The Impact of Epidemics (Covid-19 & Cholera) on Sexual Reproductive Health and HIV Commodities and services for Adolescents and Young People - Zambia.

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Acronyms

AIDS - Acquired Immune Deficiency Syndrome

AYP - Adolescents and Young People

CHAI - Clinton Health Access Initiative

CHAZ - Churches Health Association of Zambia

COVID-19 - Coronavirus disease

FGDs - Focus Group Discussions

HIV - Human Immunodeficiency virus

LARC - Long Acting Reversible Contraceptives

NCDs - Non-communicable Diseases

PEP - Post Exposure Prophylaxis

PrEP - Pre-Exposure Prophylaxis

SDGs - Sustainable Development Goals

SRH - Sexual Reproductive Health

USAID - United States Agency for International Development

UNFPA - United Nations Fund for Population Activities

WHO - World Health Organisation

ZAMMSA - Zambia Medicines and Medical Supplies Agency

ZNPHI - Zambia National Public Health Institute

Glossary of terms

Coronavirus disease (**COVID-19**) is an infectious disease caused by the SARS-CoV-2 virus.

Pandemic is when a new disease or a new strain of an existing disease spreads to multiple regions across the globe

Epidemic – rapid spread of a disease to a large number of hosts in a particular population within a short period of time.

Cholera is an acute diarrhoeal infection caused by ingestion of food or water contaminated with the bacterium Vibrio cholerae.

A **disease outbreak** is the occurrence of cases of disease in excess of what would normally be expected in a defined community, geographical area or season.

Executive Summary

This study investigates the impact of the COVID-19 pandemic and the 2023-2024 cholera outbreak on the accessibility of sexual reproductive health and HIV services for adolescents and young people (AYP) in selected districts of Zambia.

The study was a desk review mixed with qualitative data collection using focus group discussions and key informant interviews. The research reveals significant disruptions to SRH/HIV service delivery and access to essential commodities.

COVID-19 lockdowns and movement restrictions severely hampered access to healthcare facilities, despite relatively stable national-level stock of many SRH/HIV commodities. However, last-mile distribution was significantly delayed, resulting in commodity shortages in some facilities. Fear of COVID-19 infection, misinformation about healthcare facilities being COVID-19 hotspots, parental restrictions, and financial constraints further restricted access for AYP. Additionally, expired commodities and a shift to temporary distributors who lacked familiarity and rapport with AYP created additional barriers.

The subsequent cholera outbreak exacerbated these challenges, particularly in Lusaka where many health facilities were repurposed for cholera treatment, leading to reduced access to SRH /HIV services. Conversely, in Kitwe, preexisting access issues were compounded by the outbreak. Despite these significant disruptions, AYP demonstrated remarkable resilience, employing diverse coping mechanisms to access essential commodities, highlighting the critical need for flexible and accessible service delivery models.

This study emphasizes the urgent need for interventions to enhance the resilience of SRH commodity supply chains and healthcare delivery systems in Zambia. Key recommendations include strengthening community-based distribution networks, implementing flexible delivery strategies (mobile clinics, online ordering, etc.), designating SRH/HIV services as essential during emergencies, and employing targeted

interventions to overcome existing inequalities and address the unique challenges faced by vulnerable AYP. The findings underscore the critical importance of proactive and adaptable strategies to ensure uninterrupted access to essential SRH/HIV services for AYP in Zambia, even during major public health crises.

1.0 Introduction

Throughout history, epidemics and pandemics have had a substantial impact on many elements of human life. The Human Immunodeficiency virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) have recently dominated health-care resources and efforts in the African continent, affecting several aspects of social, health, and economic development (WHO 2021). The Coronavirus (Covid-19) epidemic has had a further severe impact on these sectors, which are the foundation for reaching the Sustainable Development Goals (SDGs). As part of the global reaction to these epidemics, numerous commodities have been implemented to help with illness prevention, care, and treatment (Babatunde, Oloruntoba and Agho 2020).

An important area of concern is the dual effects of epidemics like Covid-19 and cholera on HIV commodities and resources for sexual and reproductive health (SRH) among adolescents and young adults in Zambia (Munakampe et al., 2024). Global healthcare systems have been rocked by the Covid-19 pandemic, which has exacerbated pre-existing vulnerabilities and restricted access to vital medical care, especially for vulnerable groups like adolescents. The convergence of these health crises offers considerable problems to SRH care delivery in Zambia, where the prevalence of HIV among young people aged 15-24 is around 3.8%, with much higher rates among young women (5.6% compared to 1.8% for young men) (Munakampe et al., 2024).

Cholera outbreaks equally disrupts health services since they frequently result in the reallocation of healthcare resources to immediate public health measures, putting existing SRH projects on hold.

A study done by Stephenson et al., (2021), reviewed that during a health emergency, the availability of HIV preventive methods such as condoms and pre-exposure prophylaxis (PrEP) is severely limited. This scenario is especially serious for adolescents and young people, who are already vulnerable due to socioeconomic circumstances and poor access to sexual health education (Stephenson et al., 2021).

The stigma surrounding HIV/AIDS continues to hinder young people's willingness to seek necessary care and information, which is further aggravated by the fear of contracting Covid-19 in healthcare settings (Van and Mayman 2022).

As Zambia navigates these intertwined public health challenges, understanding the impact on SRH resources and HIV commodities is essential for developing effective interventions aimed at safeguarding the health and well-being of its youth population. This research aims to provide a comprehensive analysis of these dynamics, highlighting the urgent need for targeted strategies that address both immediate and long-term health needs of adolescents and young people in Zambia amidst ongoing epidemics.

1.1. Background

Covid-19 is a viral respiratory disease caused by the 2019 novel coronavirus (SARS-CoV-2). On December 8, 2019, the first case of coronavirus disease 2019 (Covid-19) was reported in Wuhan, China (Chen and Yu 2020). Chinese health authorities notified the World Health Organization (WHO) on December 31, 2019, and by January 30, 2020, WHO designated the outbreak as a Public Health Emergency of International Concern (Durrheim, Gostin and Moodley 2020).

As the number of people affected by this virus continued to increase rapidly across the globe, many counties considered and implemented a number of unprecedented responses targeted at reducing the transmission and spread of the virus (Velavan and Meyer 2020; Svoboda 2021). These responses included quarantine measures, social distancing, travel restrictions, shutting down of different activities, and then, an ultimate lockdown (Svoboda 2021). These measures and decisions including the lockdowns disrupted economic activities in virtually every part of the world with strong impacts on the overall supply chains including health systems supply chains (Araujo 2023). Consequently, there were disruptions in the flow of raw materials and semi-finished goods with severe effects on most organizations across the globe resulting in delays in the production of goods and increased costs of products and services (Meier and Pinto 2020).

Since the onset of the Covid-19 pandemic, direct and indirect effects of Covid-19 on health systems have been documented globally.

In sub-Saharan African countries, like in other parts of the world, the resources and services for public health had been pushed to their limits by the impact of Covid-19. Even before the pandemic, there was a long-standing lack of essential supplies for SRH and HIV interventions, as well as problems with procurement, supply chain, and distribution systems (Gashaw, Hagos and Sisay 2021). International public buyers and the U.S. Agency for International Development (USAID) have encountered difficulties in obtaining key supplies for adolescents and young people, especially those in youth-friendly formats specific to this age group (Gashaw, Hagos and Sisay 2021; Azmat et al., 2021). These issues were posing a threat to national HIV control programs and global efforts to combat the AIDS epidemic. With the onset of the Covid-19 pandemic, this already difficult situation had been exacerbated by several factors (Gashaw, Hagos and Sisay 2021; Azmat et al., 2021; Ooms et al., 2020).

The lockdowns due to Covid-19 in many African countries led to disruptions in HIV services and distribution, causing bottlenecks that have impacted the health system and access to HIV services (Mhango, Chitungo and Dzinamarira 2020). The situation mirrors the challenges faced by other health services. During this period, countries followed WHO guidelines to improve and streamline condom and contraception usage (Mhango, Chitungo and Dzinamarira 2020; Chandra-Mouli and Akwara 2020). However, funding and accessibility for young people were inadequate and, in some cases, dependent on purchasing agents. This resulted in shortages in medical supplies (Mhango, Chitungo and Dzinamarira 2020; Chandra-Mouli and Akwara 2020; Lindberg, Bell and Kantor 2020).

Cholera is an acute diarrheal infection caused by the ingestion of food or water contaminated with the bacterium *Vibrio cholerae*. In regions affected by recurrent cholera outbreaks, including several countries in sub-Saharan Africa, the burden of the epidemic extends beyond immediate morbidity and mortality (Mashe et al., 2023; Baltazar et al., 2022; Chowdhury et al., 2022).

Cholera epidemics not only strain health care systems but also disrupt essential health services, including those related to SRH and HIV treatment (Chowdhury et al., 2022). Globally, researchers have estimated 1.3 to 4.0 million cases of cholera each year and 21,000 to 143,000 deaths worldwide due to cholera (Chowdhury et al., 2022). The

causative agent, *Vibrio cholerae*, has been eradicated from cholera transmission in high-income nations through better sanitation facilities and access to clean water. However, cholera epidemics have continued to affect millions of people in several developing countries - Asia, Africa, and Latin America, where access to clean water and improved sanitation facilities are not widely available (Chowdhury et al., 2022).

In sub-Saharan Africa, cholera epidemics have continued to occur in Tanzania, Zimbabwe, Ethiopia, Malawi, Mozambique, the Democratic Republic of the Congo and Zambia (Olu et al., 2021). These continued recurrence of cholera outbreaks in the region calls for heightened surveillance, enhanced preparedness, and sustainable preventive, response, and control measures in communities and border areas, to prevent and mitigate cross-border transmission (Olu et al., 2021; Lawal et al., 2024; Zheng et al., 2022; Debes et al., 2021).

Zambia, one of the six nations in the World Health Organisation (WHO) African Region, experienced a cholera outbreak which was classified an acute crisis (Kateule 2024; Mbewe et al., 2024).

Zambia has experienced several cholera outbreaks since 1978; with the worst epidemics recording over 12,500 cases in 1991, 1999, and 2023-2024 (Kateule 2024). The 2023-2024 Cholera outbreak was declared on 18th October 2023 by the Zambia Ministry of Health. The index case was a resident of Kanyama compound in Lusaka district. As of 12th February 2024, the disease had spread countrywide with a total of 18,519 cases, including 625 reported deaths. More than 78 of the 116 districts had been affected by the 2023-2024 cholera epidemic. Of a total 78 districts that had reported cholera, 64 districts had reported imported cases from Lusaka between January and February 2024. Compared to the 30 previous outbreaks, this may have been the biggest cholera outbreaks in the country's history as evidenced by the escalation in the number of cases and the epidemic's potential to spread into other districts (Kateule 2024).

1.2. Scope and Objectives

This report will explore the impact of epidemics on the availability of SRH and HIV-related services for adolescents and young people in Zambia. This research is critical given that these populations are particularly vulnerable to both health crises and the long-term consequences of inadequate access to health services. It will also strive to raise awareness among stakeholders in Zambia about the critical need for sexual reproductive health/HIV commodities and services for adolescents and young people in light of recent epidemics such as Covid-19 and Cholera. It will provide recommendations for improving SRH/HIV commodity security and service delivery, based on an examination of the evidence leading up to the outbreak and the unmet needs during the crisis. It suggests potential implications for commodities and determinants related to the epidemics, as well as feasible, effective, efficient, and sustainable solutions. Additionally, the recommendations stress the importance of evidence-based and evaluative research, and evaluating individual supply chains where comparable data is available.

2.0. Literature review

Sub-Saharan Africa (SSA) where Zambia is situated faces a double burden of diseases. While working to control infections such as tuberculosis and malaria, there has been a growing burden of non-communicable diseases such as hypertension, cardiovascular diseases and diabetes (NCDs).

The impact of these epidemics on sexual reproductive health and HIV commodities for adolescents and young people in the region is concerning (Kolawole et al., 2023; Coates et al., 2020; Achwoka et al., 2020).

2.1. Overview of selected epidemics

Some of the recent epidemics that have been recorded globally in the recent past are: Severe Acute Respiratory Syndrome, Ebola, Influenza, Middle East Respiratory Syndrome, Swine Flu, and Covid-19 (Song et al., 2019; De Wit et al., 2016). The Ebola virus disease outbreak that occurred in 2013-2015 mainly affected African countries such as Liberia, Guinea, Sierra Leone, and Côte d'Ivoire had a death toll of about 11,325 deaths with more than 10,000 confirmed cases (Cenciarelli et al., 2015).

2.2. Impact of COVID-19 and Cholera

The Corona or Covid-19 pandemic had infected more than 4 million people globally by May 2020 resulting in over 300,000 deaths. Although Africa had been negatively impacted by Covid-19, the spread of the diseases and the death rate was much slower than in Asia, Europe, Latin America and North America (Kaba and Kaba 2020).

The Covid-19 pandemic has had significant impact on the provision of SRHR and HIV services in various ways. The operating hours in most health facilities had been reduced and the availability of supplies limited (Riley et al., 2020; Silhol et al., 2021; Jewel et al., 2020). This resulted in disruptions in the distribution of condoms, family planning commodities and other essential HIV prevention commodities such as pre-exposure prophylaxis (PrEP) medications and HIV test kits. These disruptions exacerbated existing barriers to the provision of SRHR services (Riley et al., 2020; Silhol et al., 2021; Jewel et al., 2020). The long standing challenge of inadequate resources and infrastructure in most African countries such as Zambia further hindered access to necessary services. Additionally, the closure of health facilities and limited mobility worsened the situation. The increase in demand of commodities and reduced production during the pandemic also led to a rise in producer prices for health commodities (Riley et al., 2020; Silhol et al., 2021; Jewel et al., 2020).

It is estimated that there are 1.3 to 4.0 million cases of cholera each year, and about 21 000 to 143 000 deaths worldwide due to cholera (Chowdhury et al., 2022). In Africa alone, 40 to 80 million people live in Cholera hotspots. Climate change, urbanization, and population growth will likely increase the risk of cholera in the coming years (Ebob 2020; Moyo et al., 2023). In 2010, about 60 % of populations living in the urban areas in sub-Saharan cities lived in slums. This increased the demand for infrastructure and in turn worsened access to safe water and basic sanitation for the most vulnerable populations (Zerbo, Delgado and González 2020; Alaazi and Aganah 2020). As a result, a global strategy to control cholera was established in 2017 to reduce mortality due to cholera by more than 90% (Legros 2018).

2.3. Adolescents and Young People

More than 250 million adolescents aged 10-19 by 2020 were domiciled in SSA, making up 20 percent of the global adolescent population, and this number is expected to increase to more than 24 percent by 2030 (Melesse et al., 2020). Although adolescents and young people have the right to enjoy many rights, including the right to access accurate information, education, and access to health services such as sexual reproductive health and HIV, they face a number of barriers that hinder their development (Sidamo et al., 2023; Ninsiima, Chiumia and Ndejjo 2021).

2.4. Sexual Reproductive Health Commodities

Commodities are essential materials or service products that contribute to improving health outcomes across different levels of care. They are grouped into various categories to address specific health concerns, including health promotion, prevention, treatment, and diagnostics, all aimed at serving the global health agenda. These commodities must be affordable, constantly available, of assured quality, and distributed promptly in the right quantities and locations to meet healthcare demands.

In Sub-Saharan Africa, a critical focus is on Sexual and Reproductive Health (SRH) and HIV commodities for adolescents and young people.

The COVID-19 pandemic severely impacted access to these essential SRH and HIV commodities, especially for adolescents. With the closure of formal school-based services and reproductive health facilities, access to commodities such as short- and long-term contraceptives, emergency contraceptives, safe abortion commodities, and sexually transmitted infection (STI) treatment supplies drastically declined (Akmal, Hares and O'Donnell 2020). As a result, many of the region's 250 million young people were left without adequate information and access to vital SRH services, leading to increased infection rates, unintended pregnancies, and unsafe abortions (Akmal, Hares and O'Donnell 2020; Meherali et al., 2021).

Although short-term contraceptives, such as oral contraceptive pills, contraceptive patches, and injectable methods, offer temporary protection and require regular use or administration to be effective and therefore not so preferred by adolescents seeking long

term solutions, they would still be useful in an epidemic when choices are limited (Meherali et al., 2021). Long acting contraceptives, like intrauterine devices (IUDs) and implants, provide extended protection against pregnancy and require minimal maintenance, making them suitable for long-term solutions seekers (Trussell, Raymond and Cleland 2019). Emergency contraceptives, often referred to as "morning-after pills," are critical in preventing unintended pregnancies following unprotected intercourse or contraceptive failure (Trussell, Raymond and Cleland 2019). To avert unwanted pregnancies which are common among adolescents, emergency contraceptives should be made available.

A study done in South Africa and Zambia on contraceptive use reviewed difficulties by women in accessing their preferred contraceptive methods during the Covid-19 pandemic (Callahan et al., 2024). It also reviewed that women were unable to delay or avoid pregnancy as a result of unavailability of the contraceptive methods they preferred or for fear of contracting Covid-19 while obtaining the service. This may have contributed to an increase in unplanned pregnancies and therefore unsafe abortions during the lockdown (Callahan et al., 2024).

The study reported stock outs of family planning commodities such as implants and injectables, pills and long acting reversible contraceptives (LARC). LARC have become one of the most preferred contraceptive method in developing countries. However, their use was reduced during Covid-19 because of lockdowns and fear of contracting the disease since they require skilled personnel to initiate usage (Callahan et al., 2024). Fortunately, the review showed that clients were offered alternative contraception in cases of stock outs. This study conformed to findings of another study done in low and middle income countries (LMIC) which also reviewed that use of provider dependent contraceptives such as LARC declined during the Covid 19 pandemic (Karp et al., 2024). By contrast, Karp's study in seven Low and Middle Income (LMIC), reported that most health facilities (private and public) had no disruption in contraceptive supplies (Karp et al., 2024). This might have been because in the countries under study, which included SSA countries, severe Covid-19 restrictions were not common and fundamental policy changes regarding SRH were enacted early (Plotkin et al., 2022). In addition, it was reported that private facilities had more contraceptive supplies disruptions as compared to public facilities and hence the latter were more resilient to epidemic shocks (Plotkin et al., 2022).

An online survey conducted in the UK on the access and use of contraceptives and condoms among young people in the initial stage of Covid-19, revealed disruptions in services provision which had the potential to result in increased STIs and unwanted pregnancies and ultimately unsafe abortions (Lewis et al., 2021).

Safe abortion commodities are equally important in ensuring comprehensive SRH care. These include medications such as mifepristone and misoprostol and surgical abortion equipment (WHO 2020). The lack of access to safe abortion services during the pandemic contributed to an increase in unsafe abortion practices, particularly among adolescents who face barriers in accessing healthcare. Strengthening supply chains for safe abortion drugs and related medical technologies is crucial to ensuring that young people have access to comprehensive SRH services (Riley et al., 2020).

Strengthening commodity supply chains for drugs, medical technologies, and infrastructure is essential to overcoming these challenges and addressing the SRH needs of adolescents and young people in Sub-Saharan Africa (Kotlar et al., 2021). This includes ensuring the availability of contraceptives, STI commodities, and safe abortion products, as well as improving distribution networks to maintain access in times of crisis (Riley et al., 2020; Kotlar et al., 2021).

2.5. Availability and Accessibility of SRH Commodities

Another direct effect of epidemics is the economic impact. This impact is also reported to have affected HIV and SRH health commodities. There are reports of disruptions in the provision of antiretroviral drugs and family planning commodities because of transportation, financial, and other disruptions along the supply chain (Tetteh 2021; Ng'andu et al., 2022). The negative impact of Covid-19 on the availability of sexual and reproductive health information and services for adolescents and young people is well documented (Tetteh 2021; Ng'andu et al., 2022).

Another factor which determines accessibility of SRH/HIV commodities and services is confidentiality and the relationship with healthcare providers. If adolescents do not feel they will get these things, they may not seek treatment at all (Decker et al., 2021; Eigenhuis

et al., 2021). It is therefore imperative to use trusted healthcare professionals or indeed community health distributors during epidemics to ensure continued accessibility of SRH/HIV commodities. Many young people shun congregate settings and lines as they are associated with stigma that can be amplified by emerging infectious diseases or poor or weak health information communication (Muhia 2023). This underscores the important role that community health distributors play.

2.6. HIV Commodities

In order to reach HIV epidemic control, a vast proportion of adolescents and young people living with HIV should get to know their status, be initiated and adhere to antiretroviral treatment (ART). Through testing, all people living with HIV is one of the ways that were put in place to ensure that everyone knows their status. This will help lower the HIV viral load in the bodies of people living with HIV and save them from death (González-Alcaide 2020; Mambo et al., 2022). This process is usually disrupted during epidemics because of the shift in resources and the perception that it may not be essential or urgent.

Additionally, the universal test and treat strategy allows everyone who tests HIV-positive to initiate antiretroviral treatment regardless of the stage of HIV (González-Alcaide 2020). This helps suppress the viral load, hence avoiding the development of advanced HIV disease and death of many people living with HIV. Despite the strategy being in place, many adolescents and young people were unable to secure the drugs during Covid-19 and areas which were affected by cholera in Zambia (González-Alcaide 2020). This is concerning as it might reserve the gains made towards reaching epidemic control.

The provision of HIV diagnostic and treatment services involves a multifaceted approach, requiring a combination of specialized medical tests and various medications. Standard diagnostic tools include viral load and CD4 tests, which are essential for monitoring disease progression and the effectiveness of treatment (Pham et al., 2022; Zaniewski et al., 2020; Kabir et al., 2020). This process should not be disrupted at any time not even during an epidemic as it may result in the development of HIV resistant strains. For adolescents who test HIV positive, treatment often involves taking a combination of antiretroviral drugs. These combinations typically contain three potent medications designed to suppress the virus effectively, thereby improving overall health and quality of life (Wilkins et al., 2024).

Disruption of HIV commodities during an epidemic may result in drug shortages which may have grave consequences.

Measures aimed at combating the spread of Covid-19 such as lock downs and social distancing resulted in scaling down of production of ARVs since manufacturing industries were not operating at full capacity in order to comply with social distancing measures (Bharat 2020). Additionally, disruptions in transportation and border clearance delays resulted in reduced stocks of ARVs (Bharat 2020). Multi month scripting which was implemented as a stopgap measure to reduce client contact with the facilities further strained ART stocks. Reduced production resulted in delays of up to 2 months and had cost implications.

A study done by Mude et al., (2023), reviewed a reduction in HIV testing during the pandemic. HIV testing has been crucial in making sure people, including adolescents know their status so they could be initiated on ART and it is crucial for index case identification, early initiation on ART and HIV prevention in order to reach epidemic control (Mude et al., 2023). However, the reduction in HIV testing and viral load was not as a result of testing and viral load commodities stock outs but as a result of disruptions in ART service provision where certain programs such as outreach activities were suspended to reduce Covid-19 transmission. On the contrary, a study by Carpenter (2024) showed in increase in VL testing among adolescents as compared to children and adults, perhaps because adolescents were not afraid to visit health facilities because they were not as vulnerable to Covid19 as the elderly and children (Carpenter 2024). Additionally, they might have had access to HIV programs through differentiated services delivery (DSD) models that equipped them with knowledge on how to take charge of their health through social media unlike the adults (Carpenter 2024).
Studies on Covid-19 reviewed that supply chain disruptions may have affected access to ART, PrEP, viral load monitoring, STI screening and condom availability among key populations some of whom were adolescents (Jewell, Smith and Hallett (2020).

Condoms remain a crucial component of HIV prevention, offering a barrier method to reduce the transmission of the virus. The continuous supply and accessibility of these HIV-

related commodities ART, PrEP, PEP, testing kits, and condoms are critical in controlling the epidemic. However, challenges in distribution and stock management often arise, particularly in resource-limited settings, exacerbating the global efforts to combat the disease (WHO 2010).

2.7. Challenges in Procurement and Distribution

Countries may take action to avert possible commodity shortages when the demand rises such as rationing. However, these steps can impact commodity availability and result in dire consequences (Chattu and Yaya 2020).

The persisting myth that contraceptives are tainted with HIV is a major obstacle to getting and distributing these vital reproductive healthcare supplies in various sub-Saharan African nations including Zambia (Nyundo 2020). This false belief has encouraged a general hesitancy to get and provide contraceptives, ignoring the unique requirements and inclinations of those who rely on them. Consequently, it impedes the effective distribution of resources via vital financial systems, impeding the satisfaction of reproductive health requirements (Nyundo 2020).

2.8. The Intersection between Epidemics and SRH/HIV Commodities

In some cases, the impact of the COVID-19 pandemic on the SRH/HIV commodities supply chain prompted consideration of some critical programming gaps involved with responding to such pandemics. It has been recommended to consider the vulnerability of limited access to SRH/HIV supplies and services in emergency scenarios by recognizing and addressing the intersecting barriers. For example, in terms of gender, women and girls continue to bear the majority of unpaid caregiving responsibilities, have less secure, low-paying informal jobs, and are frequently involved in informal commerce, putting them in refugee settlements with limited access to essential services, including SRH/HIV supplies, and lacking targeted support. Such inequalities, put the victims in harm's way and makes them more vulnerable during epidemics.

HIV/AIDS positive individuals may make it more difficult for them to obtain essential SRH/HIV supplies and services and Covid-19 associated items, which could cause them to

lose their place in priority groups. Age-appropriate SRH information and services are frequently unavailable to young people, and disabled persons have more difficulty obtaining both mainstream and supportive services (Poku 2021; Fleischman et al., 2022; Ngoma-Hazemba et al., 2024; Zulu et al., 2024; Mwoka et al., 2021). These vulnerable groups should be borne in mind during policy formulations in order not to leave them out.

The convergence of different factors influencing the availability, accessibility, and continued barriers to SRH/HIV supplies and services is complex and not often obvious. As long-term pandemics like COVID-19 occur, their impact on our daily lives will exacerbate these issues, emphasizing the importance of addressing them in order to maintain inclusion for all. Neglecting these issues could lead to societal instability.

2.9. Strategies and Interventions to ensure availability of SRH/HIV commodities and services

Innovative and effective interventions are needed to ensure prudent use of resources during and after epidemics (Hasan 2021).

Primarily, four types of interventions that could foster the development, adoption and implementation of robust and resilient health services delivery even in the face of epidemics were identified from the literature. These included strengthening the role of community health workers and community social networks, adopting and implementing digital health (Fagherazzi et al., 2020; Sust et al., 2020) and expanding pharmacy-based delivery services (Taylor, Cairns and Glass 2021; WHO 2020; Perry et al., 2021).

These interventions have been shown to be effective in addressing the challenges that arise during epidemics, ensuring that the supply chains of essential commodities such as SRH/HIV commodities remain resilient to market fluctuations and supply shocks. However, many challenges still persist in achieving this goal. Implementation research would be useful in this regard to dissect and evaluate barriers to achieving this goal and suggest possible solutions.

Community health workers (CHW) have routinely been utilized to distribute SRH commodities such as condoms with good outcomes. They could be utilized during epidemics to ensure SRH consistent commodity supply to adolescents and young people.

Similarly, they could also be used to distribute HIVST kits in a manner similar to home-based condom distribution. A study to investigate the willingness of the community to receive HIVST kits through CHW, revealed that it was socially acceptable and could increase access to routine HIV testing particularly during epidemics such as Covid-19 (Sodhi, Tang and Willenson 2023).

It is important to implement strategies that are easily adopted and accepted by end users to assure continuous demand for these commodities to support their availability even in times of crisis (Sodhi, Tang and Willenson 2023).

Public-private partnerships (PPP) can improve collaboration and result in efficient use of resources of both sectors. Such partnerships can lead to improved efficiency and resilience of the supply chain for SRH/HIV commodities (Lyons 2021; Lindberg, Bell and Kantor 2020).

Implementing robust strategies, we can create a more resilient and responsive system that can effectively address the challenges posed by epidemics. Furthermore, investing in research and development to discover new and improved interventions is vital. By staying at the forefront of innovation and scientific advancements, we can anticipate future challenges and proactively develop strategies to mitigate their impact.

3.0. Methodology

3.1. Approach

Our methodological approach was participatory in nature in order to learn from the wide range of participants, including project beneficiaries, strategic and implementing partners. A qualitative design which was rigorous and laced with triangulation of information to enhance its validity was used.

The target population for the study comprised AYP in Chilanga, Lusaka, Kitwe and Kalulushi, the four districts where CRZ has been implementing the YOUTH CARE project and MoH officials, volunteers and distributors. Purposive sampling was used to select participants for the FGDs. This was necessary because the study required unique knowledge on SRH and HIV-related services and commodities available to AYP in Zambia

during epidemics (Lopez and Whitehead 2013). For the in-depth interviews, convenience sampling was adopted as participants were invited for the study based on availability and willingness to participate in the study.

3.2. Data Gathering Instruments and Techniques

This assignment was a desk review of the Impact of epidemics such as Covid-19 and Cholera on the availability of SRH/HIV commodities and services for AYP. However, to strengthen and validate the findings of the desk review, a qualitative methodology was incorporated in the methodology.

3.2.1. Document Analysis or Desk Review

A comprehensive document analysis of the existing and available literature was undertaken. The review sought to establish and understand the effects of epidemics on SRH/HIV commodity supply chains and service provision, and how they can be addressed. It also specifically investigated the effects of epidemics on the availability of SRH/HIV commodities and services that have been experienced in Zambia. The following documents were reviewed:

- Existing policies and programmes in relation to SRH/HIV service delivery including logistics management.
- SRH/HIV guidelines.
- Existing literature on SRH/HIV service delivery before, during and after epidemics (Covid-19 and Cholera).

3.2.2. Qualitative Interviews

These were face-to-face interviews and Focus Group Discussions. These methods employed are detailed below:

a) In-depth Interviews:

In-depth interviews are a form of qualitative research that involve verbal conversations between an interviewer and a participant. During these interviews, the interviewer asks a series of questions to elicit information from the participant. The interviews are semi-structured, which means they allow for a conversational flow that enables participants to explore and discuss issues they find significant. In-depth interviews are useful for examining complex behaviors, opinions, and emotions, as well as gathering diverse experiential information. They are a flexible and insightful tool for qualitative inquiry, providing a deep understanding of participants' perspectives.

b) Focus Group Discussions:

Focus group discussions, also known as FGDs, are a widely used qualitative research method across various disciplines, including health and social sciences, to gain in-depth understanding of participants' perceptions, attitudes, and behaviors (Lakshman 2000). FGDs are a valuable tool for gathering rich data and encouraging participant engagement. However, researchers must adopt a critical and reflexive approach to address the practical and ethical challenges that arise in FGDs, ensuring that the method is adapted to the cultural and contextual nuances of the study population (Dawson, Daniels and Clapham 2014). The adaptability of FGDs in various research contexts highlights their potential to contribute to policy-relevant outcomes and community empowerment (Fitzsimmons 2017).

4.0. Findings

4.1. Description of respondents

We interviewed key informants drawn from the Ministry of Health (n= 10 respondents at national and district level)), Zambia National Public Health Institute (n=1), Zambia Medicines and Medical Supplies Agency (n=1), FGDs with Adolescents (n=24 from

Lusaka and Kitwe) as well as Volunteers and distributors (n=6), 3 from Lusaka and 3 from Kitwe.

4.2. Key Informant Interviews:

4.2.1. National level

Stock levels for sexual reproductive health commodities such as contraceptives, condoms and drugs for performing safe abortions as well as HIV commodities did not fluctuate much before and during Covid -19 and Cholera. However, there was were delays in the delivery of these commodities because the focus had shifted to controlling Covid -19.

"Stock levels were closely monitored such that provinces and districts that run out were quickly supplied through a method we call redistribution. We collected from overstocked facilities and supplied the ones that had run out", said one respondent at national level. *We did notice a slight increase in the lead time when procuring these commodities because some manufacturing companies had closed or were not operating at full capacity in compliance with Covid-19 guidelines for the control of the pandemic. However, no such disruption was noticed during cholera as the epidemic was localized. Countries where we procure these commodities were not affected."*

To ensure continued availability of SRH and HIV commodities, the supply chain is closely monitored and performance assessments conducted by Ministry of health in collaboration with stakeholders. This results in timely procurement or redistribution of commodities where they are needed most.

"We train staff handling logistics regularly and ensure adherence to supply chain guidelines with support from stakeholders such as UNFPA, CHAZ, Marie Stopes and CHAI. This is done consistently whether we have an epidemic or not."

Zambia National Public Health Institute (ZNPHI)

Although, ZNPHI is mandated to spearhead the management and control of all epidemics such as Covid-19 and Cholera in Zambia, it had no role in the procurement and delivery of

SRH/HIV commodities. In terms of logistics, their focus was purely on the availability of Covid-19 and Cholera related commodities.

Zambia Medicines and Medical Supplies Agency (ZAMMSA)

During the Covid-19 pandemic, there were delays in delivering SRH commodities to the last mile because priority was placed on delivering commodities such as face masks, Covid-19 rapid test kits and aprons which were urgently needed to control and manage the pandemic.

"Emergency orders for Covid-19 commodities were prioritized and therefore promptly honoured before attending to routine orders. During Covid-19, we noticed a reduction in routine orders for SRH commodities perhaps because they were not considered a priority by facilities. Since we operate a pull system where we only deliver upon receiving orders from the lower levels, we could only remind them about the commodities in stock".

ZAMMSA had delays in receiving orders from the global market due to lockdowns and closure of some manufacturing companies during the COVID-19 pandemic. This automatically increased the waiting time for SRH and some HIV services and commodities such as HIVST kits. This coupled with inadequate transport to distribute to the last mile compounded the problem. However, the agency partnered with stakeholders to cushion transport challenges.

"Delays in receiving orders were observed due to lockdowns and competing for the same emergency resources with other countries. SRH and HIV commodities at national level were not depleted because like I mentioned, some facilities at lower levels were not placing orders. This was more common during Covid-19 than Cholera."

To ensure continued availability of SRH/HIV commodities and service provision at lower levels, the agency monitors the stock levels of these commodities at lower levels and stocks up their hub centres dotted around the country and issues a list of available commodities to facilities. They also offer trainings and technical supportive supervisions to the lower levels.

"Every 2 weeks we share a list of available commodities which include SRH/HIV commodities. We also monitor stock levels through our automated system and remind facilities to redistribute and consume overstocked commodities and those with a short expiry."

ZAMMSA works closely with stakeholders such as USAID, UNFPA, and Global Health Supply Chain (GHSC) to achieve its objectives.

4.2.2. Sub-national level

In all the four (4) districts that were visited, all HIV commodities were available apart from HIVST which ran out in Lusaka.

One adolescent focal point person said, *"HIVST kits were on demand during Covid-19 because adolescents avoided going to facilities for fear of getting infected. This was not experienced during cholera since we did not have travel restrictions as compared to Covid-19."*

All the districts reported that most of the SRH commodities were available but because of the lock down and the fear of being infected with Covid-19, adolescents were not accessing them. Lusaka district is the only district that reported running out of Sayana press (injectable contraceptive) but they had alternatives which they offered to clients who needed it.

The use of report and requisition (R&R) ensured a continuous supply of SRH/HIV commodities at sub-national level. In Lusaka, to reduce the workload for healthcare professionals, volunteers and a few clients (recipients) have been trained to administer Sayana press.

Sexual Reproductive Health Community Health Distributors

Community health distributors on the Copperbelt worked normally during the cholera epidemic as they didn't have a lot of cases to disrupt their work. However in Lusaka, disruptions in work were noticed as distributors were reassigned to assist in managing cholera and some stayed away for fear of contracting the disease.

One volunteer on the Copperbelt said, *"During Cholera, we worked okay but sometimes we didn't have commodities to distribute such as HIVT kits and condoms. However, we faced challenges during Covid-19 because of restrictions. Sometimes, we were not even allowed to collect SRH commodities from the facilities if we didn't have face masks. That affected our work a lot."*

4.3. Focus Group Discussions

1. Covid-19

Adolescents from Lusaka reported the availability of SRH and HIV commodities and services before the Covid-19 pandemic. However respondents from Kitwe described long standing resource constraints, with commodities taking long to arrive as well as limited variety in the types of commodities. The respondents also stated that the Covid-19 pandemic exacerbated the situation.

Challenges faced during Covid-19

Lusaka FGD

Adolescents reported that during the Covid-19 pandemic they faced significant challenges in accessing SRH/HIV commodities and services.

Restricted Movements

One major obstacle was the lockdown measures implemented to curb the spread of the virus. These restrictions made it impossible for them to access essential health services, as movement and travel were severely limited, and healthcare facilities operated on reduced schedules or were closed altogether.

Inadequate Human Resources

One participant stated that the traditional distribution channels for SRH/HIV commodities were disrupted while others indicated that the usual commodity distributors and service providers were unavailable, neither at health facilities nor in local markets, where they were typically accessible. *"The unavailability of distributors hindered us from accessing*

the commodities we needed especially condoms and HIV test kits," reported some participants.

Respondents also reported that many commodity distributors, including healthcare workers and community health volunteers, were either infected with Covid-19 or in self-isolation. This further exacerbated fears among end users, making them hesitant to visit health facilities to access SRH/HIV services. The perceived risk of exposure to Covid-19 at health facilities, coupled with the unavailability of commodity distributors, severely limited adolescents' access to vital health products and services.

Rumours and Myths

Other adolescents indicated that the Covid-19 pandemic created an environment of fear and mistrust among themselves in Lusaka, hindering their access to SRH/HIV commodities. *"One significant barrier was the circulation of myths that health facilities were infected with Covid-19."* Rumours about healthcare facilities being hotspots for Covid-19 transmission led many young people to avoid seeking essential health services, fearing contraction of the virus.

Expired Commodities

Despite the challenges posed by the Covid-19 pandemic, some adolescents in Lusaka reported that they were able to access SRH/HIV service during periods when lockdown restrictions were relaxed. However, they encountered another obstacle;

"*We faced another major issue – the commodities we accessed were often expired, especially condoms,"* one adolescent revealed. *"This was really concerning because it made us question the effectiveness and safety of the products. We worried that using expired condoms would put us at risk of unintended pregnancies, sexually transmitted infections (STIs), and HIV."* Another adolescent added, *"Unfortunately, some of us contracted STIs during that time, and others experienced unplanned pregnancies. It was terrifying to think that the very products meant to protect us might be harmful instead."*

Parental Restrictions

Another significant barrier to accessing SRH/HIV commodities and services was parental restriction. Adolescents reported that their parents or guardians did not allow them to freely visit health facilities, citing concerns about Covid-19 transmission. This limitation restricted adolescents' autonomy and ability to make independent decisions about their reproductive health.

The Covid-19 pandemic introduced additional barriers to accessing SRH/HIV commodities and services for adolescents in Lusaka. Some adolescents opted not to visit health facilities to access essential commodities due to fear of the mandatory Covid-19 testing requirement. This fear stemmed from concerns about testing positive, potential stigma, and uncertainty about subsequent procedures.

Financial Constraints

Additionally, financial constraints posed another obstacle. Many adolescents were barred from accessing SRH/HIV commodities and services because they could not afford masks, which were mandatory for entry into health facilities and public places. This prerequisite created an insurmountable barrier for young people from economically disadvantaged backgrounds, effectively denying them access to vital health services.

"School closures really affected our access to essential health commodities," one adolescent explained. *"We used to get condoms, contraceptives, and HIV testing information at school, but when schools shut down, we couldn't get those things anymore."*

Another adolescent added, *"It wasn't just condoms and contraceptives. We also lost access to other reproductive health commodities that were provided through school programs. It was like losing a lifeline."*

A third adolescent noted, *"We relied on our schools for more than just education. They were also a safe haven for us to get information and resources about our sexual and reproductive health. When schools closed, that support system disappeared."*

Others reported that changes in commodity distribution channels and personnel affected adolescents' comfort and willingness to access SRH/HIV commodities and services. Many reported feeling unease with the temporary distributors who took over during the pandemic, as the usual peer educators – who were relatable and trustworthy – were replaced and given forced leave. The substitutes, mainly nurses and hospital staff, lacked the familiarity and rapport that peer educators had established with the adolescents. This change created a barrier, as adolescents felt hesitant to approach unfamiliar distributors for sensitive and personal health services, further limiting their access to essential commodities and information.

Adolescents from Chilanga and Lusaka in a Focus Group Discussion

Kitwe FGD

Adolescents in Kitwe reported significant challenges accessing SRH and HIV commodities and services during the Covid-19 pandemic.

Restricted Movements

Firstly, restricted movements imposed during the pandemic hindered adolescents' ability to access essential commodities. The limitations on movement severely impacted their access to healthcare services.

Human Resource challenges

Corruption posed an additional barrier. Some adolescents revealed that certain healthcare providers demanded bribes in exchange for SRH/HIV commodities and service provision, exacerbating existing access challenges.

Another barrier stemmed from the providers' demographics. *"We couldn't access services because the providers were adults, and they were judgmental. This made us feel uncomfortable,"* an adolescent confessed.

Furthermore, adolescents expressed frustration with the temporary replacement of youth-friendly distributors. *"Our usual adolescent distributors were put on forced leave, and Neighbourhood Health Committee staff took over. However, they prioritized assisting older people instead of us. This change made it difficult for us to access the services we needed."*

Some adolescents reported that they were denied access to certain commodities due to age restrictions. They were told they needed parental consent, which was rarely provided.

One adolescent expressed, *"We couldn't access certain commodities because they told us we were under age and needed consent from our parents. Our parents sadly never gave this consent."* Another added, *"Some distributors were selective, they didn't want to interact with us citing that we would give them Covid-19."*

Unavailability of protective equipment

Another obstacle stemmed from the unavailability of face masks. Without masks, adolescents were denied entry to healthcare facilities, effectively blocking their access to vital commodities.

"*Even when commodities were available, distributors were prohibited from distributing them during the outbreak, making it impossible for us to access them,"* one adolescent reported.

Disruption of essential routine programs

The adolescents usually accessed most commodities through sensitization programs in schools. However, these programs were put on hold during the Covid-19 pandemic, making it difficult for them to access the commodities.

Adolescents from Kalulushi and Kitwe participating in a Focus Group Discussion.

2. Cholera

SRH and HIV services were readily available for the adolescents in Lusaka during the cholera epidemic. However, the respondents (adolescents) from Kitwe expressed challenges and limitations before the Cholera epidemic.

Challenges faced during Cholera epidemic

Lusaka

Disruption of SRH/HIV services

"During the cholera outbreak, accessing SRH/HIV commodities and services became almost impossible," one adolescent recalled. "*Youth-friendly spaces, where we usually got these commodities, were turned into cholera treatment centres. It was like our needs didn't matter anymore."*

Inadequate Human Resource

Another adolescent added, *"The distributors who were supposed to supply condoms, contraceptives, and other essential commodities just stopped showing up. No one made alternative arrangements to ensure we still got what we needed."*

Another adolescent explained, *"We were left with no one to turn to. The people responsible for providing our SRH/HIV commodities were focused on cholera, and rightfully so, but it felt like our health needs were forgotten."*

The cholera epidemic also disrupted SRH/HIV commodity supply chains as key contact persons responsible for coordinating commodity distribution were redeployed as cholera volunteers. This diversion of human resources, intended to address the urgent cholera crisis, inadvertently halted the supply of critical SRH/HIV commodities, leaving adolescents without access to essential health commodities reported adolescents in some parts of Lusaka.

Commodity Stock outs

Adolescents in the Lusaka FGD reported significant disruptions in accessing SRH/HIV commodities and services. Despite visiting health facilities, they found that clinics had run out of essential commodities, particularly contraceptives. The focus of healthcare commodities had shifted prioritizing cholera response efforts, resulting in stock outs and limited availability of SRH/HIV commodities and services.

Adolescents in Lusaka reported struggling to cope with the challenges posed by the Covid-19/Cholera epidemic. Unfortunately, this led to risky behaviors, with some adolescents engaging in unprotected sex, resulting in unwanted pregnancies. Additionally, others contracted sexually transmitted infections (STIs) due to unprotected sexual activities.

Participants in Lusaka shared various coping mechanisms during the Covid-19/Cholera epidemics. Some reported defaulting on Antiretroviral Therapy (ART) treatment during lockdowns, fearing contraction of Covid-19 at healthcare facilities. This disruption in treatment posed significant health risks.

Copying Mechanisms

Despite challenges posed by the cholera outbreak, adolescents in some parts of Lusaka reported that access to SRH/HIV commodities and services continued through peer educators. These educators delivered commodities directly to enrolled clients' doorsteps, ensuring uninterrupted access. However, this privilege was limited to already-enrolled clients, potentially excluding new or unregistered adolescents.

In another innovative adaptation, some adolescents indicated that they obtained SRH/HIV commodities through mosquito net distributors, who carried limited stock of SRH/HIV commodities. This unofficial distribution channel helped maintain access to essential services during the cholera epidemic.

In terms of contraceptive access, adolescents faced challenges. When male condoms were unavailable, female condoms were provided, but many adolescents were unfamiliar with their use, hindering effective protection.

In other parts of Lusaka, adolescents relied on Maternal and Child Health (MCH) days to access essential commodities. However, pandemic disruptions made commodity distribution unpredictable.

"We had to find ways to protect ourselves from STIs and unwanted pregnancies," one adolescent explained. "Some of us turned to Pre-Exposure Prophylaxis (PrEP) and Post-Exposure Prophylaxis (PEP) because we hoped it would keep us safe."

Another adolescent added, *"But others didn't have access to those options, so we used the withdrawal method instead. I know it's not the most reliable, but we didn't have a choice. We were desperate."*

A third adolescent noted, *"It's frustrating because we know there are better methods out there, but we can't get to them. So, we make do with what we have, even if it's not ideal."* To ensure continuity of care, some adolescents identified focal persons at healthcare facilities, such as peer educators, and directly contacted them for commodity access. This personalized approach helped bypass systemic disruptions.

In certain parts of Lusaka, adolescents leveraged commodities distributed during cholera mobilization efforts. These commodities, initially intended for cholera prevention, were repurposed to meet the adolescents' ongoing sexual and reproductive health needs.

Kitwe

SRH/HIV Logistical challenges

Although there were no significant restrictions, adolescents faced commodity stock outs at healthcare facilities. "We didn't have many restrictions, however, facilities usually didn't have the commodities we needed."

The suspension of outreach programs further limited access. Adolescents reported that outreach programs were stopped due to commodity shortages, effectively cutting off a vital supply channel.

Even when commodities were available, adolescents faced challenges accessing them due to rationing and prioritization. Facilities imposed daily limits, and older individuals were prioritized over adolescents, even when they arrived early. This resulted in adolescents being turned away without receiving the necessary commodities.

One adolescent noted that family planning options were severely limited, denying them the autonomy to choose their preferred method. *"When accessing family planning, you're supposed to choose which method you prefer, but we don't have that privilege. We usually find a limited number of family planning methods, which are in most cases imposed on us."*

Another adolescent emphasized that these challenges predated and persisted through the cholera outbreak. *"These are challenges we experienced before the cholera outbreak, during, and even after,"* they stated, highlighting the ongoing nature of these access barriers.

Copying Mechanisms

Adolescents in Kitwe shared various coping mechanisms for accessing SRH/HIV commodities and services during epidemics.

To address commodity shortages, some adolescents reported going to great lengths. They stated that they would visit peer educators' homes door-to-door, hoping to obtain leftover commodities from outreach programs.

However, one adolescent admitted, *"We just ignored the shortages and had unprotected sex anyway. It wasn't ideal, but we didn't see another option."*

Rationing was another strategy employed by adolescents. They reported that since commodity distribution was rationed, they had to equally ration their sexual activities.

An adolescent firmly stated, *"We abstained from sex, just like our peer educators taught us. It was the safest option."*

Others found alternative sources for essential commodities. Adolescents reported buying necessary commodities from nearby stores.

Support Suggestions

Lusaka

To maintain accessibility to SRH and HIV commodities and services, the adolescents suggested that protective gear (gumboots, rain coats) be given to peer educators to enable them to deliver these commodities to the adolescents especially in the cholera stricken areas during Cholera epidemics.

One Participant attributed their challenges mainly to the conversion of their facility into a cholera treatment center *"There is urgent need for creation of facilities/ centers specifically for adolescents to access SRH and HIV commodities and services. This will allow for us to continue accessing these services even when there is an epidemic."* One of the participants further went on to suggest the creation of hotspots; *"It would be very helpful if non-governmental organizations in conjunction with the ministry of health would train peer educators who can then be placed at different hotspots in the community to allow for easy accessibility of the SRH/HIV commodities and services."* Furthermore the adolescents stated that creation of youth friendly spaces and hot spots will help maintain access to these commodities because even in a pandemic, adolescents will be able to access these commodities through these centers because those spaces will strictly be for adolescents and only for SRH services. Therefore commodities will be readily available and adolescents will be able to visit these centers without fear of being screened for other diseases during epidemics.

The adolescents also suggested that a chain of supply for these commodities be created so as to allow continued supply of these commodities even amidst an epidemic.

Another participant suggested that supply of these commodities should be done in bulk and not seasonal, as seasonal supply of commodities leaves them stranded in cases such as the just ended cholera epidemic.

Another participant suggested that an app be created to make it easier for them to access theses commodities. *"An app should be introduced that can help the user locate a counsellor or community distributor so we can have commodities delivered to our doorstep. This will make maintaining access to these commodities and services easy."*

"The government should strictly supply commodities meant for us to youth/adolescent spaces so that they can last longer because when these commodities are taken to health facilities, they run out quickly because the adolescents aren't the only ones collecting this commodities," another participant responded.

Kitwe

Adolescent participants in Kitwe shared their insights on necessary support and policies to strengthen access to SRH/HIV commodities and services.

To address commodity shortages, adolescents reported that increasing stock levels and ensuring facilities order in bulk would significantly improve access.

One adolescent emphasized, *"There should be a mechanism where certain commodities are reserved specifically for adolescents, and ensure no hijackers. This way, we'll know that our needs are prioritized."*

Adolescents also reported that increasing the number of peer educators would provide more support and attention for their SRH/HIV needs.

Another adolescent suggested, *"Peer educators should do random distribution of commodities without waiting for us to visit the facilities. This would make it easier for us to access what we need."*

Furthermore, adolescents reported that employing youth-friendly contact persons at facilities would enhance their experience. This would involve replacing older personnel with individuals who better understand and relate to adolescents' needs.

5.0. Discussion

The Covd-19 pandemic and cholera epidemics have significantly disrupted the supply chain management of SRH and HIV commodities, exacerbating existing challenges in accessing essential healthcare. A critical factor contributing to this disruption, as highlighted by our research, is the unavailability of community health distributors. Our literature search and some of the respondents reviewed that the lack of distributors hindered access to necessary SRH/HIV commodities and services.

In general, these findings corroborated with existing literature, which underscores the fragility of health supply chains during crises. A study done by Lindberg (Lindberg, Bell and Kantor 2020) notes that Covid-19-related disruptions compromised the delivery of essential medicines, including SRH/HIV commodities and services (Steiner et al., 2023). Similarly, research conducted in South Africa and Zambia revealed significant disruptions to contraceptive services due to Covid-19 (Callahan et al., 2024).

It is clear from the literature that epidemics result in supply chain disruptions leading to increased lead time in the procurement process due to closure of manufacturing industries in order to comply with Covid-19 guideline. This was echoed in reports, which highlighted the impact of Covid-19 on SRH commodity supply chains, including disruptions to distribution networks (Ng'andu et al., 2022; Mmeje, Coleman and Chang 2020). The World Health Organization (WHO) also noted that Covid-19 strained global health supply chains, leading to shortages of critical medicines, including antiretroviral therapy (ART) and HIV testing kits (WHO 2020).

Stock outs of HIV testing commodities and ART may lead to treatment interruptions, increased morbidity, and mortality. Interestingly, during the Covid-19 pandemic, the reduction in HIV testing and viral load which was observed in some settings in SSA were not as a result of commodities stock outs but the disruptions in ART service provision where certain programs such as outreach activities were suspended to reduce Covid-19 transmission (Mude et al., 2023). This had far-reaching consequences which, compromised

the continuity of HIV treatment and reproductive health services to adolescents and young people.

In a similar manner, disruptions to contraceptive supply chains can result in unintended pregnancies and increased maternal morbidity and mortality (Callahan et al., 2024).
Strengthening supply chain resilience through diversified distribution networks and contingency planning is critical to ensuring uninterrupted access to essential health products even in the face of epidemics.

The Covid-19 pandemic and cholera epidemics severely impacted the availability of SRH/HIV commodities, leading to widespread stock outs, shortages, and rationing. Some respondents in the study reported experiencing significant challenges in accessing essential commodities, with distributors rationing distribution due to unavailability. The stock out of some commodities at primary healthcare level may have been as a result of lack or delayed ordering of these commodities since national level in Zambia as reported by ZAMMSA had adequate stocks of these commodities.
Stock outs and shortages of SRH/HIV commodities in some settings during the epidemics, compromised the continuity of critical services. In Kitwe however, it was reported that these stock outs and shortages were present even before the epidemics. Respondents reported that distributors limited the quantity of commodities distributed, prioritizing adults over adolescents. This rationing strategy, although intended to optimize scarce resources, exacerbated existing health disparities. A study in Uganda found that Covid-19 related stock outs of antiretroviral therapy (ART) resulted in treatment interruptions for 30% of HIV patients (Cassinath et al., 2022).

The rationing of SRH/HIV commodities had devastating consequences, particularly for vulnerable populations. Research in South Africa showed that contraceptive stock outs led to increased unintended pregnancies and maternal mortality (Callahan et al., 2024). These findings contradicted the results of a scoping review by Cassinath et al., (2022) which showed that the magnitude of disruptions of Covid-19 on family planning in some SSA countries was not as huge as initially anticipated.

The World Health Organization (WHO) noted that Covid-19 strained global health supply chains, leading to shortages of critical medicines, including ART and HIV testing kits (WHO, 2020). The UNFPA reported similar disruptions to SRH commodity supply chains, highlighting the need for urgent action. Contrarily, a study done across seven LMICs, reviewed that most health facilities (private and public) reported no disruption in contraceptive supplies (Karp et al., 2024). Similar findings were found in Nigeria (Adelekan et al., 2021). This might have been because in the countries under study, which included SSA countries, severe Covid-19 restrictions were not common and fundamental policy changes regarding SRH were enacted early (Plotkin et al., 2022).

Although the scale of commodity disruption during the cholera epidemic in Zambia was not as huge as during Covid-19, adolescents and young people in affected areas such as Lusaka still faced challenges in accessing SRH/HIV commodities and services resulting in possible unwanted pregnancies and therefore unsafe abortions, sexually transmitted infections (STIs), including HIV (Lewis et al., 2021).

Respondents reported that adolescents and young people faced significant barriers in accessing contraceptives, condoms, and HIV testing kits both during cholera and Covid-19, although the impact was more pronounced during the latter. This resonates with a study done in SSA indicating that Covid-19 had compromised SRH services for young people (Ng'andu et al., 2024).

The disruptions exacerbated existing health disparities among adolescents and young people which the WHO highlighted emphasizing the need for targeted interventions (WHO 2020).

Other long-term consequences of disrupted SRH/HIV commodity access and services highlighted in our research, include increased school dropout rates, economic burdens, and mental health concerns. Research supports these findings, indicating that unintended pregnancies and STIs can have lasting impacts on young people's education, employment, and well-being (Lewis et al., 2021).

Our study's findings underscore the urgency for tailored SRH/HIV interventions for adolescents and young people. This includes leveraging digital platforms, community-based distribution models, and youth-friendly services to ensure uninterrupted access to essential commodities.

6.0. Conclusion

The results of this study show that epidemics disrupt SRH/HIV commodity supplies and service delivery which in turn negatively affect the provision of quality services particularly to vulnerable groups such as adolescents and young people. To ensure uninterrupted supply of SRH and HIV commodities and service provision during epidemics, it is imperative to enact policies which will strengthen the supply chain for these commodities and contribute towards the establishment of resilient healthcare systems. It would also be prudent to leverage on existing strategies to ensure acceptability and sustainability of SRH/HIV programs.

7.0. Recommendations

Policy Makers

- Government should enact policies which will designate SRH/HIV commodities and services as essential services during epidemics and exempt them from movement restrictions, with clear guidelines and communication on continued access.
- Distributors of SRH/HIV commodities and services should be designated as essential workers and exempted from movement restrictions during epidemics. This will allow them to continue their critical work, ensuring uninterrupted commodity availability.

Healthcare Professionals

- Healthcare providers should be trained to provide remote counseling (Telehealth) and support to ensure uninterrupted access to life-saving commodities for adolescents and young people.

- To address the challenge of adolescents' inability to access SRH/HIV commodities and services due to lockdown measures and movement restrictions, healthcare providers should implement flexible and innovative distribution strategies, including mobile health clinics, community based distribution, online ordering with delivery or pick-up points, and partnerships with private sector entities.

- Healthcare providers should establish a robust and reliable distribution network, ensuring consistent availability of SRH/HIV commodities and services at healthcare facilities and community distribution points

- Healthcare providers should establish robust inventory management systems to monitor commodity expiration dates and ensure timely replenishment. Additionally, they should strengthen the supply chain logistics to prevent stockpiling and ensure commodities reach distribution points before expiration.

- Healthcare professionals in administration should conduct regular quality control checks and training for distributors on proper storage and handling practices.

- Health institutions should decouple SRH/HIV services from epidemic diagnostic test which are often shunned due to stigma.

Community

- Community health distributors should be provided with personal protective equipment (PPE) and trained on infection prevention, and flexible distribution strategies to maintain service delivery while minimizing risk.

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