HYPERLINK "https://www. oecd-ilibrary.org" Error! Hyperlink reference not valid.

[18]. Ombere SO. Access to Maternal Health Services During the COVID-19 Pandemic: Experiences of indigent Mothers and Health Care Providers in Kilifi County, Kenya. Frotiers in Socilogy. 2021; 6(53).

[19]. Tendongfor Nicholas NRBMNYEOAACSM. The Impact of COVID-19 on Hospital Attendance and Perceived Stigmatization Towards Individuals with COVID-19 Like Symptoms in Buea Municipality, Cameroon. International Journal of Clinical and Experimental Medical Sciences. 2021 March ; 7(2).

[20]. Data Cameroon; l'information citoyenne au service de la cite. Data Cameroon. [Online]. Bamenda; 2020 [cited 2022 July 31. Available from: HYPERLINK http://www.datacameroon.com.

[21]. Tadesse E. Antenatal Care Services of Pregnant Women Attending Antenatal Care in Public Hospitals During the COVID-19 Pandemic Period. International Journal of Women's Health. 2020 December; 12.

[22]. Starker BK RMRTrTKJHMRFAAMKMK&RA. Status of the WHO recommended timing and frequency of antenatal care visits in Northern Bangladesh. 2020; 11(15).

[23]. Chmielewska ea. effects of the Covid-19 pandemic on Maternal and Perinatal outcomes:a systematic review and meta-analysis. Science direct. 2021 June; 9(6).

[24]. UNFPA maldives. The impact of COVID-19 on maternal health and family planning in maldives. 3rd Floor,Shinetree Building, Boduthakurufaanu:; 2020. Report No.: (960) 3316940.

[25]. Hategeka ea. Impact of the COVID-19 pandemic and response on the utilisation of health services in public facilities during the first wave in Kinshasa, the Democratic Republic f the Congo. BMJ Glob Health 2021;6:e005955. 2021; 6.

[26]. Ogunkola ea. Impact of COVID-19 pandemic on antenatal healthcare services in Sub-Saharan Africa. journal of ASELVIER. 2020 November; 2: p. 1-2.

[27]. Forlemu ea. Trends in the population knowledge, attitudes and practices toward COVID-19 in the Buea municipality two months after the onset of the pandemic in Cameroon. Pan African Medical journal. 2020 October; 37(134).

[28]. Burges ea. Pregnant Women's Reports of the Impact of Covid-19 on Pregnacy, Prenatal Care, and infant Feeding Plan. The American Journal of Maternal/Child Nursing. 2021 February; 46(1).

[29]. WHO and CDC. Country & Technical Guidance Coronavirus Dis. [Online].; 2021 [cited 2022 July 11. Available from: HYPERLINK "https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance"

[30]. Jeganathan S PLBMea. Adherence andacceptability of telehealth appointments for high-risk obstetrical patients during the coronavirus disease 2019 pandemic. Am J Obstet Gynecol MFM ;2:100233. 2020; 2.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25may2250

[31]. Stein D, Ward K, Cantelmo C. Health Policy Plus. [Online].; 2020 [cited 2022 February 3. Available from: HYPERLINK http://wwwhealthpolicyplus,com.
[32]. Ahmed T RAATea. The effect of COVID-19 on maternal newborn and child health (MNCH) services in Bangladesh Nigeria and South Africa: call for a contextualised pandemic Nigeria and South Africa: call for a contextualised pandemic response in LMICs. Int J Equity Health. 2020;12:1181–8.; 12(8).
[33]. Shapira G ATDSea. Disruptions in maternal and child health service utilization during COVID-19: analysis from eight sub-Saharan African countries.;36:1140–51. Health Policy Plan. 2020; 36(1140-51).
[34]. Forlemu ea. Trends in the population knowledge, attitudes and practices toward COVID-19 in the Buea municipality two months after the onset of the pandemic in Cameroon. Pan African Medical journal. 2020 October; 37(134).
[35]. Tendongfor Nicolas ea. COVID-19 knowledge, attitudes and practices in a conflict affected area of the South West Region of Cameroon. Pan African Medical Journal. 2020 May; 35(2).
[36]. Dashraath ea. Coronavirus disease 2019 (COVID-19) pandemic and pregnancy. Am J Obstet Gynecol. 2020; 222(6).
[37]. Elston JWT MAMFWGea. Impact of the Ebola outbreak on health systems and population health in Sierra Leone. J Public Health.. 2016 August; 38(4).
[38]. Hategeka ea. Impact of the COVID-19 pandemic and response on the utilisation of health services in public facilities during the first wave in Kinshasa, the Democratic Republic f the Congo. BMJ Glob Health 2021;6:e005955. 2021; 6.
[39]. Morhe EK AECDAEea. SARS-CoV-2 updates in a West African population and precautionarymeasures for sustaining quality antenatal care delivery. J Glob Health. 2020; 10(2).