



## INTRODUCTION

In September 2000, Zambia was one of the 189 member states of the United Nations to sign the Millennium Declaration that pledged to end extreme poverty and deprivation by 2015. This declaration led to the development of eight specific Millennium Development Goals (MDGs) (MNDP, 2020). Three of these MDGs relate specifically to health; Goal 4 – Reduce child mortality, Goal 5 – Improve maternal health and Goal 6 – Combat HIV/AIDS, malaria, and other diseases. As of 2015, twelve African Countries, including Zambia, have met their fourth MDG [1]

Infant and neonatal mortality rates have declined mainly due to Zambia scaling up many Maternal, Neonatal and Child health programmes and interventions such as antenatal care, immunisations, skilled birth attendants and infant and young child feeding practices [2]. Zambia has also implemented integrated management of childhood illnesses developed by WHO and UNICEF in the early 1990s to provide a holistic approach to managing a sick child. These efforts have likely contributed to the marked reduction in the child mortality as well as better health outcomes such as reduced childhood malnutrition and maternal mortality [15].

In order to achieve this, access to health care for children aged below five years (under-five children) is crucial and therefore, it is a major public health and development issue [6]. However, the outbreak of Covid-19 has come with its own challenges, some of them might impede on general health care delivery.

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causes a disease called coronavirus disease 2019 (COVID-19) [8]. Since its emergence in December 2019, SARS-CoV-2, has created a global pandemic that has led to over 1 million confirmed deaths to date worldwide [13].

Therefore, implementation of precautionary measures to contain the spread of this virus is being practiced throughout the globe, these include, social distancing, isolation and quarantine, community containment, national lockdowns, and travel restrictions. So far, these measures are helping to control and reduce the spread of COVID-19[5].

Zambia registered its first confirmed COVID-19 case on 18<sup>th</sup> March, 2020. By 20<sup>th</sup> October 2020, more than 15, 000 cases and 350 deaths were confirmed [20]. WHO guidelines necessary to help curb the spread of the disease have since been active, these include wearing of masks, social distancing and quarantine [21]. In addition to this, non-high risk or non-fatal health cases have been encouraged to be treated at home or via virtual medical meetings, hence, preventing regular visits of mother and child to under-five clinical visits in addition to the already existing barriers such as access to health care centres, availability of medical essentials and lack of skilled labour.

Five dimensions of access influence the course of action of the health seeking process these include; availability, accessibility, affordability, adequacy and acceptability especially vulnerable for a number of reasons. Problems of accessibility including distance long travel times to the health

facility transport and lack of bicycles remain key buyers to access in many areas [6] and now with the Covid-19 pandemic in our midst, access to these services will be the more complicated due to new social guidelines.

The impact of the pandemic on the health system affects service delivery in the health sector which provides essential services to the citizens including, but not limited to, provision of maternal and antenatal care, immunization, nutrition services, and testing. These services are beneficial to the most vulnerable groups in the society and the spread of the COVID-19 virus is likely to impact negatively on the provisions of these services as focus and efforts shifts towards controlling its spread [4].

Disruptions to essential health services such as essential immunisations and facility based services which are important for children have since the onset of the pandemic been reported by a 2020 WHO pulse survey (<http://www.euro.who.int/en/health-topics/Life-stage/child-and-adolescent-health/covid-19-and-children>). Similarly, a study in Nampula, Mozambique by Pires et al [12] which aimed to assess the impact of COVID-19 on access to maternal and child health services showed that COVID-19 had negative effects on maternal and child health access.

Access to child health services is an important determinant of child health [9] The sustainable development goal 3 was set to ensure equitable access to quality healthcare services worldwide. However, this target has been grossly interrupted

ever since the emergence of the coronavirus disease, also known as COVID-19, globally and low and middle-income countries have been invariably affected. This unprecedented event has placed even more burden on the already fragile health systems in Low-Middle Income Countries (LMICs) with a potential impact on access to healthcare services [11].

Although many studies have looked at how Covid-19 has affected the globe economically and also how it has crippled the worlds systems specially the health systems, little research has been done on the impact this pandemic has made to the access of health care in general and specifically to the under-five population. Furthermore, the study is important as it makes available qualitative and quantitative information as well as statistical estimates which enable governments, international organizations and other stakeholders to set priorities and plan national and global health strategies and interventions also at community level thereby assisting to put more radical policies to help improve access to health care in place as well as furthering understanding of the changing environment and therefore improves attitudes, behaviours and knowledge that may further drive the successful implementation and utilisation of such policies amidst the pandemic.

## MATERIALS AND METHODS

A cross-sectional design was picked as it reflects the current on-going situation of clinical care where under-five children are concerned in light of the Covid-19 pandemic. Lusaka was chosen as the province from which this research was done

because not only does it have the highest population which is currently at 2,191,225 people, but it is also one of the most affected Provinces by the Coronavirus pandemic. The study was done at Chawama First Level Hospital which based in a densely populated area of approximately 70,000 people.

All children below the age of five living in Chawama compound made up the study population from which a sampling frame of all under-five visits made by children below the age of 5 in the year 2021 was made. All under-five children who have visited the Chawama first level hospital for monthly under-five health care in 2021 up to the month of April, made up the study sample. This was a total of 700 visits. The sample size was calculated using a confidence level of 95% and the margin of error of 5% from the sample frame bringing the sample size to 249.

Non-probability sampling method of convenience sampling coupled with voluntary response sampling was used. The procedure of the sampling was asking all care takers of under-five children coming in if they were willing to take part of the study and only after consent from the caretaker was the questionnaire handed over to the care taker.

Verbal consent was initially obtained from the caretakers to the under-five children before any data collection was carried out, additionally, an introduction of the researcher and what we hoped to obtain and for what purpose was conveyed to the caretakers so that they can be fully aware and comfortable during data collection. For the

individuals who were unable to understand the questionnaire, an explanation as to what each question entails was rendered and in some cases the researcher helped the care takers who participated to fill in the questionnaire on their behalf after verbal exchange of information.

The data collection tools that were used were close-ended questionnaires for both caretakers of the under five children and health care workers, under-five cards and past records of under-five visitors from the Hospital.

### **Data Analysis**

In order to ensure validity and reliability of the research, statistical methods using excel and SPSS research tools were utilised, in doing so, relevant tables and figures have been used as visual aids to help understand the information collected.

### **Ethical Considerations**

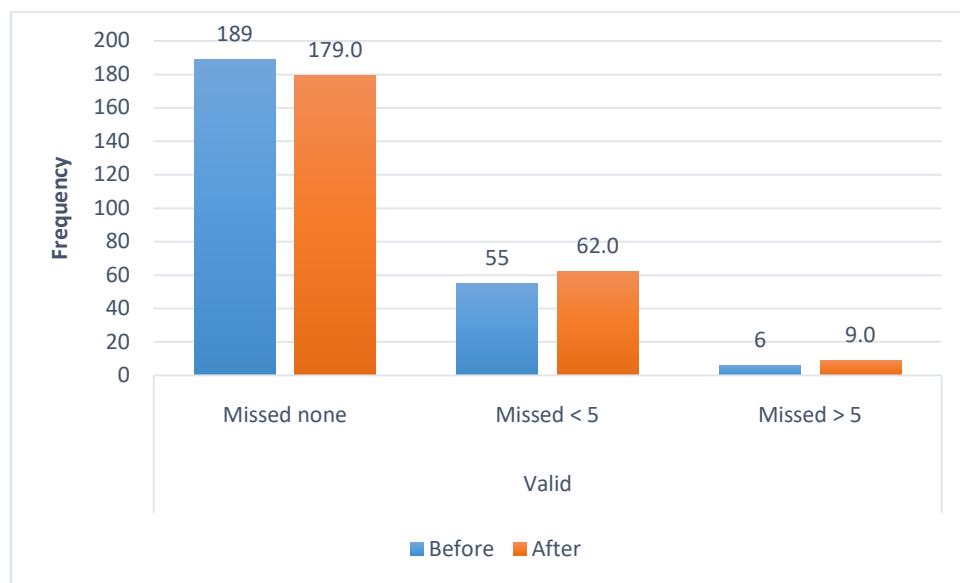
Ethical clearance was obtained from the University of Lusaka, additionally, a letter of consent was obtained from the Head of Public Health at Chawama First Level Hospital before data collection commenced. Furthermore, consent from the care takers who were to take part in the study was sought and those that took part in the data collection exercise did so willingly. Also, confidentiality of the participants was highly protected as we ensured that the questioners did not require any personal information such as names, occupation and place of residence and all information collected has been used strictly for the purpose for which it was intended.

## RESULTS

### 4.3.1 Level of Adherence to Under-5 Clinic Visits Before and After COVID-19

The results of this study revealed that there was a reduction in the number of individuals not missing the under-five clinic visits from 189 to 179, that is

percentage reduction of about 4%. Consequently, there was also an increase in the number of mothers missing less than 5 under-five clinic visits from 55 to 62 (percentage increase of 2.8%) and an increase in the frequency of mothers missing more than 5 under-five clinics from 6 to 9 (percentage increase of about 1.2%) (**Figure 1**).



**Figure 1** Level of Adherence to Under-5 Clinic Visits Before and After COVID-19

### Level of Adherence to Under-five Clinic Visits and Associated Factors before COVID-19

The study revealed that shortage of medical supplies ( $p$  value  $< 0.001$ ), having more than 2 children ( $p$  value = 0.009), level of education ( $p$  value  $< 0.001$ ) and lack of funds were significantly associated with missing an under-five clinic visit.

However, it is important to note that healthcare workers being busy ( $p$  value = 0.432) and marital status ( $p$  value = 0.348) were not associated with missing an under-five clinic visit (**Table 1**).

**Table 1** Association between Selected Variables and Missing Under-five Clinic Visits before COVID-19

		<i>Missed Under-5 Clinic Visits before COVID-19</i>			<i>P value</i>
		None	Missed < 5	Missed > 5	
<i>Healthcare Workers are Busy</i>	No	183 75.0%	55 22.5%	6 2.5%	0.432
	Yes	6 100.0%	0 0.0%	0 0.0%	
<i>Shortage of Medical Supplies</i>	No	189 76.5%	55 22.3%	3 1.2%	<0.001
	Yes	0 0.0%	0 0.0%	3 100.0%	
<i>Level of Education</i>	Primary	31 83.8%	3 8.1%	3 8.1%	<0.001
	Junior Secondary	105 85.4%	18 14.6%	0 0.0%	
	Senior Secondary	50 61.0%	32 39.0%	0 0.0%	
	Tertiary	3 37.5%	2 25.0%	3 37.5%	
<i>Number of Children</i>	≤2	135 81.3%	28 16.9%	3 1.8%	0.009
	>2	54 64.3%	27 32.1%	3 3.6%	
<i>Marital status</i>	Single	26 68.4%	12 31.6%	0 0.0%	0.348
	Married	157 76.2%	43 20.9%	6 2.9%	
	Other	6 100.0%	0 0.0%	0 0.0%	
<i>Lack of funds for transport</i>	No	180 83.7%	35 16.3%	0 0.0%	<0.001
	Yes	9 25.7%	20 57.1%	6 17.1%	

**Level of Adherence to Under-five Clinic Visits and Associated Factors after COVID-19**

Early impact of the coronavirus disease (COVID-19) pandemic and physical distancing measures on routine childhood vaccinations were significantly associated with missing an under-five clinic visit after COVID-19. However, it is important to note

that healthcare workers being busy (p value = 0.342), level of education (p value = 0.355) and marital status (p value = 0.103) were not associated with missing an under-five clinic visit (**Table 2**).

**Table 2** Association between Selected Variables and Missing Under-five Clinic Visits after COVID-19

		<i>Missed Under-5 Clinic Visits After COVID-19</i>			<i>P value</i>
		None	Missed < 5	Missed > 5	
<i>Healthcare Workers are Busy</i>	No	176	59	9	0.342
		72.1%	24.2%	3.7%	
	Yes	3	3	0	
		50.0%	50.0%	0.0%	
<i>Shortage of Medical Supplies</i>	No	179	62	6	<0.001
		72.5%	25.1%	2.4%	
	Yes	0	0	3	
		0.0%	0.0%	100.0%	
<i>Level of Education</i>	Primary	31	3	3	0.355
		83.8%	8.1%	8.1%	
	Junior Secondary	105	18	0	
		85.4%	14.6%	0.0%	
	Senior Secondary	40	39	3	
		48.8%	47.6%	37.5%	
	Tertiary	3	2	3	
		37.5%	25.0%	37.5%	
<i>Number of Children</i>	<=2	127	36	3	0.019
		76.5%	21.7%	1.8%	
	>2	52	26	6	
		61.9%	31.0%	7.1%	
<i>Marital status</i>	Single	23	2	9	0.103
		60.5%	16.7%	26.5%	
	Married	150	47	9	
		72.8%	22.8%	4.4%	
	Other	6	0	0	
		100.0%	0.0%	0.0%	
<i>Lack of funds for transport</i>	No	175	40	0	<0.001
		81.4%	18.6%	0.0%	
	Yes	4	62	9	
		11.4%	24.8%	3.6%	
<i>Fear of Contracting COVID-19</i>	No	174	48	0	<0.001
		78.4%	21.6%	0.0%	
	Yes	5	14	9	
		17.9%	50.0%	32.1%	
<i>Facility Restricting Number of Patients</i>	No	176	62	6	0.001
		72.1%	25.4%	2.5%	
	Yes	3	0	3	
		50.0%	0.0%	50.0%	

With over 75% of deaths occurring in high density areas in Lusaka due to COVID-19 infection, there has been a need to increase the number of health care workers, laboratory capacity and reagents as

DISCUSSION

well as utilisation of health facilities and commodities in order to contain the spread of the virus and reduce number of mortalities [17]. This has caused some of the other health care services to come to a screeching halt in order to accommodate this new development, for example, mass vaccination campaigns against measles were being cancelled in some countries for fear of contracting COVID-19 when visiting the health service providers [14].

### **Adherence level to child health services before the COVID-19 pandemic**

We captured data on the adherence levels of the care takers who took part in this study to the under-five clinical visits before the onset of COVID-19 by getting data from the clients under five cards. Results show that adherence levels to child health services before the COVID-19 pandemic were higher than adherence levels during the pandemic. This insinuates that the beginning of the pandemic has really put a toll on access to healthcare. This agrees with most studies which state that COVID-19 is a major Public Health threat globally [17] more so to Countries with an already weakened health care systems as is the case with Low-to-Middle-Income Countries (LMICs) such as Zambia [11]. Keeping in mind that access to healthcare services even before the onset of the pandemic proved to be a challenge especially for LMICs, the onset of the pandemic has really highlighted this issue as it has greatly put a burden on health care systems with access to health care being one of the areas mostly affected as medical facilities cannot be accessed in a timely manner [7].

About 75% of the under-five caretakers who took part in this study attended all under-five visits before the onset of the pandemic and 22.5% missed only less than 5 visits while the remaining 2.5% missed over 5 visits. This is consistent with the results from a recent study in Pakistan which stated that the average number of daily immunization and wellbeing visits are reported to have decreased by more than half since the start of the pandemic [3]. There is also growing evidence from England, Scotland and the United States that the COVID-19 pandemic response has caused vaccination rates to decline even within High Income Countries. This is according to McDonalds results on his study on early impact of the COVID-19 pandemic and physical distancing measures on routine childhood vaccinations [10]. However, it is also important to note that most of the clients actually attend under-five general health check-ups at various health posts nearer to their place of residence, according to the health workers at the health facility, so it is a possibility that in fact, there has not been a decline in the number of under-five health visits and so it should be more helpful for a door-to-door study to be taken in order to shed more light on this outcome.

### **Effect of COVID-19 on Access to Under-five Child Health Services at Chawama Level 1 Hospital**

The results of this study revealed that there was a reduction in the number of individuals attending all under-five clinic visits from 189 to 179, that is a 4% reduction. Consequently, there was also an increase in the number of mothers missing less than 5 under-five clinic visits from 55 to 62 (percentage increase of 2.8%) and an increase in



the frequency of mothers missing more than 5 under-five clinics from 6 to 9 (percentage increase of 1.2%). These results are similar to a study done by UNICEF [15] which observed that there was a reduction of health visits by mothers of under-five children in Afghanistan, Bolivia, Cameroon, Sudan and Libya among other Countries (<http://data.unicef.org/topic/child-survival/under-five-mortality/>)

This is a concerning observation as recent models show that lack of maintenance of routine childhood immunisation and under-five general health visits will lead to more deaths than possible COVID-19 associated deaths due to visits to vaccination clinics [14]. This will have a lasting negative effect on the Sustainable Development goals of the Zambian Nation specifically as all efforts to end preventable deaths of new-borns and children under 5 years as stipulated in SDG 3 [18] will be drowned and in general will lead to a reduced overall of healthy lives and well-being of children. However, it is a possibility that most care takers prefer taking their children to health posts nearer to their homes and only take their children to Chawama First Level Hospital because that is the only facility that houses most of the vaccines in that part of the province.

#### **Factors other than COVID-19 that may have led to the decreased number of Under-five Visits after the Pandemic**

We tried to marry other possible selected factors that may have caused a decrease in levels of access to under-five health care services and the results show that level of education, marital status and unavailability of healthcare workers were not

significantly associated to the reduced number of under-five healthcare visits. However, mothers having more than one child, shortage of medical supplies, fear of contracting COVID-19, lack of funds and restrictions of number of patients by the facility are significantly associated with reduced attendance of under-five visits. This is in line with Halwindi [6] and Saso's [14] studies which cited poor quality of health services, unavailability of medicines, financial constraints and weak outreach programmes as some of the factors which were perceived as barriers to access to healthcare.

This implies that there are factors that are associated with the reduction of under-five monthly visits other than COVID-19 and that they are most likely to reduce accessibility to health care services even prior to the onset of the pandemic. It is therefore important to mitigate the underlying factors in order to get a system that has better access to healthcare visits. Examples of such mitigations may include free healthcare for all health needs associated to under-five health care, reduced transport fare and increase in number of health posts to ensure equity of healthcare service distribution [9], adjustments on budgets and funds reserved for medical supplies upwards and increased sensitisation and administration activities for family planning in order to allow women to have enough resources such as time and money to cater well to their children's healthcare needs as well as their own. In addition, sensitisation exercises on the COVID-19 pandemic [20] to care takers seeking such services should be rendered and an increased holding capacity of the health facility should be implemented to avoid turning

back some people seeking healthcare services due to too many numbers.

## CONCLUSION

These results imply that the general wellbeing of children under five is compromised not just because even children are capable of contracting the coronavirus, but because their health is compromised as a result of missing crucial hospital visits. Hence, though not supporting the suspension of COVID-19 control measures, the immediate socioeconomic impacts of measures to stop transmission of the virus and end the pandemic may delay implementation of Sustainable Development Goals [17]. The later heavily relies on good access to healthcare especially by under-five children. This is a universal crisis and, for some children, the impact will be lifelong. Hence, as we focus to control it, we must not neglect the service necessary to sustain humanity beyond the pandemic.

## Recommendations

Following the revelation from this study, the following recommendations are given for the attention of the Ministry of Health;

1. The health systems in Zambia must be patched up and strengthened in order to successfully mitigate the impact of COVID-19 and ensure access to under-five health care services is not affected. This will involve an increase in skilled health workers, well-maintained facilities and infrastructural frameworks as well as adequate availability of personal

protective equipment (PPE) and medicines.

2. Mothers and care takers of under-five children must be well sensitised on the importance of attending all monthly under-five visits regardless of whether the child is due for an immunisation and also be sensitised on the Covid-19 pandemic so that rather than fearing healthcare posts, they are equipped with knowledge on how to access healthcare services and prevent themselves from contracting the virus.
3. Additionally, stringent infection prevention measures should be religiously followed by individuals who attend under-five health care services including the Health Care Workers.

## Limitations of the Study

It was noticed that most under-five care takers who participated in the study were scared rather shy to admit that they missed their visits due to fear of facing scrutiny by the health care workers at the facility. However, for most, information from the under-five cards showed otherwise, for those with kids not in their immunisation months. Also, for the care takers who did not necessarily understand as to why it was important to carry out this study were generally reluctant to take part in the study. Furthermore, most care takers did not seem to be comfortable with the fact that the researcher had to take a look at their under-five cards and this generally made data collection challenging.

## Suggestions of Further Studies

In order to truly appreciate the adherence levels of under-five healthcare visits in Chawama, a house-by-house research has to be conducted where under-five cards for all children under the age of five in every household are checked for level of adherence and to also collect information as to what the reasons for missing healthcare visits are. In addition, a summary of the children's general health and history of illness may be established in order to investigate if there is a correlation between missing under-five visits and general wellbeing and illness history for a child.

## REFERENCES

1. ACCA. (2020). *Key Health Challenges for Zambia*.
2. Buser. M., Cheryl. A., Moyer, Carol. J., Boyd. (2020). Cultural beliefs and health-seeking practices: Rural Zambians' views on maternal-new born care Julie
3. Chandir. S., Siddiqi. D. and Khan. A. (2020). Impact of COVID-19 lockdown on routine immunisation in Karachi, Pakistan.
4. Etyang. O. (2020). COVID-19 Pandemic and its Potential Impact on the Health Sector in the COMESA Region.
5. Gilbert. M. et.al. (2020). Preparedness and vulnerability of African countries against importations of COVID-19: a modelling study
6. Halwindi. H., Siziya. S., Magnussen. P., and Olsen. A. (2013). Factors Perceived by Caretakers as Barriers to Health Care for Under-Five Children in Mazabuka District, Zambia
7. Hamid. H. and Abid. Z. (2020). Current Burden on Healthcare Systems in Low- and Middle-Income Countries.
8. Lone. A. and Ahmad. A. (2020). COVID-19 pandemic – an African perspective, *Emerging Microbes & Infections*, 9:1, 1300-1308, DOI: 10.1080/22221751.2020.1775132
9. Lungu. A., Biesma. R., Chirwa. M. and Darker. C. (2016). Healthcare seeking practices and barriers to accessing under-five child health services in urban slums in Malawi: a qualitative study.
10. McDonald. H. I. et al. (2020) Early impact of the coronavirus disease (COVID-19) pandemic and physical distancing measures on routine childhood vaccinations.
11. Okereke. M. (2020). Impact of COVID-19 on access to healthcare in low- and middle-income countries: Current evidence and future recommendations
12. Paulo das Neves Pires, Cynthia Macaringue, Ahmed Abdirazak, Jaibo Mucufu, Martins Mupueleque, Ronald Siemens, Celso Belo (2020)
13. Peng. E., Sey. R., De Beritto. T., Lee. H., and Powell. C. (2020). Advancing Health Equity by Translating Lessons Learned from NICU Family Visitations during the COVID-19 Pandemic.
14. Saso. A., Skirrow. H. and Kampmann. B. (2020). Impact of COVID-19 on Immunization Services for Maternal and Infant Vaccines: Results of a Survey Conducted by Imprint—The Immunising Pregnant Women and Infants Network
15. UNICEF. (2020). (<http://data.unicef.org/topic/child-survival/under-five-mortality/>)
16. UNICEF headquarters by Lucia Hug, David Sharrow and Danzhen You. (2019). Levels & Trends in Child Mortality Estimates developed by the UN Inter-Agency Group for Child Mortality Estimation
17. UN. (2020). Policy Brief: *The Impact of COVID-19 on children*
18. WHO. (2016). Health in the Sustainable Development Goals.
19. WHO (2020) Pulse survey <https://www.euro.who.int/en/health-topics/Life-stages/child-and-adolescent-health/covid-19-and-children>
20. WHO. (2020). World Economic Outlook Update. *Int Monet Fund*. 2020
21. ZNPHI, (2020). *COVID-19 and Additional Preventive and Control Measures Introduced by the Government of Zambia*. Available at: <http://znphi.co.zm/news/> (Accessed: 28 September 2020)