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A snapshot of Research on COVID-19 in Zambia

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TABLE OF CONTENTS

EDITORIAL

A snapshot of COVID-19 in Zambia one year since its first two cases were recorded 1
M L Mazaba

ABSTRACTS

Hygiene Behaviour Change in Response to COVID-19 in Zambia: A cross-sectional survey 3
Hamoonga R, Mbewe T, Chilala B, et al.

Changes In HIV Differentiated Care Utilization During The Covid-19 Pandemic In Zambia 4
Joa Y, Phirid B, Rosena S, et al.

Learning from Rapid Data to Inform Policy on COVID-19 in Zambia 5
Warren S, Parkerson D, Collins E, et al

Implementation and Evaluation of a Teleneurology
Clinic Serving Vulnerable Populations in Zambia During the COVID-19 Pandemic 6
Asukile M, Chishimba L, Chomba M, et al

RESEARCH ARTICLE

Progress towards eliminating mother-to-child transmission of HIV in the Macha area in Zambia from
2010-2018 7
Hamahuwa M, Chalwe V, Sutcliffe CG

A SNAPSHOT OF COVID-19 IN ZAMBIA ONE YEAR SINCE ITS FIRST TWO CASES WERE RECORDED

Editorial

By : M L Mazaba

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A snapshot of COVID-19 in Zambia one year since its first two cases were recorded
Zambia recorded its first 2 cases of COVID-19 in March 2020 and a year into the pandemic had recorded a cumulative 85,889 cases and 1,175 deaths. Of the Deaths, 645 were COVID-19 deaths and the rest were associated with COVID-19 being a secondary co infection not attributed to the death. An average recovery rate of 94% was observed over the year.
Two peaks, were observed the second wave being larger than the first (figure 1). The second wave was characterized by more cases, increased numbers of patients with severe diseases and a large proportion in critical condition. The death toll also increased during the second wave (figure 3). The factors attributed to the increased second wave include the introduction of new COVID-19 variants, and laxity in compliance to COVID-19 prevention prescribed public health measures.
Zambia continues to experience an ongoing outbreak. Continued surveillance and case finding, testing, isolation or quarantine of positive cases as well as community engagement remain key in averting further transmission of disease.

Figure 1: a snapshot of the epidemic



Figure 2: COVID-19 Cases by Date of Confirmation in Zambia, Mar 2020 - Mar 2021

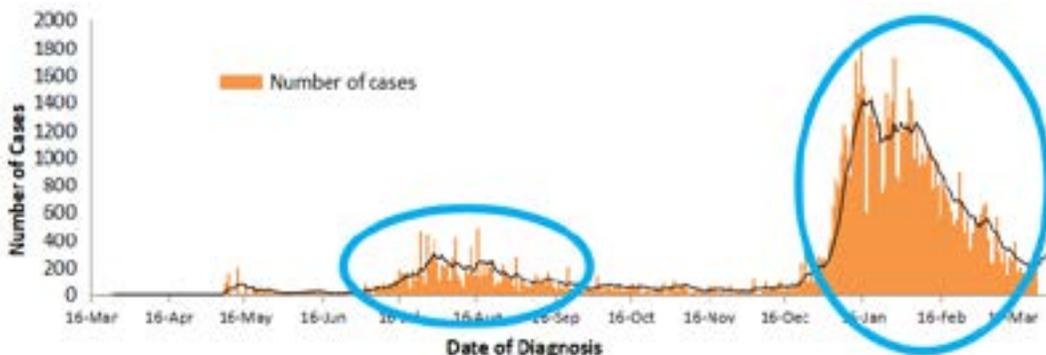
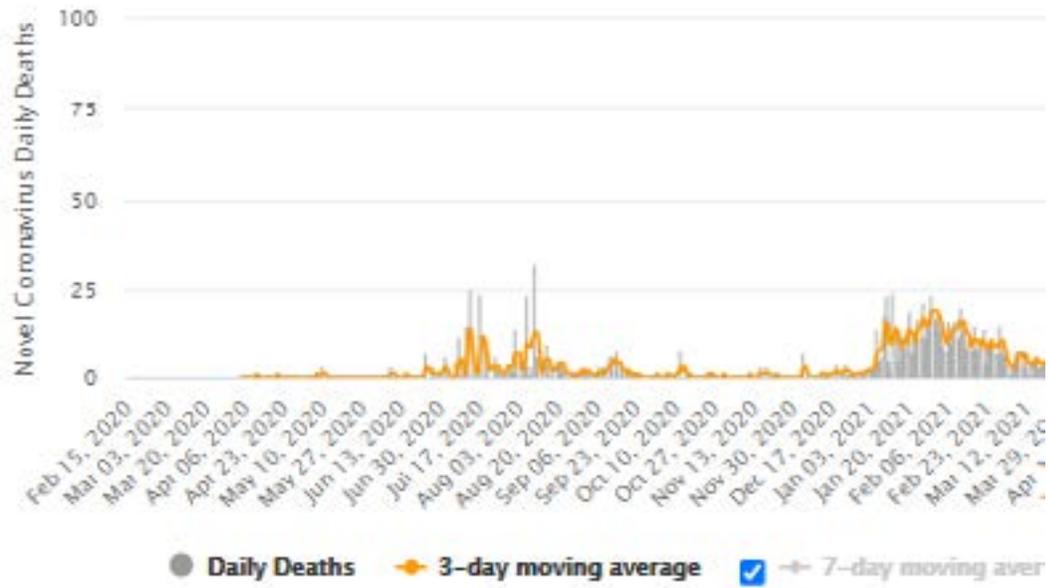


Figure 3: COVID-19 deaths in Zambia, Mar 2020 – Mar 2021



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HYGIENE BEHAVIOUR CHANGE IN RESPONSE TO COVID-19 IN ZAMBIA: A CROSS-SECTIONAL SURVEY

Abstract

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Citation Style For This Article: Hamoonga R, Mbewe T, Chilala B, et al. Hygiene Behaviour Change in Response to COVID-19 in Zambia: A cross-sectional survey. . Health Press Zambia Bull. 2020; 05(01); pp 3.

Introduction

The success of Zambia's COVID-19 response is premised on communities adhering to good hygiene practices. Specifically, communities have been urged to follow the five golden rules: 1) Wear your facemask correctly and consistently; 2) Maintain physical distance; 3) Wash your hands frequently with soap and water or use hand sanitizer; 4) Avoid crowded places and stay at home; and lastly let me stress the need to 5) Seek medical attention early if you are symptomatic However, mere provision of WASH facilities as part of this response is inadequate in ensuring adoption of sustainable preventive behaviours.

Methods

We report the results both formative research and a cross-sectional study to assess the ongoing effect and outcome of hygiene response to COVID-19. Data recorded among members of the public included the current level of understanding on hygiene behaviours linked to COVID-19, the prevalent barriers, motives and preferred touch points.

Results and Conclusions

Our results support the convention that mere provision of WASH facilities as part of the COVID-19 response is inadequate in ensuring adoption of sustainable preventive behaviours.

Acknowledging that the general public might have been exposed with multiple interventions promoted by various partners, there is therefore need to develop a targeted behaviour change strategy based on the opportunity, ability, and motivation theoretical framework.

CHANGES IN HIV DIFFERENTIATED CARE UTILIZATION DURING THE COVID-19 PANDEMIC IN ZAMBIA

Abstract

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Policy summary information

Differentiated service delivery (DSD) models aim to lessen the burden of HIV treatment on patients and providers in part by reducing requirements for facility visits and extending dispensing intervals. With the COVID-19 pandemic, minimizing patient contact with healthcare facilities and other patients while maintaining treatment continuity and avoiding loss to care has become more urgent, resulting in efforts to expand DSD. In March 2020, the Zambian Ministry of Health urgently promoted 3 - and 6- month dispensing for patients on antiretroviral treatment (ART). We assessed the extent to which DSD coverage and ART dispensing intervals have changed during the COVID-19 pandemic in Zambia.

Background/Introduction

Differentiated service delivery (DSD) models aim to lessen the burden of HIV treatment on patients and providers in part by reducing requirements for facility visits and extending dispensing intervals. With the COVID-19 pandemic, minimizing patient contact with healthcare facilities and other patients while maintaining

treatment continuity and avoiding loss to care has become more urgent, resulting in efforts to expand DSD. In March 2020, the Zambian Ministry of Health urgently promoted 3 - and 6-month dispensing for patients on antiretroviral treatment (ART). We assessed the extent to which DSD coverage and ART dispensing intervals have changed during the COVID-19 pandemic

Methods

We used patient data from SmartCare, Zambia's electronic medical record system, for 737 health facilities, representing about 3/4 of all ART patients nationally. We compared the numbers and proportional distributions of patients enrolled in DSD models by different duration of drug dispensing between February 15 2020 and October 30 2020, 8 months after the first recorded COVID-19 case in Zambia on March 18, 2020.

Results

The number of patients enrolled in any DSD model increased by 60% between February and October, from 134,652 (18% coverage) to 215,947 (29% coverage).

Home ART delivery saw the greatest percent increase in utilization from 875 to 2,978 (240%), while community adherence groups experienced the smallest change from 8,437 to 9,989, an increase by 18%, potentially a reflection of efforts to discourage group models due to COVID-19 transmission risk. Although 6-month dispensing is Zambia's national policy for stable patients, the proportion of patients receiving 6-month supplies fell from 57% to 49%, while the proportions of patients receiving a 1, 2 or 3 -month supplies rose. The shortening of dispensing intervals is primarily due to patients switching temporarily from dolutegravir back to tenofovir- efavirenz to due to concerns about global d.

Conclusion/Recommendations

The months of the COVID-19 pandemic showed increased participation in DSD models for stable ART patients in Zambia but shorter dispensing intervals. Efforts to eliminate obstacles to longer dispensing intervals should be prioritized to achieve the expected benefits of DSD models and minimize COVID-19 risk.

Abstract

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1 Innovations for Poverty Action

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Tracking how people's lives are affected by the COVID-19 pandemic enables policymakers to assess the situation in their countries and make data-driven policy decisions. To respond to this need, Innovations for Poverty Action (IPA) implemented the Research for Effective COVID-19 Responses (RECOVR) panel survey in Zambia to facilitate comparisons, document real-time trends of policy concern, and inform decision-makers about the communities that are hardest-hit by the economic toll of the pandemic. IPA conducted the RECOVR survey from June 15-July 6, 2020 (Round 1) and November 28-December 21, 2020 (Round 2). The surveyors employed a random digit dialing to obtain a nationally representative sample of mobile phone numbers. The survey rounds document varied adherence to disease prevention measures, as well as severe negative shocks to employment, income and food security. This abstract focuses on the results from the health and COVID-19 mitigation survey modules and identifies areas for future engagement.

Planning was used for data collection. Data were analyzed using Statistical Package for the Social Sciences version 23.0. Chi-Overall, respondents are largely aware of COVID-19 risks but seem to

be heeding only certain self-protection measures, though such behaviors and perceptions are by no means uniform. The proportion of respondents who say they feel their household is at risk of contracting COVID-19 increased by 10pp, from 37 percent to 47 percent. At the same time, the proportion of respondents that indicate going outside the home every day in Round 2 increased by 41 percentage points (pp) from 16 percent to 57 percent. The survey also indicates that the proportion of respondents reporting usage of homemade facemasks decreased by 16pp, while the proportion using medical facemasks increased by 10pp, indicating a change in the types of facemasks respondents report using.

Encouragingly, 75 percent of respondents said they would take a COVID-19 vaccine once it is available, and 76 percent similarly would vaccinate their children, with no significant differences by socioeconomic status or gender. Respondents cite self-protection as the most important reason for getting the vaccine. Nevertheless, less than half of respondents strongly agree that the vaccine is safe (44 percent) and effective (45 percent), suggesting that continued public health messaging around vaccine information is critical. Sixty five percent of respondents indicate that they

trust doctors and healthcare professionals for vaccine information, suggesting that the Ministry of Health is well-positioned for public health messaging around future immunization campaigns.

With the above results in mind, the Ministry of Health and other partners should continue to promote and enhance clear and actionable health messages on COVID-19 prevention. The Ministry should also incorporate such messaging and information awareness for eventual immunization campaigns. Finally, results from the survey also indicate that the pandemic has increased financial stress of households, including effects on food security (e.g. amount of food consumed), which, for households with school-aged children can threaten children's nutrition and development. Therefore, in addition to the efforts that the Ministry of Health is taking in dealing with COVID-19, the Government of Zambia should consider strengthening existing multisectoral approaches to ensure that financial needs for the most vulnerable households are met. Additionally, Cash transfers which Zambia is already rolling out boost food security and can also be leveraged to increase uptake of preventive behaviors.

Abstract

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Background

Telemedicine increased during the COVID19 pandemic as a safe and feasible alternative to in-person care but was limited to high-income settings. Zambia has only eight neurologists and one crowded outpatient neurology clinic. The suspension of this clinic during the peak of COVID19 resulted in the urgent need for an alternative, and so a telemedicine solution was implemented. Our aim was to evaluate patient and physician acceptance of and satisfaction with teleneurology visits for adults usually attending in-person visits at the University Teaching Hospital (UTH) Neurology Clinic in Lusaka, Zambia.

Methods

Patients scheduled for neurology outpatient appointments in June and July 2020 and those with missed

appointments between March and May 2020 were called to ask if agreeable to a televisit. Neurologists conducted teleneurology visits over the phone, WhatsApp video, or Zoom calls, based on patient accessibility, and they documented visit outcomes. Data on patient and provider satisfaction were collected through telephone and online surveys, respectively.

Results

Of 300 patients, 186 (62%) were reachable, and 74% (133) of those alive agreed to a televisit. Stroke (30%), seizures (20%), and headache (16%) were the commonest diagnoses. Most televisits (80%) were by telephone call, 14% by WhatsApp video and 6% by Zoom. Sixty patients and seven neurologists completed satisfaction surveys. Neurologists reported greater

confidence in their assessment with Zoom calls. Televisit outcomes showed 30% of patients were stable and discharged to their local clinic, 32% only required medication refills, and 19% required an in-person visit. Patients who preferred televisits noted they were less expensive and less time-consuming, while those preferring in-person visits cited desire for a physical examination. Overall, 98% of patients and 100% of physicians were satisfied with televisits.

Conclusion/Recommendations

Teleneurology visits were an acceptable means of service provision for adults attending the UTH neurology clinic. They are a promising supplement to in-person visits in resource-limited settings, even when video-call support is absent.

Abstract

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Citation Style For This Article: Hamahuwa M, Chalwe V, Sutcliffe CG. Progress towards eliminating mother-to-child transmission of HIV in the Macha area in Zambia from 2010-2018. . Health Press Zambia Bull. 2020; 05(01); pp 7-12.

Abstract

Prevention of mother-to-child transmission of HIV (PMTCT) services is important in achieving national targets as well as global targets for 90% coverage and less than 5% mother-to-child transmission of HIV. In Zambia, there has been evidence of improvement in PMTCT coverage at national level with fewer studies done at local level. The study aims to address the gap, by assessing improvement in PMTCT coverage in Macha area. Cross-sectional study was conducted of HIV-infected mothers bringing their infants for early infant diagnosis at Macha Hospital from 2010 to 2018. Data from 1,175 mother-infant pairs was analysed. The majority of the mothers (85%) and infants (75%) received ARVs. The proportion of mothers that received combination antiretroviral therapy (cART) increased from 2010 (28%) to 2018 (91%). The proportion of infants testing positive decreased from 12% in 2010-2013 to 4% in 2016-2018 ($P < 0.0001$) and differed significantly by maternal receipt of PMTCT (38% vs. 2% for none and cART respectively [$P < 0.0001$]). Comparing data collected at different time periods indicates that significant improvement has been made in Macha from 2010-2018. To continue with these gains, a concerted focus will be needed to target and improve on the integration of new guidelines into clinical practice at a facility level.

Introduction

A number of children that are living with HIV are infected through mother-to-child transmission (MTCT), during pregnancy, at delivery or through breastfeeding; which is often referred to as 'parent-to-child transmission or vertical transmission'[1]. Transmission of HIV from the mother to

the child can be significantly minimized if expecting mothers have access to PMTCT services during pregnancy, delivery and breastfeeding [2]. Scaling up of antiretroviral therapy is said to be on a fast-track trajectory which has surpassed expectations [2] leading to a significant decrease in the number of infants that are becoming newly infected with HIV. A major challenge, nevertheless, still remains in the transmission of HIV from mothers to their infants [3]. At the end of 2017, an estimated 36.9 million people were living with virus; with 1.8 million being newly infected globally. In 2017, the proportion of HIV-infected adults and children (aged between 0 to 14 years) who were receiving ART was 59% and 52%, respectively, and the ART global coverage for pregnant HIV-infected women and breastfeeding mothers was 80% [2]. In 2017, an estimated 180,000 children were living with HIV and 130,000 of these children live in Eastern and Southern Africa [4]. In 2017 in Zambia, 92% of women infected with HIV were receiving antiretroviral drugs for PMTCT, and 46,100 children between 0-14 years of age were on ART, accounting for 64% coverage [5].

Without having any intervention put in place, in low and middle income countries where breastfeeding is very common MTCT rates are approximately 25-45%. In industrialized countries where infant replacement feeding is more readily available MTCT rates are approximately 15-25% [6]. At the height of the epidemic, paediatric HIV threatened to reverse the achievements that had been made in managing child mortality in African countries with a high HIV prevalence. In southern Africa, 20% of child mortality was due to HIV

whereas globally it was 3% [6]. The international community recognized the threat, which spurred advocacy and financial and political resources to minimize and eventually eliminate transmission of HIV from the mother to the child [7]. Impressive declines of vertical transmission rates have been due to changes in treatment regimens over the past years with regards to PMTCT. In 2015, a majority of pregnant women that had HIV were given antiretroviral drugs. Most PMTCT programs are evaluated through measurement of process leading indicators, such as the accepting pace to test for HIV and be counselled and the percentage of women who are found with the HIV virus and are given ARV drugs.

Changes in PMTCT guidelines

Starting from 2010, Zambia, like many other countries, based its PMTCT national policies on interventions put forward by the World Health Organization (WHO). WHO recommendations were that pregnant women infected with HIV and have a CD4 count ≥ 350 cells/mm³ or clinical stage 3 or 4 were being treated with a triple ART regimen. There were two options for prophylaxis for those whose CD4 counts were >350 cell/mm³ and clinical stage 1 or 2: Option A included zidovudine (AZT) which was started in the antepartum as early as 14 weeks of gestation, individual dose nevirapine (NVP) and beginning of AZT/3TC (lamivudine) in the intrapartum and a continuation in the postpartum periods with AZT/3TC for 7 days [8]. A triple ART regimen was included in option B, which was started during gestation as early as 14 weeks and this, was continued till after giving birth or 1 week after cessation of breastfeeding (WHO 2010). With both

options, infants received ARV prophylaxis. During the 19th International AIDS Conference in Washington DC (AIDS 2012), there was a call by UNICEF that ART programmes be transformed into PMTCT programmes in order for the HIV targets to be met globally. Evidence was mounting that a new model for preventing HIV transmission from the mother to the child was more effective than either Options A or B: starting lifelong ARV treatment in pregnant women infected with HIV, regardless of their CD4 count [9]. Option B+ was adopted by the WHO; which is a single universal regimen for treating pregnant women infected with HIV prescribed as soon as they are found positive with HIV (done at any stage of development during pregnancy age); treatment continues for life in settings which have the capacity to initiate and monitor the mother on triple therapy [9]. The model minimized obstacles and delays in initiating treatment in settings with low resources, thereby lowering risks of drug resistance developing with interruptions in ART with each pregnancy [8]. The intention for this significant change was that maternal health should be optimized, and that HIV transmissions should be prevented during current and future pregnancies. In 2015, WHO recommended that all HIV-infected pregnant women be provided with Option B+.

Improvement in PMTCT coverage

In recent years there has been a general increase in the number of women accessing PMTCT programmes. The percentage of HIV-infected pregnant women receiving ART in 21 of the 22 priority countries in the global plan doubled from 36% in 2009 to 80% in 2015. Of more importance is that 93% of pregnant women were receiving ARVs for treatment, an increase from 73% in 2014 [1]. Zambia adopted the Option B+ model on January 14, 2013, although some areas within the country lagged behind in implementation. Findings show that there was an increase in the number of pregnant women accessing PMTCT from 87% in 2016 to 92% in 2017, resulting in a reduction in the risk of mother-to-child transmission (MTCT) [1].

Studies from sub-Saharan African countries have documented the impact of these policy changes on PMTCT uptake and the rate of MTCT. Kenya has seen a decline in the number of infected infants

due to PMTCT policy changes. A study done by Ruby and colleagues provides evidence on how hospitals in Kenya are moving in the right direction in regards to coverage of PMTCT, provision of Option B+, and earlier ART initiation. He says compared to the earlier analysis, a higher proportion of mothers received any ART regimen (83.1% in 2010-2013 and 91.1% in 2013-2016), as well as desired Option B+ regimen (19.6 vs 56.2 2010-2013 and 2013-2016 respectively) This resulted in a decrease in the number of HIV-infected infants being born (from 5.9% in 2010-2013 to 4.3% in 2013-2016) [8]. South Africa has experienced impressive PMTCT outcomes during a period in which PMTCT guidelines were implemented. A study done by Goga and colleagues provides evidence of triple ART coverage of U93% by 2015/16. Nationally, the rate of MTCT plummeted from 25-30% before 2001 to an estimated 1.4% in 2016 [10].

Methods

Study design

A cross-sectional study of the data drawn from the three studies (DBS, EID and NSEBA) of HIV-infected mothers bringing their infants for EID at Macha Hospital.

Study setting

The study utilized secondary data collected from three studies that were done at the ART clinic at Macha Mission Hospital in Choma District of Southern Province, Zambia between 2010 and 2018. Macha Mission Hospital is approximately 72 kilometres and 350 kilometres from Choma and Lusaka towns respectively. The area is primarily inhabited by subsistence farmers who live in small, scattered homesteads [11]. Macha Mission hospital is managed by the Brethren in Christ Church (BIC) but functions within the Ministry of Health Zambia's health care system. It is a district level hospital with a catchment of 150, 000 persons and also serves as a referral hospital for the surrounding rural health centres that are within the radius of 80 kilometres (12). Macha Mission Hospital has been operating an ART clinic which provides PMTCT programmes, care and treatment of HIV-infected people since 2005 (12). Since 2008, EID has been accessible with HIV DNA testing being done from the central laboratory, first in Lusaka and later in Livingstone. Pregnant and breastfeeding HIV-infected

mothers and their infants' access care in line with the MOH Zambia and WHO guidelines[13] [14].

Study procedure

Data from three studies conducted at Macha Hospital was used for this study; all mother-infant pairs that visited the ART clinic from August 2010 to August 2018 and had complete data, were included in the analysis.

The DBS Study

A chart review was done at the ART clinic in Macha. Data abstraction was done from the laboratory log books for all the dried blood spot (DBS) specimens that were collected at the clinic for HIV diagnosis in infant between 2010 August and 2013 March. The information that was collected routinely in the DBS tracking register included file number, date of birth, sex, sample collection date, date sample arrived at the central laboratory in Lusaka, and date when the specimen were processed. A medical chart review was done on all the infants that had DBS specimens collected. This was done to be sure of the infant's sex, date of birth and collection of maternal and infant receipt of drugs for PMTCT information. Data was entered in duplicate using EpiInfo.

The EID and NSEBA Study

The Early Infant Diagnosis (EID) study was done at the ART clinic at Macha Mission Hospital from April 2013 to October 2015. The Novel Screening for Exposed Babies (NSEBA) study was done at the ART clinic at Macha Mission Hospital from February 2016 to August 2018. Both studies followed similar procedures. All mother-infant pairs who presented for early infant diagnosis were eligible and approached for enrolment. A written informed consent was obtained from all the women agreeing to take part in the study. A questionnaire was administered after enrolment by study assistants to obtain demographic data and a medical chart review was done. Information collected included: antenatal care attendance, PMTCT received or not by the mother/infant and PMTCT regimen. Blood was collected from the infant by means of heel stick as part of clinical requirement for care and stored as a dried blood spot card in the laboratory. DBS cards were sent in batches to the central laboratory for HIV DNA testing using the Roche Amplicor HIV-1 DNA test v1.5 (Roche Molecular System, Switzerland).

Information recorded in the laboratory log book as the DBS was being collected was recorded for the study and included date of birth for the child, clinic number and date sample collected. When the DBS results (these are usually in batches) were brought to the clinic, the results were also recorded for the study. All the data collection forms for the study were double entered in EpiInfo and compared for discrepancies as a way of ensuring data quality management.

Sample size and selection

The three studies used a convenience sample of participants for the study. This is a method where participants who are readily available or accessible to the research are selected [9]. While information on all pregnant women infected with HIV and their infants was desirable, only women accessing services for EID were enrolled due to feasibility and logistical constraints. All participants with completed data from the three studies were included in the analysis.

The formula used for calculating the sample size was as shown below:

$$= Z^2 * P(1-P) / e^2$$

Where:

Z == Z-score

P = population proportional or sample proportional

e = margin of error and N = the population size.

Data management and analysis

Data from the three studies were exported from EpiInfo to excel files, cleaned and merged into one dataset. The PMTCT regimen for each mother was classified as none, single dose nevirapine, short course ART (when a mother would take one or two ARV drugs for a short period during pregnancy until delivery or breastfeeding), and triple regimen ART (when a mother initiates combination antiretroviral therapy (cART) prior to or during pregnancy). Children were considered diagnosed with HIV if they have a positive HIV DNA test. Descriptive statistics, inclusive of chi-square tests for variables that are categorical, were used for the analysis to compare the proportion of women receiving each regimen and the proportion of infants diagnosed with HIV

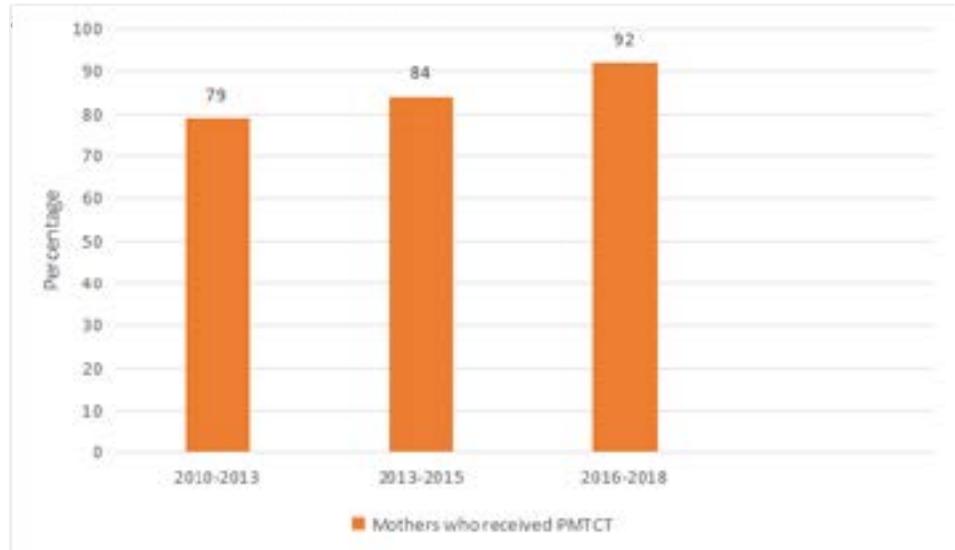


Figure 1: Proportion of HIV-infected mothers who received PMTCT in the Macha area by time period.

diagnosed with HIV was compared by PMTCT regimen. All analyses were conducted using SPSS Version 16 and Stata Version 12 statistical packages.

Ethical Consideration

The DBS, EID and NSEBA studies were approved by the Institutional Review Boards at the Johns Hopkins Bloomberg School of Public Health and Macha Research Trust. The studies were additionally approved by the Ministry of Health of Zambia (DBS and EID studies) and the National Health Research Authority (NSEBA study- MH/101/23/10-1).

Clearance and approval for this analysis was received from the University of Lusaka under the Department of Public Health and the Principal Investigators at Macha research Trust and Johns Hopkins Bloomberg School of Public Health.

Results

A total of 1,205 mother-infant pairs were enrolled in the three studies (403 from the DBS study, 502 from the EID study and 300 from the NSEBA study). For this study 1,175 mother-infant pairs with available HIV DNA test results were included in the analysis; 394 from the DBS study (2010-2013), 494 from the EID study (2013-2015) and 287 from the NSEBA study (2016-2018). The median age for the infants was 6 months (interquartile range [IQR]: 2.4, 7.2), with 592 (50%) being males. The characteristics of the mothers and infants are presented in (Table 1).

Adherence to PMTCT guidelines from 2010-2018

A large number of mothers (992, 84%) were receiving ART at time their infants were tested. Most mothers (997, 85%) mothers received ARVs for PMTCT, with 772 (66%) receiving cART, 216 (18%) receiving short course ART, and, 9 (1%) receiving single dose nevirapine (Table 1). Only 177 (15%) of mothers did not receive PMTCT (one mother was missing information on PMTCT). Similarly, most infants 884 (75%) received their postpartum ART prophylaxis.

Trends in PMTCT guidelines

The number of HIV-infected mothers that received any PMTCT increased per time period; from 79% in (2010-2013) to 92% in (2016-2018).

The distribution of PMTCT regimens was different by time period (Figure 2); in 2010-2013, the majority of mothers were receiving short course ART. By 2016-2018, the majority of the mothers were receiving cART. The proportion of mothers receiving cART increased from 28% in 2010-2013 to 92% in 2016-2018 (P<0.0001).

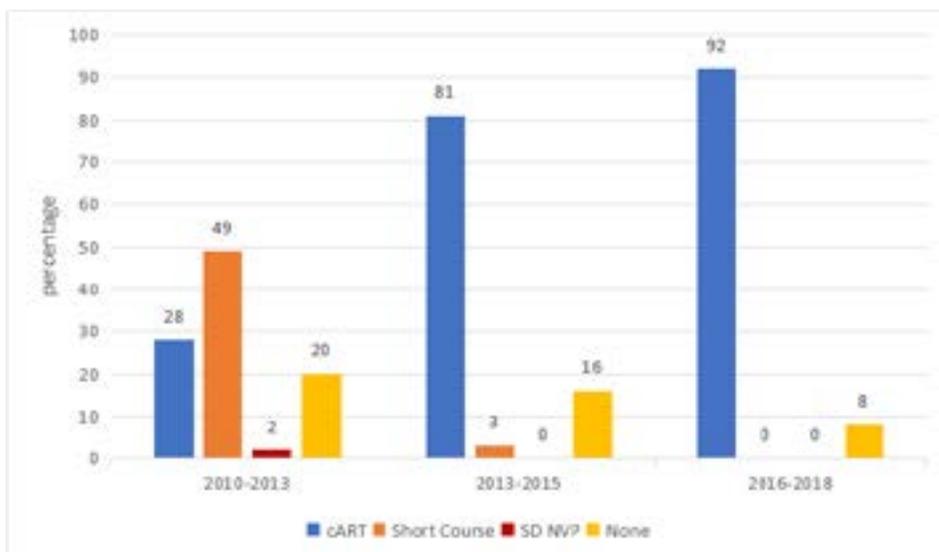


Figure 2: Distribution of maternal PMTCT regimens by calendar year

Note: One mother (2010-2013) was missing information on PMTCT (0.25%). None were on SD NVP (2013-2015), short course and SD NVP (2016-2018).

Using 95% CI, the sample size for this study was found to be 598. The sample size was done to demonstrate the minimum sample to be studied, but since the study used secondary data more participants were included in the analysis so as to improve the power of the study for statistical inference.

Source: <https://www.surveymonkey.com/mp/sample-size-calculator>

Estimated population size for Macha	150,000
Margin of error	4%
Z-score at 95% confidence interval (CI)	1.96
Population proportional	0.5

Table 2: Characteristics of HIV-infected mothers and HIV-exposed children in the Macha area, 2010-2018

Characteristics of the mother	N (%)
Mother currently on ART	992 (84%)
Mother received PMTCT	
None	177 (15%)
Short course	216 (18%)
cART	772 (66%)
Single dose NVP	9 (1%)
Missing information on PMTCT	1 (0.1%)
Characteristics of the Child	
Male sex	592 (50%)
Median age in months (IQR)	6 (2.4, 7.2)
Child received PMTCT	884 (75%)
HIVDNA results- positive	101 (9%)

Trends in infant HIV testing and transmission

From 2010-2018, 101 (9%) infants tested positive for HIV (1% had an invalid test result). The proportion of infants testing positive decreased from 12% in 2010-2013 to 4% in 2016-2018 ($P < 0.0001$; Figure 3).

The proportion of infants who tested positive differed significantly by maternal receipt of PMTCT. Among infants whose mothers did not receive any PMTCT, 38% tested positive, compared to 2% among infants whose mothers received cART for PMTCT ($P < 0.0001$).

Discussion

Data from this study showed that there was improvement in PMTCT coverage in the Macha area from 2010 to 2018. The proportion of mothers who received any ART regimen during pregnancy increased significantly per time period from 79% in 2010-2013 to 92% 2016- 2018. This was due to policy changes which occurred from 2010-2018. We see that the distribution of PMTCT regimens differed by time period (Figure: 2); in 2010-2013 the majority of the mothers (49%) were receiving short course ART and this is because in 2010 Zambia based its PMTCT national policy on the World Health Organization recommendations that only pregnant women infected with the virus and have a CD4 count $M350$ cells/mm³ or clinical stage 3 or 4 could be treated with a triple ART regimen. By 2016-2018, the majority of the mothers (92%) were receiving cART as Zambia changed its PMTCT national policy guidelines to adopt Option B+ on January 13, 2013. Option B+ is a single universal regimen for treatment of pregnant women infected with HIV.

prescribed as soon as they are found positive with HIV (done at any stage of development during pregnancy age); treatment continues for life [9].

The Macha area has seen a decline in MTCT of HIV (12% in 2010-2013 to 4% in 2016-2018- Figure 3) along with the changes in maternal PMTCT regimen. The decline seen is due to formulation of aggressive political led multi-sectorial efforts; the prevention efforts that were put in place such as coming up with a structure within the Zambian government

to provide policy direction in relation to HIV and the coordination for the multi-sectorial efforts, scaling up of HIV testing and counselling, ART and PMTCT and the rolling out of EID and strategies to improve its use [9]. Infants born to mothers that did not receive any PMTCT regimen were more likely to test positive compared to infants born to mothers that received any PMTCT regimen (38% vs. 3% respectively). This in itself clearly shows that the Macha area is on the right track in scaling up PMTCT programmes, and is contributing towards the UNAIDS 90-90-90 targets (of having 90% of the people living with HIV knowing their status and 90% of those people who know their status accessing ART and 90% of those accessing ART with a suppressed viral load) [14] of ending the AIDS epidemic by the year 2030.

Although these data indicate achievement of 90% coverage of PMTCT in the Macha area, ensuring more widespread and consistent use of the Option B+ regimen is needed to make further progress. Continuous coverage of PMTCT and achieving early initiation of Option B+ in pregnancy should remain an important focus for Zambia [9]. Concerted efforts are required to achieve the goal of universal access to ARV drugs, treating and preventing HIV, and ultimately ending the HIV epidemic by 2030 [15].

Conclusion

This study provides evidence that the Macha area is moving in the right direction with regard to PMTCT coverage, provision of infant ARV prophylaxis and recommended Option B+ regimen. The majority of the infants received HIV prophylaxis and the most important thing to note is that there was a significant decrease in the proportion of infants that tested positive.

The government of Zambia, through the Ministry of Health, should protect these gains in their PMTCT services and strengthen strategies to improve on eMTCT.

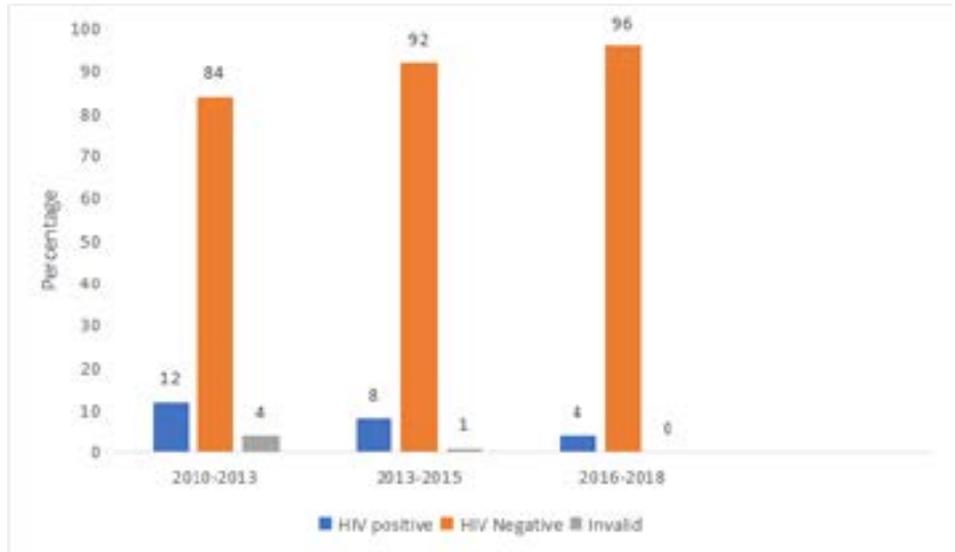


Figure 3 Proportion of infants diagnosed with HIV by time period

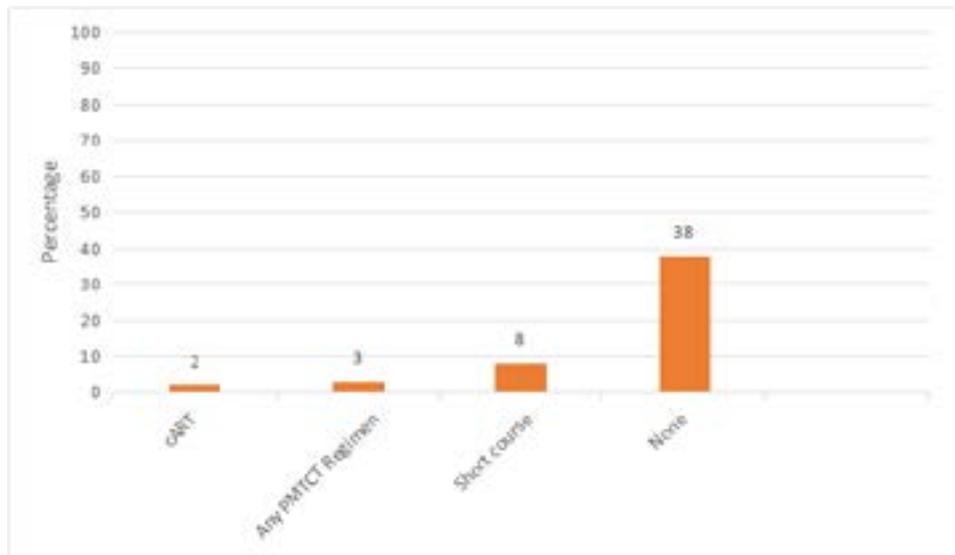


Figure 4: Proportion of infants diagnosed with HIV by maternal PMTCT regimen

Note: Mothers who took SD NVP or had missing information no infant was diagnosed with HIV

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