CIDRZ
for a healthy Zambia

2022 - 2023 ANNUAL REPORT

Strengthening collaboration and partnerships for greater impact in Zambia and beyond

CIDRZ

for a healthy Zambia

A Zambia and a region, in which all people have access to quality healthcare and enjoy the best possible health.

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Our Vision

A Zambia, and a region, in which all people have access to quality healthcare and enjoy the best possible health.

Our Mission

To improve access to quality healthcare in Zambia through innovative capacity development, exceptional implementation science and research, and impactful and sustainable public health programmes.

Our Core Values

Accountability
Our staff members embody ownership and embrace accountability for their contributions and decisions.

Equality
CIDRZ fosters a culture of fairness and equal opportunity.

Honesty
Our staff members consistently uphold integrity and transparency in all their activities.

Productivity
Our team strives for excellence and consistently delivers high-quality results.

Respect
We nurture a workplace culture where all individuals, including partners and stakeholders, are valued and their differences are celebrated.

Transparency
Our organization embraces open communication and fosters an environment for constructive, open, and honest problem solving.

Who We Are

The Centre for Infectious Disease Research in Zambia (CIDRZ) is an independent non-governmental organisation committed to answering key research questions relevant to Zambia and the region. CIDRZ supports local ownership of high quality, complementary, and integrated healthcare research and services within the Zambian public health system and facilitates clinical, research, and professional development training.

CIDRZ has over twenty years of ongoing collaboration with the Government of the Republic of Zambia (GRZ) and its ministries. Our longevity and success are in great part attributed to our deep relationships with leading local and international universities, foundations, and partner organizations. CIDRZ ensures that the latest research methodologies are used to answer locally relevant questions to improve healthcare delivery. CIDRZ also supports fellowship programmes for Zambian scientists and researchers focused on building the knowledge and skills needed to drive evidence generation to support health policy development.

Over the past two decades, our focus areas have evolved organically, shifting from primarily an HIV (Human Immunodeficiency Virus) focus to encompass other infectious diseases such as enteric pathogens, which contribute significantly to morbidity and mortality particularly for children and the immunocompromised. At CIDRZ, we aim to serve diverse populations that are most vulnerable to illness or poor outcomes. We use our skills in social and behavioural change, health systems improvement, laboratory work, and supply chain management to enhance the delivery of health services. As we look ahead, we plan to expand our efforts to anticipate and tackle new global health threats, with a focus on monitoring Antimicrobial Resistance, fortifying our lab capabilities, and expanding our vaccine portfolio.

Board Chair and CEO Note

Bradford Machila
Board Chairman

Izukanji Sikazwe
Chief Executive Officer

Welcome to CIDRZ's annual report for the 2023 Financial Year (FY23). CIDRZ had an exciting and productive year with over 1,400 employees managing 103 grants!

The growth in the scope and number of projects over the past year demonstrates our unwavering commitment to advancing healthcare and making a tangible difference in the lives of those we serve. As CIDRZ, we commit to working diligently and with the highest ethics and values to deliver high-quality services that create measurable impact.

CIDRZ continued to support the government through ongoing technical assistance (TA) to build capacity and strengthen health systems. Through the GAVI Partnership Engagement Framework, our Health System Strengthening (HSS) team provided TA to the MOH to support the Measles Rubella, and polio vaccination campaigns. Our TA also focused on extending immunisation services to reach zero-dose children and missed communities. We integrated the delivery of services, improved stock management for vaccines and devices to avoid facility-level stock-outs and strengthened the capacity of governance bodies.

In collaboration with the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) through the Centers for Disease Control and Prevention (CDC) and the United States Agency for International Development (USAID), CIDRZ continues to implement significant programmes in addition to offering technical assistance to the Zambian Ministry of Health.

Through the CDC and MOH, CIDRZ developed and deployed a case-based surveillance (CBS) system that has successfully compiled health records across 1,789 individual healthcare facilities nationwide, this includes data for hard-to-reach populations. The CBS system is dynamic and adaptable and has since been harmonized with the Recent HIV infection surveillance (Recency) programme conducted at point-of-care. CIDRZ collaborated with the MOH and various stakeholders to utilize and interpret recency surveillance data, with the MOH striving to enhance HIV service delivery in identified recency hotspot facilities and communities. This initiative aims to mitigate active HIV transmission and contribute to epidemic control efforts.

The CIDRZ Laboratory Innovation for Excellence (LIfE) project ended in 2023. This award helped scale laboratory services and provided high-quality HIV diagnosis, care, and treatment, contributing to the country's efforts towards the attainment of the 95-95-95 targets to end AIDS by 2030. This project accelerated the use of HIV Viral Load (VL) testing and early infant diagnosis (EID) in clinical care. We facilitated the transition from paper to digital data capture and result return systems in all districts across four provinces.

The USAID-supported Empowered Children and Adolescent Program III (ECAP III) continued to mitigate the impact of HIV and improve the health and well-being of Vulnerable Children. The project supported 128 health facilities across seven districts in Eastern and Lusaka Provinces, with case finding, treatment retention, and VL monitoring among all Children and Adolescents Living with HIV. The USAID

TBLON project received additional funding to support the procurement of equipment and rollout of SmartCare in 10 provinces in the country. We also trained 700 staff and transitioned 100 facilities to SmartCare for TB.

CIDRZ recognizes the importance of vaccine development and continues its partnerships with the international community through the implementation of clinical network trials. During the reporting period, we partnered with the European and Developing Countries Clinical Trials Partnership (EDCTP) to evaluate subcutaneous monoclonal antibodies' prolonged safety and tolerability in HIV-negative women. This assessment aimed to gauge extended safety measures and estimate efficacy in preventing HIV infection among young women. We also worked with the National Institute of Health (NIH) on a COVPN 3008 study to answer various COVID-19 vaccine-related questions. We also joined the USAID BRILLIANT Consortium, which seeks to develop HIV Vaccine work in Africa further.

Our Enteric diseases team continued research on Rotavirus infections that cause severe diarrhoea and are responsible for over 130,000 child deaths yearly in the developing world. Through the Shigoravax Project, we provided capacity building and technological support to Groupe de Recherche Action and Sant GRAS, based in Burkina Faso, for their surveillance study on shigella.

Equally important is our social and behavioural health sciences research work and studies over the past year. Two examples include the Hygiene Behaviour Change Lab, which aims to specifically address hand and food hygiene behaviours, supported by the London School of Hygiene and Tropical Medicine, and vaccine hesitancy, sponsored by Johnson & Johnson Scotland, to understand perceptions of the COVID-19 vaccine. This work will inform strategies and policies for future community vaccine rollouts.

Additionally, we are proud of our collaboration with the MOH and Ministry of Education in the fight against TB. Through this partnership, CIDRZs TBLON project supported countrywide inter-high school debates on TB awareness, culminating on World TB Day. Our TB team is also working with new collaborators, the EPSRC Impact Acceleration Account (IAA) and Higher Education Innovation Fund (HEIF), on using Artificial Intelligence (AI) to provide cough sound analysis. This activity is in conjunction with other work we have done with partners to increase access to high-quality TB diagnostics by expanding the availability of digital X-ray and computer-aided detection software.

With the passion that drives our teams, we are confident that CIDRZ will continue to deliver and pursue our vision of a Zambia where all people have access to quality healthcare and enjoy the best possible health.

> ***"We are confident that CIDRZ will continue to deliver and pursue our vision of a Zambia where everyone has access to quality healthcare and enjoys the best possible health."***

CIDRZ's 2023 Annual Report showcases our unwavering commitment to collaboration, innovation, and a healthier future for Zambia and beyond.

Board of Directors

Bradford Machila

Board Chair
Senior Special Assistant to the President of the Republic of Zambia. Member of the Law Association Zambia and the International Bar Association.

Kondwa E. Sakala-Chibiya

Deputy Board Chair
Lawyer and advocate of the High Court and Supreme Court of Zambia and Managing Partner of J.B. Sakala Legal Practitioners. Founding member and vice President of the Female Lawyers Association of Zambia and a member of the Institute of Directors.

Dr. Barbara Castelnuovo

Head of Research at the Infectious Disease Institute (IDI) and College of Health Sciences, Makerere University in Uganda.

Beatrice Grillo

Managing Partner of Grill and Gadersen Chartered Accounting firm. ACCA and ZICA fellow with over 40 years experience in Economics and Financial Management.

Dr. Charles Holmes

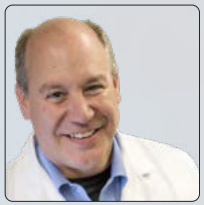
Co-Director of the Georgetown Center for Innovation in Global Health. Medical Doctor and Associate Professor with more than 25 years experience in research, clinical medicine, and infectious diseases.

Charles Mpundu

A Fellow of the Institute of Directors, who has over 30 years of experience in actuarial consultancy, pension fund administration, and leadership roles. Currently serving as Chairperson for the Zambia Statistics Agency and a Board member at Mopani Copper Mines.

Christopher Mubemba

Engineer registered with the Engineering Institute of Zambia, with 30 years experience working in the energy sector.



Prof. Michael Saag

Associate Dean for Global Health Director, UAB Center for AIDS Research. Professor of Medicine with over 34 years of professional experience in Infectious Diseases, Virology and Molecular Biology.

Patrick Wanjelani

Board Chairperson of the Zambia National Commercial Bank. ACCA and ZICA fellow with over 30 years of practical experience in Banking, Finance, Audit, and Risk Management

Executive Committee

Dr. Izukanji Sikazwe
Chief Executive Officer

Nana Appiah Qua-Enoo
Deputy Chief Executive Officer

Ackim Sinkala
Chief Financial Officer

Dr. Carolyn Bolton-Moore
Chief Medical Officer

Ronald Sinkala
Company Secretary

Mwansa Lombe
Human Resource Director

Leadership Team

Dr. Michael Herce
Dir. Implementation Science

Emmanuel Lumbwe
Dir. Internal Audit

Dr. Mwangelwa Mubiana Mbewe
Dir. Child and Adolescent Health

Dr. Monde Muyoyeta
Dir. Tuberculosis

Dr. Mwanza Wa Mwanza
Dir. Clinical Care

David Ojok
Dir. Central Laboratory

Cheryl Rudd
Dir. Primary Care and Health Systems Strengthening

Dr. Theodora Savory
Dir. Monitoring and Evaluation/ COP ACHIEVE & PROUD-Z

Michelo Simuyandi
Dir. Enteric Disease Vaccine and Research Unit

Mukwenya Banda
Dir. Information, Communication and Technology

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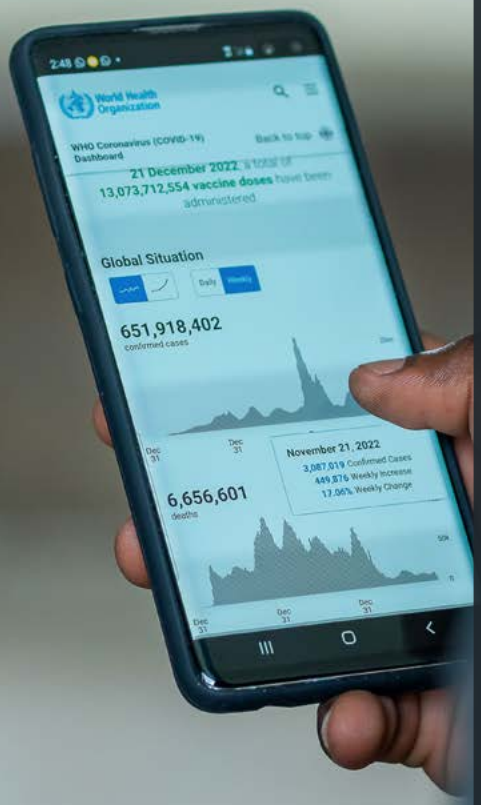
LARGE OR CROSS-CUTTING PROJECTS

- USAID Controlling HIV Epidemic for Key and Underserved Populations I
- USAID Empowered Children & Adolescents Program III
- Provincial Ownership to Uplift Delivery of HIV Services in Zambia
  - Adult Care and Treatment
  - ANC Covid Surveillance: Assessing SARS-CoV-2 Seroprevalence during Routine Antenatal Care Visits in Zambia
  - Case-Based Surveillance
  - Cervical Cancer
  - Data Modernization Initiative
  - Elimination of Mother to Child Transmission
  - Infection Prevention Control
  - Key Population Investment Fund
  - Mental Health Services for PLHIV
  - MORE-ZM DHIS2
  - Paediatrics
  - Recent Infection Surveillance
  - Smart Care Support
  - Support to the Zambia National Public Health Institute, the National Livestock Epidemiology and Information Centre, and the University Teaching Hospitals
  - Telemedicine
  - Voluntary Male Medical Circumcision
- USAID Tuberculosis Local Organisations Network
- USAID Zambia Integrated Health



USAID Controlling HIV Epidemic for Key and Underserved Populations I

Funder:
United States Agency for International Development

Time Period:
Oct 2021 - Oct 2026

USAID Controlling HIV Epidemic for Key and Underserved Populations I (USAID CHEKUP I) is led by CIDRZ in partnership with the Young Women Christian Association (YWCA), Pact, Inc., Copper Rose Zambia, and four Key Populations Civil Society Organizations (KP CSOs). USAID CHEKUP I is implemented in nine districts of Zambia- Livingstone, Lusaka, Ndola, Kitwe, Luanshya, Chingola, Mufulira, Chililabombwe, and Solwezi. The goal of USAID CHEKUP I is to improve the health outcomes of Zambians by preventing new infections among priority and key populations.

Significant progress was made in achieving strategic objectives during the reporting period. Efforts were directed toward identifying and reaching individuals at high risk of HIV infection with targeted prevention services. A total of 202,220 priority populations, including mobile groups, men aged 25-34 years, and discordant couples, were provided with essential HIV prevention interventions. Additionally, a substantial quantity of condoms and lubricants, totaling 588,866 and 79,641 respectively, were distributed to promote safer sexual practices.

Outreach efforts extended to 17,757 KPs, while specific programmes, such as DREAMS, enrolled 115,333 adolescent girls and young women. Furthermore, initiatives like Coaching Boys into Men (CBIM) targeted 8,118 adolescent boys to address harmful notions of masculinity perpetuating gender-based violence. Notably, a significant number of individuals, amounting to 8,484, were initiated on PrEP within DREAMS and KPs wellness centers, enhancing HIV prevention efforts. Additionally, various support mechanisms were provided to empower AGYW, including education, financial literacy training, vocational skills development, and awareness programmes on social asset building and sexual harassment.

Digital literacy training and opportunities for internships and employment further bolstered their prospects. Moreover, family planning services were extended to 26,906 young women, contributing to comprehensive reproductive health support. Targeted testing strategies identified 5,636 HIV-positive individuals out of 47,702 tested, with the distribution of 30,763 self-test kits.

USAID CHEKUP I, continued to leverage existing community structures - Ward Development Committees (WDC), Neighbourhood Health Committees (NHC), churches, and government and community schools - to deliver HIV prevention services. Nineteen project staff across these community structures were trained as Trainers for Community Change Agents and Peer Educators. This aimed to improve the knowledge base of key community members with community mobilisation and sensitisation, provide targeted, evidence-based HIV prevention services in line with USAID Zambia's Local Partner Transition Strategy.

We have focused on enhancing the capacity of local implementing partners to deliver targeted, evidence-based HIV prevention services aligned with USAID Zambia's Local Partner Transition Strategy. During the reporting period, 35 project staff underwent training to optimize the implementation of the CBIM programme, with an additional 20 trained TOTs for Change Agents and Peer Education. Furthermore, four KP CSOs – Tithandidzeni Umoyo Network Limited (TUNL), Key Population Alliance of Zambia (KPAZ), Lotus Identity (TLI), and SHADE – were designated to spearhead the implementation of KP activities.

However, several challenges were encountered, including the erratic supply of HIVST kits, which hindered activities, inadequate laboratory reagents for clinical monitoring of both KP and adolescent girls and young women (AGYW) on PrEP, and a limited supply of condoms. These challenges underscore the need for ongoing support and resource allocation to strengthen the delivery of HIV prevention services by local partners. Since USAID CHEKUP I received supplies through government health facilities, any occurrence of limited stocks at government facilities subsequently resulted in rationing of supplies to partners.

USAID Empowered Children & Adolescents Program III

Funder:
United States Agency for International Development

Time Period:
Sep 2020 - Sep 2025

Empowered Children and Adolescent Program III (ECAP III) aims to mitigate the impact of HIV and improve the health and well-being of Vulnerable Children and Adolescents (VCA) through the delivery of high-impact, evidence-informed, and age-appropriate interventions customised for each VCA sub-population using a family-centred approach. The project seeks to improve the social and health outcomes of vulnerable households in HIV-burdened districts.

At the close of FY2023, ECAP III supported 128 health facilities across seven districts in Eastern and Lusaka Provinces, with routine service provision, including case finding, treatment retention, and VL monitoring among all Children and Adolescent Living with HIV (C/ALHIV). Both enrolled VCA and caregivers received services at the community level under the schooled, stable, and safe domains. As caseworkers, frontline workers ensured that VCAs' and caregivers' case plans were updated given the services offered.

Cumulatively, USAID ECAP III served a total of 87,343 beneficiaries through PEPFAR OVC programs for children and families affected by HIV, representing 104% achievement against the annual target. Disaggregated by the OVC programme model, a total of 77,321 beneficiaries were reached through the comprehensive programme (102% against the annual target), while 10,022 beneficiaries successfully completed the sessions under the HIV preventive model (118% achievement against the annual target). Of the total VCAs enrolled under the comprehensive programme, 8,913 VCAs received school support in the form of books, shoes, school uniforms, and fees, representing 89% of the annual target.

During the reporting period, CCWs were equipped with the skills necessary to create child safety plans, addressing the urgent needs and protection risks of children who were subjected to violence and neglect as they were at higher risk of abuse or sexual violence. To improve the financial capacity of enrolled households, the project continued to provide TA to more than 300 savings groups. To increase the proportion of VCAs with known HIV status, the programme continued conducting HIV risk assessments among those enrolled. This resulted in 99% proxy known HIV status, with slightly above 10,000 reporting HIV positive. Of the HIV-positive VCAs, 88% were eligible for VL, and 87% had VL results documented in the patient file in the previous 12 months. Of the CALHIV with documented VL results, 97% were virally suppressed.

Provincial Ownership to Uplift Delivery of HIV Services in Zambia

Funder:

The Center for Disease Control and Prevention

CIDRZ is a technical assistance partner, with funding by CDC/PEPFAR, to Lusaka Provincial Health Office as well as the Ministry of Health under the Provincial Ownership to Uplift Delivery of HIV Services in Zambia (PROUD-Z) award. In line with the goals of PEPFAR, CIDRZ continues to aim to 1) accomplish and sustain the mission of epidemic control, by special focus on the specific gaps identified in Zambia 2) build enduring capabilities through continued need-based capacity building of Ministry of Health (MoH) staff at all levels, and 3) build lasting collaborations with MoH colleagues, Community and other Implementing Partners (IPs) to ensure harmonized, strategic, data-based activities. During the year under review CIDRZ provided special focus to the Infant, Paediatric and Adolescent Case Finding and retention gap, to Key and Priority Populations, with special attention to prevention activities and to the retention gap in adults.

Surveillance work was harmonized and automated with a focus on analysis and data use. CIDRZ continues to actively participate through innovations in the harmonization of data sources, the improvement of the Electronic Health Record system SmartCare, and the data modernization efforts.

Adult Care and Treatment

CIDRZ has continued to provide TA to the LPHO to enhance HIV testing efficiency using HIV risk screening tool, index testing, and social network testing amongst adolescents and young people. During the reporting period, CIDRZ developed the capacity of testers in proficiency testing, ensuring quality control measures are in place in supported sites and improving the quality of counselling skills.

CIDRZ continues to pioneer innovative approaches such as the status neutral approach, linking high-risk HIV negatives to prevention (PrEP), improving the linkage of HIV positives to treatment, and maintaining individuals in care. We have developed tools and supported a pilot with the LPHO that has informed practice in other parts of the country. Along with provincial mentors, CIDRZ has introduced social network testing for adolescents with a possibility for a national implementation. We continue to build the capacity of healthcare workers, lay providers, and faith-based organisations in combination with prevention interventions. CIDRZ, along with the MOH and other prevention partners, will participate in the introduction of novel prevention options, such as injectable PrEP.

To improve adult care and treatment, CIDRZ collaboratively worked with the PHO to provide TA in closing the current gaps identified in the treatment cascade. This support covered all seven districts of Lusaka Province, targeting staff at the MOH, PHO, DHO, and facility levels. Major focus areas included adolescent care and helping LPHO achieve targets such as Tx curr 307,427/322,138 (95.4%), VL coverage (90%), and suppression (98%). CIDRZ supported the rollout of the 2022 Zambia consolidated guidelines for treatment care and prevention.

CIDRZ TA supported the LPHO community team in implementing a retention package and reducing treatment interruption. This included on-site orientations and one-on-one mentorships on the proactive RoC appointments and tracking systems.

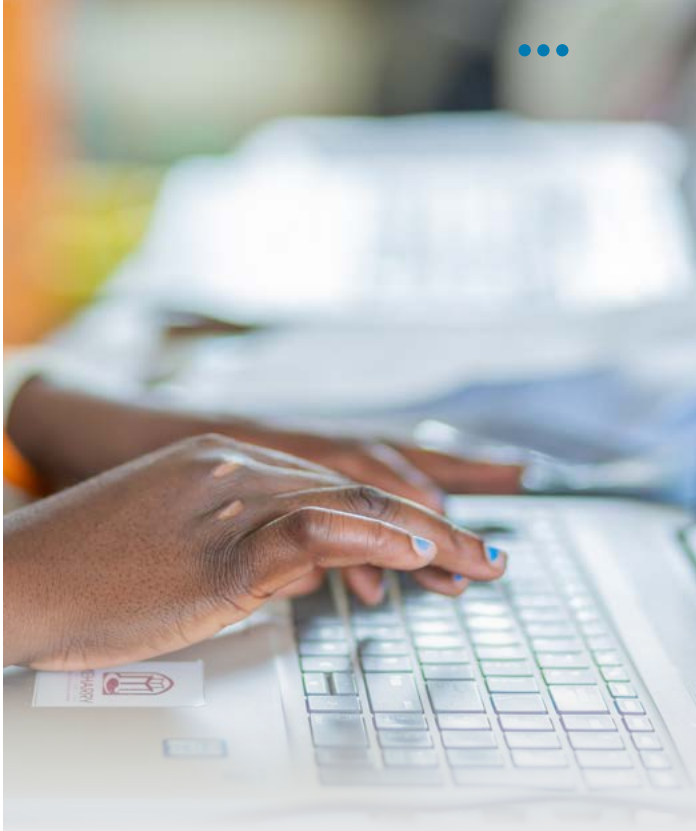
Routine capacity-building activities of medical and clinical officers, nurses, pharmacy, laboratory staff, and treatment supporters took place across all supported sub-districts and districts with a total of 2,448 one-on-one mentorships in various indicators conducted to improve facilities' performance.

Key to mention is that CIDRZ supported training in HIV/AIDS management (442 staff), Advanced HIV Disease (AHD) (234 staff), quality improvement (189 staff), and PCC (204 staff). To enhance understanding of PEPFAR MER indicators, CIDRZ also supported the LPHO by conducting indicator training (108 staff; 252 community health workers). Finally, CIDRZ supported LPHO in reviewing and updating all existing standard operating procedures (SOPs) to improve service delivery.

ANC Covid Surveillance: Assessing SARS-CoV-2 Seroprevalence during Routine Antenatal Care Visits in Zambia

This study proposed investigating the extent of SARS-CoV-2 infection, as determined by seropositivity, among 9,600 pregnant women attending their first ANC visit as a proxy for prevalence in the general population. The study was implemented in 40 health facilities in Chadiza, Chipata, Chongwe, and Lusaka districts. This project aimed to provide information on the seroprevalence of SARS-CoV-2 antibodies in the community with pregnant women as the sentinel population.

Using pregnant women to assess COVID-19 seroprevalence, vaccination uptake, and hesitancy is acceptable and feasible and may provide an easy, sustainable platform for routinely monitoring COVID-19 and other disease outbreaks. Most women attending ANC visits had evidence of prior SARS-CoV-2 infection, suggesting widespread transmission in Zambia. ANC clinics have a potential role in ongoing SARS-CoV-2 sero-surveillance and can continue to provide insights into SARS-CoV-2 infection and immune system dynamics. Key vaccination messages and mass vaccination strategies can be designed and adopted for minority groups to reduce hesitancy and increase uptake. COVID-19 vaccination might be incorporated into routine ANC to help increase coverage.



CIDRZ utilized the DHIS2 platform to enhance animal health surveillance (AHS) and developed a digital AHS system with features like an electronic outbreak form to promptly alert about disease outbreaks.

Case-Based Surveillance

The Case-Based Surveillance (CBS) system developed by CIDRZ has successfully compiled records across all facilities connected to the latest version of the EHR across all ten provinces in Zambia. It also enables the deduplication of RoC, providing more accurate estimates of those in care and, conversely, estimates of those previously in care and lost to follow-up (LTFU). Among the many CBS activities, a highlight is the successful co-creation of an epidemic indicator dashboard that provides visuals of revised estimates for those in care, the proportion of RoC that are virally suppressed, and linkage to care by facility, district, and province. This collaboration, led by CIDRZ, included the CDC and the MOH

Cervical Cancer

The CIDRZ cervical cancer prevention programme supported the MOH in implementing quality cervical cancer prevention services focusing on Lusaka and Eastern Provinces. This service concentrated on women living with HIV (WLHIV) in all HIV care and treatment service points. We provided TA to 47 established Visual Inspection with Acetic acid (VIA) screening and 15 Loop Electro-surgical Excision Procedure (LEEP) centres in Lusaka province and 52 VIA and 12 LEEP centres from Eastern province. We further collaborated in supporting all ART centres in Lusaka province (250) with outreach screening and self-collection of HPV tests.

CIDRZ trained 40 VIA, 10 LEEP providers, and 20 CBVs in the province to mitigate staff attrition and enhance client mobilization. Additionally, 160 HCWs from all ART facilities were trained in HPV self-collection to improve the uptake of eligible women being screened for cervical cancer.

During the reporting period, the programme managed to screen 56,345 from a target of 51,181 (110%) in Lusaka province, where 2,549 were VIA positive and 2,327 received treatment (91%treatment rate), while in Eastern province, 22,656 women were screened from a target of 21,187 (107%). Of these, 569 were VIA positive, and 418 were treated (treatment rate of 74%).

Data Modernization Initiative

In July 2022, CIDRZ received funding to implement the American Rescue Plan Act (ARPA) Data Modernization Initiative. During 2023, CIDRZ facilitated the creation of the Zambia Health Informatics Competency Framework and handed it over to the Higher Education Authority (HEA). Any college or university wishing to introduce an academic programme in health informatics must reference this framework.

CIDRZ, in collaboration with the MOH and the Smart Zambia Institute, has overseen the creation of a preliminary data governance framework in the health sector. This will enable a comprehensive data storage and sharing policy, building upon the groundwork laid by the GRZ given the establishment of the Data Protection Act, the Cyber Security and Cyber Crimes Act, and the National Health Research Act.

Elimination of Mother to Child Transmission

CIDRZ is providing TA on the elimination of Mother to Child Transmission (eMTCT) to the LPHO to support 193 sites in six districts, including two rural districts with hard-to-access communities due to poor road network. CIDRZ mentored 600 HCPs and 800 mentor mothers/treatment supporters on a comprehensive eMTCT package that included VL monitoring and cohort monitoring and ensured tracking systems were established. We equipped 207

HCPs from all supported districts with knowledge of cohort monitoring who attended a three-day training that included intense practical sessions on documentation and reporting.

Of the HIV HIV-exposed infants, 93% received an Early Infant Diagnosis (EID) before two months of age. CIDRZ and LPHO are strengthening the appointment system to test clients at the correct point in time. Due to poor documentation, 86% of the HIV-exposed infants had a documented status outcome at 24 months. Intense onsite mentorship is provided on cohort monitoring.

Infection Prevention Control

Under clinical care, CIDRZ supported the Lusaka Provincial Health Office (LPHO) and Southern Provincial Health Office (SPHO) in the implementation of an infection prevention and control healthcare package aimed at reducing the spread of COVID-19 and other infectious diseases in healthcare settings. One hundred and four health facilities in Lusaka and southern provinces were supported by CIDRZ to comprehensively enhance IPC activities and increase safety amongst healthcare workers and the community.

In addition, CIDRZ worked with the MOH and WHO to develop and finalise the IPC national framework from 2022 to 2026 and revised IPC guidelines that include surveillance of health-acquired infections and antimicrobial surveillance.

Key Population Investment Fund

The overall aim of the Key Population Investment Fund (KPIF) programme under CIDRZ is to support KP HIV programming in Zambia. We work in partnership with the MOH and local facilities to build the capacity of KP civil society organisations. Together, we seek to deliver valued and interlinking prevention, care, and treatment services to female sex workers, men who have sex with men, transgender people, people who inject drugs, and incarcerated people in Chilanga, Chongwe, Kafue, and Lusaka districts.

From October 2022 to September 2023, the CIDRZ KPIF program continued to use the social network strategy (SNS) and outreach activities to reach KPs with HIV testing, treatment, prevention, and care services. During this period, a total of 18,292 KPs were reached with prevention messages; 10,990 were tested for HIV, of which 3,207 (29%) tested positive and were linked to ART, while 7,783 tested HIV negative. Out of the 7,783 KPs who tested HIV negative, a total of 7,673 (99%) were initiated on PrEP.

In addition, all the KPs who visited the safe space were screened for STIs, of those, 3,197 were tested, 925 (29%) tested positive, and 818 (88%) were treated. A total of 950,375 condoms and 743,115 lubricants were distributed.

Mental Health Services for PLHIV

CIDRZ has continued to work closely with the MOH through PHOs to implement the Common Element Treatment Approach (CETA) in Lusaka, Western, Southern, and Eastern provinces. The objective of this collaboration is to provide holistic services to Recipients of Care (RoC) who may have multiple co-morbid conditions, including mental health disorders that negatively impact their engagement with ART services. Conditions treated with CETA are depression, alcohol, and other substance abuse. During 2023, a total of 913 clients completed CETA, with 219 receiving active treatment in the 39 CETA implementing facilities in the four Provinces. After CETA, clients show an average improvement of 95% in the Clinical Monitoring Form (CMF) Mental Health scores.

To enhance implementation of the CETA, CIDRZ provided technical supportive supervision (TSS) to 39 sites in Southern, Western, Lusaka, and Eastern provinces, and weekly routine clinical supervision to improve clinical outcomes for clients enrolled in CETA care. Weekly practice groups were conducted to enhance the quality of counselling offered. In collaboration with the MOH and Zambia National Public Health Institute (ZNPHI), we conducted a first-of-its-kind Psychological First Aid training for CIDRZ and DAPP staff. Additionally, CIDRZ is participating in developing a Zambia national mental health training package.

MORE-ZM DHIS2

CIDRZ supported the implementation of the MORE-ZM DHIS2 system for use by CDC Implementation Partners in FY23. Changes were made to the system's computerized data entry forms for various indicators, including adding the 50+ age band disaggregation to all treatment-related metrics. To enhance data quality, all related components of these indicator enhancements, including data validation rules and subtotals, were effectively integrated into the system. Sungani Bana and Mental Health (CETA) indicators have also been added to the monthly PEPFAR MER dataset.

The project engaged with partners to develop and implement spatial GIS data mapping for various indicators to improve disease surveillance. They also successfully deployed the MORE ZM data analytics tool using Power BI with an easy-to-read interactive performance dashboard. Several trainings were conducted for both clinical and strategic information (SI) staff in the Southern Provincial Health Office (SPHO) and Western Provincial Health Office (WPHO).

Paediatrics

CIDRZ supported the Lusaka Provincial Health Office (LPHO) with TA to improve performance across the whole HIV cascade from testing through linkage to treatment, viral suppression, and retention in care. While finding new HIV-infected children was challenging, we supported and rolled out family index testing or Know Your Child's HIV Status (KYCHS), where all children born from HIV-positive women are offered HIV testing and linked to treatment if positive.

This testing method resulted in the largest number of HIV-positive children compared to any other. CIDRZ supported the implementation of Directly Observed Therapy (DOT) and structured enhanced adherence counseling to improve viral suppression. CIDRZ provided clinical mentorship and TA on a routine basis to support the provision of quality paediatric HIV services. We trained 115 Health Care Workers (HCWs) in the paediatric HIV guidelines from Lusaka, Chongwe, Luangwa, Rufunsa, Chilanga, and Kafue districts.

CIDRZ conducted joint Technical Supportive Supervision (TSS) visits to the Youth Friendly Spaces (YFS) facility in all the supported districts to stimulate activities and build capacity in HCWs and support staff working in the YFSs. We trained nine adolescent peers to work as counselors, managing client interactions on the adolescent app My Safe Space. The app provides adolescents with access to information on HIV, reproductive health services, STIs, GBV, mental health issues, counseling, and linkage to professional help through their adolescent peers. We further oriented adolescents in the YFSs on app usage. My Safe Space also provides non-health-related services such as short online courses and job adverts. Beyond this, CIDRZ supported the refurbishment of nine YFSs.

Recent Infection Surveillance

A positive recent test indicates that the person was likely infected with HIV in the past 12 months. An important strategy adopted by the MOH is to monitor the incidence of HIV and identify sociodemographic factors or geographic locations associated with a high proportion of newly acquired infections. On behalf of the MOH, with support from implementing partners in Lusaka, Copperbelt, Central, and Southern provinces, CIDRZ oversaw the implementation of recent infection surveillance.

To strengthen the surveillance program, we aimed to increase recency uptake in all provinces to attain >80% coverage of eligible HIV-positive tested individuals and demonstrate recency data use. By the end of June 2023, 669 sites had been activated in 42 districts across six provinces. Towards the end of the reporting period, overall testing coverage was 84%, a notable increase from 75% at the start of the year.

Smart Care Support

The Strategic Information (SI) department, as a vital part of the ongoing SmartCare Health Information System (HIS) project, achieved significant milestones such as transitioning the PEPFAR MER report indicator definitions from version 2.6 to 2.6.1 and the implementation of Differentiated Service Delivery (DSD) reports during the fiscal year. We developed enhancements to reports, such as the PEPFAR MER, dedicated to monitoring specific performance indicators critical for informing HIV programming in Zambia. These reports addressed essential aspects of healthcare and were refined to seamlessly align with national HIV guidelines, ensuring compliance and effectiveness. Furthermore, we played a pivotal role in advancing research efforts by providing valuable data on HIV genotyping treatment interventions for paediatrics, PrEP appointments and retention, TB screening, case findings, notifications, and treatment outcomes from the EHR.

Support to the Zambia National Public Health Institute, the National Livestock Epidemiology and Information Centre, and the University Teaching Hospitals

During FY23, CIDRZ continued supporting key institutions such as the Zambia National Public Health Institute (ZNPHI), the National Livestock Epidemiology and Information Centre (NALEIC), and the University Teaching Hospitals (UTH), in their respective surveillance initiatives. These efforts encompassed three projects: the Electronic Integrated Disease Surveillance and Response System Tools (eIDSR), Animal Health Surveillance (AHS), and Influenza-like Illnesses and Severe Acute Respiratory Infections (ILI/SARI), all falling under the overarching ARPA cornerstone-funded projects. This holistic approach, aligned with the principles of One Health, seeks to optimize health outcomes for humans, animals, plants, and the shared environment.

Telemedicine

Following the diagnosis of the first case of SARS-Cov 2 infection in Zambia in March 2020, CIDRZ received funding from the U.S. CDC COVID-19 Response International Task Force to implement Differentiated Service Delivery (DSD) in TB services.

CIDRZ implemented remote patient monitoring through a differentiated service delivery model (DSD) that ensured patients continued to receive clinical monitoring and psychosocial support while minimizing contact with health facilities. Beginning in February 2022, we offered ATT via two-month MMD during the intensive phase and four-month MMD during the continuation phase to all eligible TB clients. TPT was offered to stable HIV clients for six months and was aligned with ARV dispensation.

In FY23, we enrolled 970/987 (97%) ATT RoCs and 2362/2415 (98%) TB TPT RoCs; these were followed up remotely for six months to determine treatment outcomes and monitored for any adverse effects or TB symptoms. The project was implemented in five health facilities in Lusaka and Livingstone districts.

Voluntary Male Medical Circumcision

CIDRZ supported the PHOs to increase voluntary medical male circumcision (VMMC) coverage in high-priority areas, with 90% of sites achieving VMMC targets and reaching 80% coverage among 15–29-year-olds. With CIDRZ support, in Western, Eastern, and Southern we achieved ourFY23 targets by August 2023, except for Lusaka PHO, which met 88% of their annual target. A total of 184,331 clients (90% from the key age group:15-29 years) were circumcised in WELS provinces, from a target of 140,250.

To enhance sustainability, ongoing capacity building in the ShangRing device method was provided to MC mentors who extend the knowledge to health facility-level staff. The MC Program, through CDC buffer funds, conducted technical support visits in each of the supported provinces, resulting in the establishment of eight Centres of Excellence across WELS provinces.

USAID Tuberculosis Local Organisations Network

Funder:
United States Agency for International Development

Time Period:
Mar 2020 - Mar 2025

The goal of USAID Tuberculosis Local Organisations Network (TBLON) is to support the prevention, care, and treatment of TB in Zambia. TBLON uses a health system strengthening approach aimed at reaching the most at-risk TB populations through increased demand for TB preventive, diagnostic, and treatment services; greater diagnostic yield; improved quality of diagnosis with a reduced proportion of clinically diagnosed TB patients, patient linkage to treatment and preventive services; and comprehensive patient management with improved treatment outcomes. The project uses a collaborative, adaptive, and learning approach to address bottlenecks in TB programming at various levels. Through this approach, the project has contributed to the gains made by the country in the fight to end TB by 2030.

In FY23, the TBLON geographical scope expanded from Lusaka and Southern provinces to include six additional provinces, including Northern, North-Western, Muchinga, Luapula, Copperbelt, and Central. Its content scope included strengthening TB case detection, strengthening programmatic management of DR-TB, and Improving an enabling environment for TB services through strengthening data management, Operational research, and PEPFAR TB/HIV activities.

Key highlights of the year include the identification of 391,239 presumptive cases, with 93% having a documented TB status and 88% undergoing evaluation using GeneXpert. Additionally, 44,709 cases were notified, with 98% successfully linked to treatment. The support extended to data management systems involved the rollout of SmartCare for TB to 101 facilities across all ten provinces. Moreover, 800 community-based volunteers were recruited to bolster activities. Capacity building efforts included training 732 staff in SmartCare, 218 in infection prevention and control (IPC), and over 500 in TB case management. Furthermore, support was provided for the review of TB case management guidelines, guidelines for tuberculosis preventive therapy (TPT), and HIV guidelines.

USAID Zambia Integrated Health

Funder:
United States Agency for International Development/PACT

Time Period:
Apr 2023 - Apr 2028

The USAID Zambia Integrated Health (USAID ZIH) project aimed to improve the health outcomes of Zambians through equitable access to high-quality, client-centred HIV, TB/HIV, MNCH, and family planning/reproductive health services, products, and information. These services, integrated, when possible, can reduce mortality, morbidity, and HIV transmission for populations in focus districts in Northwestern, Copperbelt, and Central provinces in Zambia.

The objectives of the USAID ZIH consortium include increasing coverage and utilization of comprehensive FP/RH/MNCH and HIV services, enhancing the capacities of health offices for sustained service delivery, and transitioning to integrated health services. During the reporting period, CIDRZ achieved various milestones such as hiring clinical teams, filling provincial positions, recruiting district-level staff, orienting staff, revising tools, developing supply plans, and conducting site assessments. The funding primarily supports Central and Northwestern Provinces, with plans to start implementation on the Copperbelt Province by the start of FY24.

CIDRZ, funded by CDC/PEPFAR, collaborates with the Lusaka Provincial Health Office and the Ministry of Health through the PROUD-Z award. Aligned with PEPFAR goals, CIDRZ focuses on achieving and sustaining epidemic control in Zambia by addressing specific gaps, conducting capacity building for MoH staff, and fostering collaborations with colleagues and partners.

02

ADULT HIV CARE, TREATMENT & PREVENTION

- Hepatitis B Functional Cure Mechanisms In HIV
- HIV Control Working Group
- International Epidemiology Databases to Evaluate AIDS
  - Adolescent & Youth Network
  - DTG Resistance
  - DTG Switch Study
  - Liver Fibrosis Study
  - Non-Communicable Diseases Study
  - SRN Sentinel Research Network
- Long-Term Technical Service Providers of The Global Fund HIV Differentiated Service Delivery Strategic Initiative
- Voluntary Medical Male Circumcision NEXUS Study

Hepatitis B Functional Cure Mechanisms In HIV

Funder:
National Institute of Health

Time Period:
Jul 2019 - Apr 2024

CIDRZ and its collaborators have documented that a hepatitis B functional cure may occur because of immune responses to antiretroviral therapy in people with HIV/HBV coinfection, a common clinical scenario in Zambia. This may have a global impact as there is currently a race to develop new cure drugs for hepatitis. In this study, the team is using blood and liver samples to understand how the unique immune response works. So far, 160 individuals have enrolled, and data was disseminated locally, at international conferences, and in top infectious diseases journals.

HIV Control Working Group

Funder:
Bill & Melinda Gates Foundation

Time Period:
Nov 2022 - Nov 2024

The HIV response for Sub-Saharan Africa (SSA) has largely been led by international experts and multilateral agencies based in the global north, with the agenda and finances for the response drawn from organisations not based in SSA. Now more than ever, there is a need for greater engagement in the HIV response that is informed by African experts to consolidate the gains to date and propose innovative and locally relevant solutions to mitigate the gaps in ending HIV as a health threat on the continent.

The investment by the Bill & Melinda Gates Foundation (BMGF) supports the establishment of an HIV control working group (HCWG) comprised of stakeholders from African countries. This group seeks to develop consensus among African leaders on the definition of long-term sustained "control of HIV" and "ending AIDS as a public health threat" and identify prioritised systems and capabilities required for achieving and sustaining this.

The goal of the HCWG is to offer recommendations to HIV and health funders, multilateral health agencies, African governments, and implementing partners for investing in the identified systems and capabilities to achieve and sustain HIV control as defined through consensus building based on African experts' perspectives.

The project secretariat is hosted by CIDRZ, membership is by invitation and has been extended to African leaders from diverse backgrounds who have contributed significantly to, and shaped, the public health agenda on the African continent. Their unique experiences, expertise, and leadership drive the formation of a unique voice that contributes to the existing efforts for Africans to lead their own health agenda.

The HCWG is expected to work collaboratively to develop a framework for sustained HIV control, to facilitate and support country/region-specific dialogue to strengthen country ownership, accountability, and sustainability of HIV programmes; to generate a common understanding of what HIV "control" / "ending" HIV means in SSA, given the disproportional burden of HIV incidence in sub-populations and geolocations; to underscore the importance of prevention strategies and reprioritise based on country/regional context, sub-populations, patient outcomes vs coverage; to advocate for faster realisation of universal health coverage and defining pathways for integration of health services while strengthening access to quality HIV services; and to leverage COVID-19 experiences to get multiple stakeholders to focus on strengthening health systems and integration while utilising innovation to benefit the provision of HIV services.

International Epidemiology Databases to Evaluate AIDS

Funder:
National Institute of Health, University of Bern

The International epidemiology Databases to Evaluate AIDS (IeDEA) collects observational data representing over 2.2 million people living with and at risk for HIV, contributed by clinical centers and research groups in 44 countries. CIDRZ is a long standing contributor to the IeDEA databases.

IeDEA conducts both regional and global research. CIDRZ investigators use and participate in the IeDEA platform to share their multidisciplinary expertise and answer high-priority research questions. These include evaluating the HIV treatment cascade, co-infections like tuberculosis and hepatitis, cancers, and non-communicable diseases, including mental health and substance use disorders.

Adolescent & Youth Network

This is a prospective study dedicated to investigating how care transitions, key comorbidities and conditions, mental health challenges, and social-environmental factors impact the outcome of ART adherence, viral suppression, care, and mortality among adolescents living with HIV (ALWH). This study is being implemented at CIDRZ Kalingalinga Central Lab, has enrolled 50 participants, and is currently conducting follow-up visits.

DTG Resistance

This is a cross-sectional, non-interventional study open to adults who are 18 years and older and adolescents between the ages of 10 and 17. Participants must present with virologic failure on DTG-based ART at clinical sites within six regions of the IeDEA cohort.

The study aims to compare the prevalence of integrase strand-transfer inhibitors (InSTI) drug-resistant mutations in adults and adolescents on DTG-based ART regimens at the time of virologic failure between HIV-1 subtypes and treatment contexts. The project is being conducted in four sites: University Teaching Hospital (UTH), CIDRZ Kalingalinga Central Lab, Matero General Hospital, and Kanyama General Hospital, with an enrollment target of 250.

DTG Switch Study

The goal of the study was to recruit and characterise the short- and long-term outcomes of first-line switch to dolutegravir (DTG)-based ART in representative populations. The study assessed the incidence of virologic failure and the contribution of drug resistance to virologic failure after the switch. Beyond this, the study determined the incidence of neuropsychiatric, metabolic, and other side effects of dolutegravir-based ART when it is associated with Tenofovir Alafenamide (TAF) or Tenofovir Disoproxil Fumarate (TDF) in African patients who have not yet been fully addressed. The study was conducted in three sites: Kalingalinga Central Lab, Kanyama, and Matero General Hospitals, and 1,410 participants were enrolled. Study activities were completed by 31st December 2022, and now the team is focused on data analysis and dissemination of findings. The first analysis showed that the Viremia was uncommon two years after the programmatic switch to DTG-based first-line ART, and only two cases of emergent DTG drug resistance were detected. Still, PLHIV switching to DTG with viremia had a substantially higher risk of viremia at 2 years than PLHIV with viral suppression at switch. The Zambian policy of only switching virologically suppressed patients may have reduced the risk of developing viremia and virologic failure on DTG.

Liver Fibrosis Study

Around 8% of PLHIV in Zambia also have active Hepatitis B infection, which puts them at risk for liver damage and cancer. The goal of this study is to determine the prevalence of significant levels of liver fibrosis in co-infected HIV-HBV patients in Zambia using non-invasive methods to identify the predictors of significant fibrosis and liver cancer. The project aims to assess the impact of ART on the progression of liver fibrosis and incidence of liver cancer and to determine the rate of predictors of HBsAg sero-clearance (called 'HBV functional cure') in ART-treated HIV-HBV. The study is being conducted at Kanyama General Hospital, with 154 active participants from the 200 enrolled. The study is piloting liver cancer screening with blood tests, ultrasound, and CT scans and is evaluating new biomarkers. So far, no cases of liver cancer have been found during ART – which is very exciting as liver cancer is not curable in Zambia and even in upper-income countries has a poor prognosis. Data from the study will be published in a top infectious diseases journal.

Non-Communicable Diseases Study

ART for HIV-infected adults has expanded significantly in the last decade, PLHIV have improved life expectancy but are confronted with cardiovascular diseases (CVD) and metabolic complications in resource-limited settings.

This project addresses a global public health priority and aims to understand and evaluate the long-term outcomes of PLHIV to determine the prevalence and incidence of NCDs such as metabolic diseases, cancer, and mental illness, and the impact of substance abuse on HIV outcomes. The study is being conducted at Kalingalinga and Matero first-level Hospitals, with 470 active participants from the 500 enrolled. The output from this program of work will be translated into improved prevention and treatment programs for HIV across the world.

Preliminary results of aim 4 showed the presence of multimorbidity with a prevalence among adults living with and without HIV close to 20% in participants >=40 years, and Multimorbidity was more frequent among women and more driven by obesity. Our results underline the urgent need for adapted strategies to integrate screening for comorbidities in primary care settings in southern Africa.

SRN Sentinel Research Network

The Sentinel Research Network for IeDEA (SRN) Study is a five-year, multi-regional project. It is a prospective study dedicated to exploring the epidemiology of NCDs and risk factors among HIV-infected adult patients 40 years and older from the general population in Southern Africa. The project's main objective is to establish a network of research sites dedicated to capturing and analysing standardised data among several low- and middle-income countries (LMICs). Studies being implemented through this network are focusing on cardiovascular disease, mental health, alcohol and substance use disorders, and liver diseases. In Zambia, the study is being conducted at CIDRZ Kalingalinga Central Laboratory. The study is currently in the follow-up phase, and all year-two visits to measure lipid profile and test liver and kidney function and diabetes were conducted on all actively enrolled participants during the reporting period. Data analysis is currently being done.

Long-Term Technical Service Providers of The Global Fund HIV Differentiated Service Delivery Strategic Initiative

Funder:
The Global Fund to Fight AIDS, Tuberculosis and Malaria

Time Period:
Jun 2021 - Dec 2023

The HIV differentiated service delivery (DSD) strategic initiative (SI) aims to provide technical assistance (TA) to address gaps in testing and treatment for key populations, men, adolescents, and children. The role of the initiative was to provide expert technical assistance to the Zambian HIV program (for policy and programming implementation) to ensure DSD models, adaptations and/or innovations are developed and scaled in order to improve the efficiency and quality of services ultimately reducing morbidity and mortality and community transmission of HIV through early diagnosis, high treatment coverage, treatment retention and viral load suppression.

Through providing expertise to drive innovation and adaptations in service delivery necessary to close treatment gaps and deliver the team was able to support the MOH scale-up HIV testing and treatment services for men through scale up of DSD models for men such as Mens Clinics and community HIV care and treatment posts. Through TA to the MoH, a toolkit for finding men initiatives, a digital interventions guide and a virtual intervention for men was developed to reach men as Zambia moves towards achieving the first 95. To support the national plan to reduce HIV related mortality, CIDRZ supported the MOH to develop an Advanced HIV disease implementation framework. Through TA to the MoH, CIDRZ supported monitoring and evaluation for HIVST to reach priority and key populations as Zambia moves towards achieving the first 95. Adaptations through HIVST will allow for continued HIV testing services during response to future pandemics.

Voluntary Medical Male Circumcision NEXUS Study

Funder:
Bill & Melinda Gates Foundation

Time Period:
Nov 2022 - Apr 2024

In 2019, BMGF funded the VMMC NEXT consortium to review program data with the MoH's VMMC Program Team to identify and clarify successes and challenges. To address challenges identified during the VMMC Next study such as maintaining VMMC outreach during the lockdowns of the COVID-19 pandemic, and the greater acceptability and uptake of digital health solutions resulting from the pandemic, the consortium worked with CIDRZ's App development team to design and develop the VMMC NEXUS Digital Mobilization Tool.

The hypothesis of this study is that targeted interventions assisted by the Digital Mobilization Tool, will better meet the needs of potential clients and, therefore, improve the uptake of VMMC services.

The study is being conducted across 30 intervention sites, relative to 30 control sites. Currently the study is undergoing data analysis and findings will be disseminated in FY24.

03

BASIC SCIENCE AND LABORATORY

- CIDRZ Laboratory Innovation for Excellence
- Zambia Anti-Microbial Resistance

CIDRZ Laboratory Innovation for Excellence

Funder:
The Center for Disease Control and Prevention

Time Period:
Oct 2018 - Sep 2023

The goal of the CIDRZ Laboratory Innovation for Excellence (LIfE) project was to scale laboratory services and provide high-quality HIV diagnosis, care, and treatment towards the achievement of the 95-95-95 goals in Zambia under PEPFAR.

The team has been accelerating HIV VL and early infant diagnosis (EID) use for clinical care through strengthening laboratory systems by improving VL/EID sample courier networks, capacitating laboratories, enhancing Quality Management Systems (QMS), facilitating electronic laboratory data management, and results reporting.

The project worked in close collaboration with donors, the MOH, and international and local implementing partners APHL, CLSI, FIND, and WHC.

Collectively, the project accomplished several milestones. This included building the capacity of 24 VL/EID laboratories to enhance operational efficiencies and providing training, technical support, and mentorship to over 120 hub laboratories and their staff. Additionally, the project facilitated the transition from paper-based to digital data capture systems in all districts across four provinces, with individual facility-level transitions completed in three provinces. A regular sample-agnostic laboratory courier system was established using a hub and spoke model across four provinces, subsequently transitioning control to the government. Collaboration with partners and the MOH established a laboratory monitoring and evaluation system in over 120 hub labs and more than ten central laboratories, ensuring optimal functionality of the HIV testing cascade. QMS were implemented in over ten labs, with local mentors trained to transition the programme to government oversight.

Furthermore, the project supported the development of quality management system standards for district health laboratories conducting HIV testing using point-of-care equipment. Waste management systems in 21 central laboratories were improved through incinerator repairs or installations, alongside training for environmental health and laboratory staff. Solar energy support was extended to health facilities nationwide, benefiting over 120 hubs and central labs and enhancing laboratory and SmartCare operations. Lastly, Diagnostic Network Optimization was coordinated to facilitate the expansion of CD4 testing in Lusaka Province.

Zambia Anti-Microbial Resistance

Funder:
The Flemming Fund

Time Period:
Sep 2019 - Dec 2023

Anti-Microbial Resistance (AMR) is a global problem that compromises a nation's ability to treat infectious diseases, oftentimes reversing the myriad gains made in health care and medicine. At the 68th World Health Assembly (WHA) in May 2015, a global action plan to tackle AMR, including antibiotic-resistant and other urgent drug-resistant bacteria, received endorsement.

The Fleming Fund country grant worked with MOH structures, including ZNPHI, AMRCC, TWGs under the AMRCC, and other national stakeholders, to ensure Zambia makes significant strides in achieving targets set in the global and national AMR action plans. The grant supported critical activities in the surveillance of AMR bacteria in Zambia, with the primary objective of supporting theGRZ in strengthening and scaling quality AMR diagnostics and antimicrobial use (AMU) surveillance activities in public health hospital facilities.

The grant-supported activities sought to improve the quality and quantity of actionable data available to inform national policy on the detection and prevention of AMR bacteria. The grant supported seven hospital laboratories and five animal health laboratories in line with strengthening capabilities in microbiology, with the continued output of generating high-quality surveillance data.

In the final grant period, we procured critical reagents and consumables utilised in the 12 supported laboratories. These are the labs that have generated quality data utilised for local facility decision-making and formed the bulk of data reported internationally to the Global Antimicrobial Resistance and Use Surveillance System (GLASS). During the same period, the grant continued supporting capacity building of technical staff (those conducting microbiology procedures in hospital laboratories and regional animal health laboratories) through on-site microbiology and M&E mentorships.

The growing breadth and depth of data generated, coupled with the skill set imparted to the surveillance site staff, has provided a foundational platform for bodies such as Antimicrobial Stewardship Committees (AMS) that are supporting prudent use of antimicrobials based on evidence from locally generated data.

The grant supported hospital laboratories to use data to generate antibiograms to inform clinical decisions. National AMR data from the supported sites was analysed with the aid of the grant team and presented at several forums, including the AMRCC meeting. In its final year, the grant supported the government during the commemoration of World Antimicrobial Awareness Week (WAAW). The grant has been part of several fora where different AMR-related policy documents have been developed and/or revised. Phase II of the Country Grants, scheduled to begin in January 2024, will support the continuation of activities and gains of Phase I with proposed investment areas of surveillance AMR bacteria in food, beef, dairy, and the environment.

The grant played a crucial role in strengthening Zambia's capacity to combat antimicrobial resistance (AMR) by supporting surveillance activities, enhancing diagnostic capabilities, and providing critical resources for laboratories

04

ENTERIC DISEASES

- ETVAX III - ETEC Surveillance Study
- Epidemiology And Molecular Characterisation of Enteropathogens In Children Under The Age Of 5 Years Presenting With Diarrhoea In Zambia.
- Expanded Diarrhoea Surveillance Study
- Immune Responses After Rotavirus Challenge
- Human Challenge with Live-Attenuated Rotavirus To Assess Next-Generation Rotavirus Vaccines In Africa.
- HIV Viral Reservoir Project
- HIV - Class study
- Non-Replicating Rota Virus Study
- ROTA-biotic: measuring the impact of rotavirus vaccines on paediatric antibiotic usage
- SHIGORAVAX Project
- WELLCOME TRUST FELLOWSHIP-T-Cell Responses in Rotavirus Vaccinated Zambian Infants: Impact Of Human Cytomegalovirus Infection.

ETVAX III - ETEC Surveillance Study

Funder:

European and Developing Countries Clinical Trials Partnership

Time Period:

Feb 2020 - Feb 2025

Enterotoxigenic E. coli (ETEC) is one of the major causes of moderate-to-severe diarrhoea (MSD) among children globally, as well as in Zambia. This study aims to document the burden of ETEC-associated diarrhoea in Zambian children under the age of three. We seek to determine diarrhoea aetiology, calculate the incidence of moderate-to-severe ETEC-associated diarrhoea, and describe the frequency of ETEC colonisation factors and enterotoxin types in children under three years old in Zambia.

The prospective, longitudinal, and observational study was conducted in five clinical research sites: Chawama General Hospital, Matero General Hospital, Chainda South Clinic, George Clinic, and Kanyama General Hospital. The study began by conducting a household census within the catchment areas of participating health facilities for a total of 4,065 surveyed households. This was followed by passive 12-month diarrhoea surveillance at each participating health facility.

The study was completed in October 2021, and analysis for determination of the incidence of ETEC and other confections was completed in June 2022. The results were presented at the 10th Zambian National Health Conference held in Lusaka and the Vaccines against Shigella and ETEC (VASE) conference in Washington, DC, in November 2022. The investigators are currently preparing manuscripts for publication as they also prepare the site for the phase III efficacy study to evaluate the ETVAX vaccine. ETVAX® is the brand name for a vaccine against a bacterium that causes diarrhoea

Epidemiology And Molecular Characterisation Of Enteropathogens In Children Under The Age Of 5 Years Presenting With Diarrhoea In Zambia.

Funder:

The Center for Disease Control and Prevention

Time Period:

Oct 2019 - Sep 2023

This study sought to give information on the burden of viral and bacterial causes of diarrhoea in children under five, focusing on both outpatient and hospitalised children. The study was conducted initially at five sites in Lusaka and one site in Ndola. This year's focus was on hospitalised children, so sample collection was only done at ADCH. The study resulted in technical support in microbiology to ADCH and enhanced collaboration between ADCH and CIDRZ as well as additional data on the aetiologies of diarrhoea on the Copperbelt region.

Expanded Diarrhoea Surveillance Study

Funder:

The Center for Disease Control and Prevention,

Time Period:

Oct 2022 - Sep 2024

CIDRZ's Laboratory Innovation for Excellence (Life) Project and the MOH are working on increasing capacity for public health laboratories. Due to limited molecular diagnostic capacity in LMICs, most diarrheagenic aetiologies remain undetected. The purpose of this study is to determine diarrhoea aetiology and evaluate the burden of moderate-to-severe enteric pathogens associated with diarrhoea in children using a multiplex assay on an RT-PCR platform from samples collected from one health facility in each of the ten provinces in Zambia.

Immune Responses After Rotavirus Challenge

Funder:
Bill and Melinda Gates Foundation

Time Period:
Oct 2020 -Oct 2023

Rotavirus infection causes severe diarrhoea and is responsible for over 130,000 child deaths every year in the developing world. Although available oral rotavirus vaccines have reduced the overall diarrhoea disease burden, Rotavirus diarrhoea remains the leading cause of hospitalisation and death among young children in developing countries.

The HIC Rota study was a single centre, open label, randomised controlled trial enrolling 720 infants and their mothers to assess the benefit of combined Rotavirus vaccination schedules. Enrolled children received parenteral trivalent P2-VP8 subunit vaccine administered as three doses alone or as one or three doses combined with two doses of live-attenuated oral rotavirus vaccine compared with two doses alone.

Follow-up work to better understand the T and B cell immune responses following vaccination in an additional cohort of children was proposed and funded (HIC Gates). The HIC Rota study could provide useful insights into immune responses following RV vaccination by exploring the benefits of combined parenteral and oral RV in young children.

Human Challenge With Live-Attenuated Rotavirus to Assess Next-Generation Rotavirus Vaccines in Africa

Funder:
Medical Research Council- UK through Imperial College of Science, Technology and Medicine

Time Period:
Sep 2020 - Aug 2023

The HIC Rota study assesses protection against rotavirus infection and investigates immune correlates of protection following vaccination with a novel injectable VP8 subunit rotavirus vaccine used alone or in combination with oral rotavirus vaccines trial is conducted in collaboration with the Imperial College London and PATH.

Before beginning recruitment, the study received all ethical and regulatory approvals from UNZABREC, ZAMRA (Zambia Medicines Regulatory Authority), and NHRA (National Health Research Authority). This year, the study successfully completed enrolment, with over 85% reaching their primary study endpoints of post-challenge follow-up.

Regarding laboratory testing and analysis, the team has achieved significant progress. They have established and commenced running quantitative PCR assays to monitor rotavirus shedding post-challenge. They have finished conducting whole blood ELISOPT assays on a subset of study participants and are currently in the process of validating the ELISA assay. The study received extra funding from BMGF to conduct additional T and B cell immunology research, aiming to elucidate which subsets are correlated with protection post-vaccination.

HIV Viral Reservoir Project

Funder:
AidFonds/ Erasmus MC

Time Period:
Mar 2018 - Jul 2023

This project focused on assessing the HIV viral reservoir in Africans, specifically young female populations. The results from this study will provide an African perspective to the ongoing HIV cure research.

HIV - Class Study

Funder:
Bill & Melinda Gates Foundation

Time Period:
Apr 2023 - Apr 2025

This study is nested under the Profiling Immunological Characteristics of a Population at Risk of Cholera before and after first and second doses of Oral Cholera Vaccine, conducted in Lukanga Kabwe. Participant samples that test positive for HIV are analysed for human leukocyte antigen (HLA) class I genes, as it has become increasingly evident that the development of an effective HIV vaccine, capable of preventing HIV transmission, will likely necessitate a coordinated T and B cell response. Stored Peripheral Blood Mononuclear Cells (PBMCs) from the parent study and newly collected samples will be used to identify HLA class I alleles that restrict mutationally constrained HIV epitopes in eastern and southern African individuals; determine HLA diversity when compared to other eastern and southern African populations; and, generate a publicly available HLA database for the same.

Non-Replicating Rota Virus Study

Funder:
PATH with support from Bill & Melinda Gates Foundation

Time Period:
Apr 2019 - Jun 2024

This study assesses the safety and immunogenicity of a new parenteral rotavirus vaccine. Infants are randomised to receive either the active comparator, which is Rotarix, and for the placebo, a locally licensed Oral Rehydration Solution, or the infant will receive intramuscular (IM) TV P2-VP8 with the placebo of normal saline and followed up for two years.

In the past year, upon futility analysis with the set criteria of TV P2-VP8 being superior to the oral rotavirus vaccine, the study, unfortunately, met the futility criteria indication that the candidate vaccine was not superior to the current licensed ones.

The study is now following the participants and tracking any episodes of gastroenteritis to run an efficacy analysis to determine the actual efficacy of the TV P2-VP8 and other secondary analyses to further understand the immunogenicity of the candidate vaccine in this population. The follow-up for the primary endpoint was closed in June 2023.

ROTA-biotic: Measuring the Impact of Rotavirus Vaccines on Paediatric Antibiotic Usage

Funder:
Wellcome Trust through Amsterdam Institute for Global Health and Development (AIGHD)

Time Period:
Jun 2020 - Jun 2024

This study, carried out in Ghana and Zambia, seeks to evaluate the impact of rotavirus vaccinations on antibiotic usage by quantifying the incidence of community antibiotic usage in the first two years of life. It also profiles the microbiome composition of both vaccinated and unvaccinated infants; the latter forming the control group.

The study has two arms: a vaccinated cohort that will give prospective information on antibiotic usage for infants enrolled in the parent trial and the community cohort arm that will inform on the background incidence of community antibiotic use. The vaccinated cohort is further divided into two arms; in one, the participants are followed up weekly for antibiotic usage data, while in the other, participants are not subjected to medication or weekly follow-up. However, they do have their samples collected at specific intervals.

The study is being conducted in three Zambian research sites: Matero Level 1 Hospital, George Clinic, and Chainda South Clinic. The collected samples, stool, and urine will be used for metagenomic sequencing and urine antibiotic metabolites analysis. In the past year, the study finished recruiting participants and began following them up to the second year of life.

This is a nested study under the NRRV vaccine trial study, the study exited every participant until the last enrolled participant was one year old (March 2023). This is in view of the futility of the parent study (NRRV) meeting, hence a reduction in our intended follow-up time. Data analysis is ongoing with planned dissemination next year (FY24).

SHIGORAVAX Project

Funder:
European and developing countries' clinical trials partnership

Time Period:
Oct 2019 - Sep 2024

Shigella infection is among the leading causes of childhood diarrhoea, estimated to cause as many as 164.7 million cases annually, of which 163.2 million occur in LMICS. The EDVRU (Enteric Disease and Vaccine Research Unit) at CIDRZ showed that Shigella was the second leading attributable cause of moderate-to-severe diarrhoea (MSD) in Zambian children under five years of age.

There is currently no licensed vaccine against Shigella, which is unfortunate because it could be a cost-effective and reliable way to decrease morbidity and mortality in the face of poor water, sanitation, and hygiene (WASH) facilities.

During the current reporting period, the study team accomplished several milestones. Firstly, they presented their findings at the 10th Zambian National Health Conference in Lusaka in October and at the Vaccines against Shigella and ETEC (VASE) conference in Washington DC in November 2022. Currently, they are in the process of preparing manuscripts for publication based on these presentations. Secondly, they provided capacity building and technological support to Groupe de Recherche Action et Santé (GRAS) in Burkina Faso for their surveillance study. Lastly, whole genome sequencing was conducted on isolates from the study, and data analysis is underway to determine the relatedness of Zambian isolates to those in the region, as well as to identify the antimicrobial genes present in strains circulating in the population.

Wellcome Trust Fellowship-T-Cell Responses In Rotavirus Vaccinated Zambian Infants: Impact Of Human Cytomegalovirus Infection.

Funder:
Wellcome Trust

Time Period:
Mar 2018 - Jul 2023

This PhD-level project was awarded to Miss Natasha Laban (Wellcome Trust International Fellowship 211356/Z/18/Z). The study is nested within the EDCTP ROVAS-2 project and is registered with the London School of Hygiene and Tropical Medicine.

The PhD study measures T-cell responses in rotavirus-vaccinated infants and investigates the influence of human cytomegalovirus on the vaccine immunogenicity in Zambian infants. The study, conducted at George Health Centre, continues to test cell samples to generate data on T-cell immune responses. During the period under review, the primary paper was published (see publication section), and an article reporting the influence of cytomegalovirus on vaccine-induced rotavirus-specific antibody responses and seroconversion is in preparation.

05 IMPLEMENTATION SCIENCE

- Better Info South Africa
- Home Testing and Mobile Linkage to Empower Health Care in LMICs
- Enhancing SRHR and Menstrual Hygiene for Adolescents, Including Differently Abled Adolescents
- Optimizing Care Delivery to Support Re-engagement in People Living with HIV Returning to HIV Care After Treatment Lapses in Zambia
- Domestication and Implementation of the PEN-Plus Clinical Model in the Zambian Health System
- Person-centred Approaches to Viremia: Contact, Rapport, and Engagement
- Prison PrEP Values Adherence and Implementation in Lusaka
- Reaching 90 90 90 in Adolescents in Zambia: Using all our SKILLZ
- Strengthening Quality Improvement through Person-Centred Care
- Application of Implementation Science approaches to assess the effectiveness of Task-shifted WHO-PEN to address cardio metabolic complications in people living with HIV in Zambia

Better Info South Africa

Funder:
Bill & Melinda Gates Foundation

Time Period:
Oct 2023 - Jan 2026

By building on the work of BetterInfo in Zambia, we have provided technical support for implementation in South Africa. BetterInfo Zambia investigated why PLHIV disengaged from care after initiating ART and explored potential ways to encourage PLHIV to return to care. The study found that disengagement was mainly because of more PLHIV having died while only fewer PLHIV were lost to follow-up. This research provided insights into the reasons for disengagement and potential ways to encourage PLHIV to return to care.

The BetterInfo South Africa study plans to use a similar approach, establishing a cohort of PLHIV in KwaZulu-Natal, to analyse their patient journey. The goal is to identify the entry and exit stages in the care process and understand the factors affecting different populations. By predicting PLHIV trajectories, the study aims to develop targeted interventions to improve long-term retention and re-engagement in care.

Home Testing and Mobile Linkage to Empower Health Care in LMICs

Funder:
Bill & Melinda Gates Foundation

Time Period:
Oct 2022 - Oct 2023

This study informs the design and implementation of subsequent clinical intervention trials of a patient-centred diagnostic technology intervention package for self-care and improved health access in LMICs.

The research objective was to characterize the feasibility and preferences for developing a patient-centred, integrated healthcare package to facilitate routine screening and treatment initiation for infectious and chronic non-communicable diseases (NCDs).

Enhancing SRHR and Menstrual Hygiene for Adolescents Including Differently Abled Adolescents

Funder:
MAC AIDS Fund

Time Period:
Sep 2022 - Sep 2023

This project seeks to educate both abled and differently abled adolescents in sexual reproductive and health rights and menstrual hygiene. The differently abled adolescents have unique needs and challenges as they navigate adolescence, so we partnered with the Zambia Agency for Persons with Disabilities (ZAPD) to identify adolescents with disabilities in the community and recruit them into the programme. Apart from education on menstrual hygiene management, we have also worked with community schools to supply water buckets and soaps for handwashing. We have also distributed reusable pads.

Optimizing Care Delivery to Support Re-engagement in People Living with HIV Returning to HIV Care After Treatment Lapses in Zambia

Funder:
National Institute of Health

Time Period:
Apr 2022 - Mar 2026

This study is structured around three primary aims. Aim 1 constitutes the quantitative arm, employing best-worst scaling experiments to gather data from both patients and providers. Aim 2 utilises qualitative methods to investigate the optimization of experiences among PLHIV upon returning to care, involving both patients and HCWs. Aim 3 is focused on applying HCD principles to collaboratively develop a multi-component reengagement strategy. To date, accomplishments include the development of data collection tools for the study, the establishment of SOPs, recruitment and training of study staff, and amendments made to the initial study protocol. Additionally, sensitisation meetings for the re-engagement study were conducted between May and June of 2023, at provincial, district, and health facility levels.

Domestication and Implementation of the PEN-Plus Clinical Model in the Zambian Health System

Funder:
The Leona M. & Harry B. Helmsley Charitable Trust

Time Period:
Nov 2021 - Oct 2024

PEN Plus complements the WHO Package for Essential NCDs (PEN). Whereas WHO PEN focuses on primary care for common chronic NCDs, PEN-Plus focuses on care at the secondary level for more severe conditions, including type 1 diabetes, sickle cell disease, and rheumatic heart disease. PEN-Plus is a clinical model providing high-quality longitudinal care for people with severe and chronic NCDs.

The MOH officially opened two pilot sites at Matero and Mwachisompola first-level hospitals in April 2023, and to date, over 1,000 NCD patients have been enrolled. The NCD clinics are staffed with HCWs who have undergone intensive didactic training sessions in the priority conditions and clinical attachments. They are also supported through ongoing onsite clinical mentorship to improve diagnosis, linkage to care, and retention in care for patients with severe NCDs.

Working closely with the MOH and other national stakeholders, the project is scheduled to evoke conversations that will describe, measure, and advocate for PEN-Plus and support the development of a national PEN-Plus operational plan for scale-up.

Person-centred Approaches to Viremia: Contact, Rapport, and Engagement

Funder:
Bill & Melinda Gates Foundation

Time Period:
Nov 2023 - Apr 2027

This study has three main objectives. Firstly, it aims to assess barriers to sustained viral suppression by identifying prevalent pathways to viremia, such as unmeasured or documented viremia, with a specific focus on vulnerable groups including pregnant women, children, adolescents, men, and those initiating antiretroviral therapy (ART). Secondly, it seeks to utilize HCD methods, incorporating input from community members, healthcare facility representatives, and health system stakeholders, to collaboratively develop person-centred pathways aimed at strengthening viral suppression, particularly among vulnerable groups such as children, adolescents, ART initiators, and pregnant, and breastfeeding women. Lastly, the study intends to evaluate the effectiveness of the person-centred P-CoRE package, which connects service delivery to patients, fosters rapport, and enhances engagement in care to promote viral suppression. This evaluation will be conducted through a parallel cluster-randomized trial, focusing on high-priority populations that contribute disproportionately to ongoing viremia.

Prison PrEP Values Adherence and Implementation in Lusaka

Funder:
National Institute of Mental Health (NIMH) at the United States (U.S.) National Institute of Health

Time Period:
Apr 2023 - Mar 2025

Incarcerated people are a key population facing a disproportionately high HIV burden not only in Zambia, but across sub-Saharan Africa. Yet almost nothing is known about their patterns of HIV risk behaviours or PrEP use during and after incarceration, which are thought to be times of substantial risk for HIV acquisition. The Prison PrEP Values Adherence and Implementation in Lusaka (PreVAIL) study is a partnership between the University of Maryland at Baltimore (UMB) and CIDRZ to understand patterns of PrEP uptake and persistence, HIV incidence, and HIV risk perception among incarcerated people in Zambia, and to assess facilitators and barriers to efficacious PrEP use in this population both during and after incarceration.

As of September 2023, the study had screened 124 incarcerated persons across three study sites in Lusaka and enrolled 120 (97%) consenting participants. Insights from this study will help inform the development of a future differentiated service delivery model to deliver effective HIV prevention services to justice-involved persons and provide critical information to surmount last-mile barriers to HIV epidemic control in Zambia, with applicability across other LMICs.

Reaching 90 90 90 in Adolescents in Zambia: Using all our SKILLZ

Funder:
National Institute of Health

Time Period:
Aug 2018 - May 2024

SKILLZ is an experimental study in 46 school communities randomly assigned (1:1) to either the SKILLZ package or regular school-led comprehensive sexuality education programs (CSE). The SKILLZ package includes four integrated programmes, including the SKILLZ Girl curriculum; linkage to convenient, high-quality, and adolescents-friendly services; mental health screening and active linkage to psychosocial therapy (if needed); and teen clubs.
This study took place across the high-density areas of Chilanga, Chongwe, Kafue, and Lusaka districts, where CIDRZ supports MOH clinics with ARV services, electronic data management, and youth-friendly trained clinical personnel, and where Grassroot Soccer (GRS) has been implementing their basic SKILLZ Girl curriculum and events in secondary schools.

Data collection has been completed, and preliminary analysis is ongoing. The team is also working on the primary qualitative and quantitative papers. So far, a total of three abstracts have been submitted and accepted at international conferences: two at the IAS 2023 and one at the ICASA conference.

Strengthening Quality Improvement through Person Centred Care

Funder:
Bill and Melinda Gates Foundation

Time Period:
Sep 2022 - Aug 2024

The Strengthening Quality Improvement through Person-Centred Care Project aims to improve the quality of public health services in Zambia, leading to better outcomes for all by supporting the development of the Ministry of Health's quality and performance improvement strategy.

The project has made significant progress thus far, including the establishment of terms of reference/ letter of agreement between the MOH Quality Improvement/Performance Improvement (QI/PI) unit and the SQI-PCC CIDRZ project. This commitment involves the training of HCWs in person-centred care (PCC), the development of a sustainable PCC package, and the integration of PCC into policy documents and routine service delivery. Additionally, policy entrepreneurs have been identified and trained to advocate for PCC. The project conducted a review of the QI/PI landscape in Zambia, resulting in the development of a comprehensive report and presentation. Critically, there has been buy-in on PCC from MOH leadership. ToTs in PCC were conducted in five districts, with support from CDC and CIDRZ PROUD-Z, which have subsequently rolled out training for HCWs in PCC. Moreover, ongoing light-touch mentorship in PCC was provided in 24 facilities. The project also organized a PCC-themed National Quality Improvement Conference, emphasizing PCC as an approach for enhancing healthcare quality and improving people's well-being, which was the central theme of the conference held in 2023.

Application of Implementation Science approaches to assess the effectiveness of Task-shifted WHO-PEN to Address Cardio Metabolic Complications in People Living with HIV in Zambia

Funder:
National Heart, Lung, Blood Institute at the U.S. National Institutes of Health

Time Period:
Oct 2020 - Aug 2025

The TASKPEN study is a five-year milestone-based collaboration between CIDRZ and UNZA. TASKPEN focuses on task shifting and integration of WHO-PEN to manage cardiometabolic comorbidities and complications of HIV in routine care settings for PLHIV in Lusaka. The trial evaluates the clinical effectiveness and implementation outcomes of the TASKPEN package for the integration of cardiometabolic NCD care in routine HIV care settings.

In 2023, the project expanded the TASKPEN package to 12 health facilities in Lusaka using a cluster-randomized, hybrid type two effectiveness-implementation stepped wedge trial design. We have engaged national and international stakeholders in the study design and implementation, enrolled over 1,500 participants, introduced the intervention at four health facilities, trained and mentored dozens of HCWs, and presented our pilot findings at various national and international forums. In September 2023, we secured two supplement awards to strengthen the intensity and fidelity of the TASKPEN package and understand ways to refine components of our intervention using the novel 'Learn as You Go' method.

06

NETWORK TRIALS

- CAPRISA 012C: A double-blinded, randomized, placebo-controlled phase II trial to assess extended safety and tolerability of subcutaneous CAP256V2LS and VRC07-523LS in HIV-negative women.
- COVPN 3008 - Multi-Center, Randomized, Efficacy Study of COVID-19 mRNA Vaccine in Regions with SARS-CoV-2 Variants of Concern
- CTU Core Matero - A-Z Clinical Trials Unit

CAPRISA 012C: A Double-blinded, Randomized, Placebo-controlled Phase II Trial to Assess Extended Safety and Tolerability of Subcutaneous CAP256V2LS and VRC07-523LS in HIV-negative Women.

Funder:
European and Developing Countries Clinical Trials Partnership

Time Period:
Aug 2023 - Dec 2024

The purpose of the study is to assess the extended safety and tolerability of subcutaneous CAP256V2LS and VRC07-523LS monoclonal antibodies in HIV-negative women to assess extended safety and obtain an estimate of efficacy in preventing HIV infection in young women. The study is in the implementation phase and will enroll 990 HIV-negative women between the ages of 18 and 30, with 75% of the study population enrolled in two sites in South Africa and 25% at the Matero Clinical Research Site (CRS) in Zambia.

The Matero CRS was activated in August 2023 and has screened 25 and enrolled four participants with 15 pending enrolments. Participants will be followed for 12 months and will receive two doses of investigational product at month zero and month six.

COVPN 3008 - Multi-Center, Randomized, Efficacy Study of COVID-19 mRNA Vaccine in Regions with SARS-CoV-2 Variants of Concern

Funder:
National Institute of Health

Time Period:
Jan 2022 - Jan 2024

Thus far, the study enrolled over 14,000 participants, and all study vaccinations were completed in March 2023. Participant retention in the study has remained very high, at more than 95%. Matero CRS enrolled 351 participants and is currently following up with 30 participants through March 2024.

The research team aims to address several inquiries, including the optimal number of doses of COVID-19 mRNA vaccine required to provide sufficient protection for adults living with HIV, including those with prior infection. Additionally, the safety and tolerability of COVID-19 mRNA vaccines among this population are under investigation. Furthermore, the efficacy of a bivalent COVID-19 mRNA vaccine administered at month six in comparison to the original vaccine is being examined to determine if it offers equivalent or improved protection against COVID-19. Finally, the duration of SARS-CoV-2 infections in individuals and whether prolonged infections are associated with specific health conditions or alterations in the virus are also areas of focus for the study.

CTU Core Matero - A-Z Clinical Trials Unit

Funder:
National Institute of Health

Time Period:
Dec 2020 - Jan 2024

The Alabama-to-Zambia CTU continues to support the NIAID HIV/AIDS scientific priorities through therapeutics and prevention trials.

This award supports regulatory, clinical, data, laboratory, and implementation activities for all active Clinical Trials Unit-affiliated studies being conducted at the Matero Clinical Research Site (CRS).

Over this reporting period, the funding supported the retention of the 351 participants enrolled in the CoVPN 3008 study under the CoVID-19 Prevention Network.

07

PAEDIATRICS AND CHILD HEALTH

- Community Comprehensive Health Package for Adolescents and Young People
- Magnetic Resonance Imagining Ancillary Study of Malaria FEVER Randomized Controlled Trial

Community Comprehensive Health Package for Adolescents and Young People

Funder:
The Global Fund to Fight AIDS, Tuberculosis and Malaria/MOH

Time Period:
Aug 2022 - Dec 2023

CIDRZ, with support from Global Fund (GF) through the MOH, implemented the Community Comprehensive Health Package for Adolescents and Young People (C-CoHP) Project in Mongu, Sesheke and Limulunga districts of Western Province. The project aimed to improve health outcomes for Adolescents and Young People by utilising a holistic service approach. At the centre of service provision are Adolescent Peer Educators - frontline workers. They provide services ranging from Family delivery of the Comprehensive Sexuality Education (CSE) sessions, planning, GBV first-line support, mental health care, and support, community mobilisation, and sensitisation. They are supervised by project District Implementation Officers. The targeted number of adolescents and young people for the project is 45,764, and by September 30th, 28254 had been reached.

Magnetic Resonance Imagining Ancillary Study of Malaria FEVER Randomized Controlled Trial

Funder:
University of Rochester (UR), Rochester, NY, USA

Time Period:
Feb 2023 - Feb 2024

In an MRI Ancillary Study of Malaria FEVER Randomised Control Trial (RCT) we proposed to use neuroimaging in the context of the RCT to evaluate the potential neuroprotective effects of aggressive antipyretic therapy for CNS malaria and explore possible mechanisms for these effects. Comparing children allocated to aggressive antipyretic therapy versus usual care on the prevalence of structural brain abnormalities after recovery from CNS malaria will facilitate the evaluation of non-fever pathways for neuroprotection. Brain MRIs will be obtained in children enrolled in the RCT at one- and 12-months post-recovery.

Analyses will be completed comparing the odds of having any structural injury based on RCT treatment allocation and on Tmax stratified by treatment allocation to assess changes specifically related to therapy response regarding fever reduction. Potential mechanisms of aggressive antipyretic-related injury will be evaluated, including assessments for treatment-related CNS bleeds. This study will provide critical insights informing future neuroprotective studies of malaria that incorporate imaging to optimise study design. Data collection for all participants has been completed and under analysis currently.

08 PRIMARY CARE - HEALTH SYSTEMS STRENGTHENING

- COVID-19 Vaccines Delivery Support (CDS) Early Window Assess (EAW)
- CDS - Needs-based
- CDS - Third Round
- Partnership Engagement Framework Technical Country Assistance (PEF TCA) - PEF III
- PEF TCA IV
- Polio Lab Sample Transport - Zambia
- Rotavirus Vaccine Switch

COVID-19 Vaccines Delivery Support Early Window Assess

Funder:
Gavi, the Vaccine Alliance

Time Period:
Oct 2021 - Dec 2022

The MOH, with support from partners, introduced COVID-19 vaccination in April 2021. Gavi launched the COVID-19 vaccines Delivery Support (CDS) funding window to address urgent gaps impacting the roll-out and scale-up of COVID-19 vaccines received through the COVAX Facility. CDS Early Window Assess (EAW) began in December 2021 with a focus on priority activities essential for immediate vaccine deployment and scale-up of COVID-19 vaccination. The implementing partners included CIDRZ, UNICEF, and WHO for a total grant amount of US$ 1,920,838, with CIDRZ receiving $810,767.

As this grant was winding down, the remaining activity was providing support for the October 2022 campaign, where CIDRZ supported outreach for 85 vaccination sites during the 7-day campaign; All deliverables were met, and the grant closed in December 2022.

CDS Needs-based (NB)

Funder:
Gavi, the Vaccine Alliance

Time Period:
Dec 2022 - Dec 2025

CDS NB funding aligned the main pillars of vaccine delivery, incorporating lessons from CDS EAW and those outlined in the National Vaccine Deployment Strategy. The total grant is led by the MOH and delivered through four partners: CHAZ, CIDRZ, UNICEF, and WHO.

The country has continued to increase its COVID-19 immunization coverage, and all 116 districts have attained fully immunized COVID-19 coverage above the targeted 70%.

CIDRZ supported two campaigns during the fiscal year, one in 18 low-performing districts in March and one nationwide in October, vaccinating over half a million and 1.8 million, respectively.

CIDRZ supported vaccination site (1,168) trainings for the first campaign in 44 districts. CIDRZ worked with the MOH to support microplanning trainings in 18 districts across 534 health facilities (HF) for the targeted campaign. The trained HCWs developed COVID-19 vaccine microplans according to national guidelines, which were consolidated into district microplans for sub-national planning and coordination. CIDRZ also supported vaccinator outreach activities in 1,302 HFs in the first campaign and 387 HFs in the targeted support.

CDS Third Round

Funder:
Gavi, the Vaccine Alliance

Time Period:
Jul 2023 - Dec 2025

This grant supported the acceleration of vaccination of high and highest-risk populations, delivery scale-up to reach country targets for adult vaccination, and the integration of COVID-19 and routine immunization to achieve sustainable benefits. The third round of funding is being implemented through the MOH with CHAZ, CIDRZ, UNICEF, and WHO support.

Activities under this award have been delayed due to changes in the strategy to revitalise routine immunisation combined with COVID-19 integration.

PEF TCA III

Funder:
Gavi, the Vaccine Alliance

Time Period:
Jul 2021 - Mar 2023

This PEF TCA project supported the MOH's Expanded Programme on Immunizations (EPI) to strengthen health systems and build capacity to catalyse sustainable efficiencies and change, and to improve coverage and equity. The objectives were to strengthen management and governance capacity, capacity building of the immunization supply chain and sub-national health systems, data utilisation, and support coordination and functioning of national EPI activities.

All activities aligned with attaining the objectives and were completed on time. A follow-up TA grant was awarded following the completion of this grant. Activities included support to the sub-national health systems strengthening for campaigns and Adverse Events Following Immunization (AEFI) orientations and analysis of EPI performance that fed into a five-year planning strategy and grant development.

PEF TCA IV

Funder:
Gavi, the Vaccine Alliance

Time Period:
Feb 2023 - Mar 2024

CIDRZ has provided TA to the MOH's Expanded Programme on Immunisations (EPI) to extend immunization services to reach zero-dose children and missed communities.

This comprehensive support has encompassed various aspects, including integrating service delivery, improving stock management for vaccines and devices, and strengthening governance and technical capacities. Furthermore, CIDRZ has actively contributed to addressing outbreaks such as Measles Rubella (MR) and polio. MR coverage was 116% and 107% after the response activities for nOPV. CIDRZ supported MOH on the Full Portfolio Planning process, of which a detailed analysis of zero-dose children was conducted, and a 5-year strategy and proposal was submitted to Gavi for approval.

The project seconds a Senior Logistician to EPI who facilitates the process of obtaining and submitting all immunisation cost estimates. Two quarterly vaccine and device forecast reviews were conducted. Two ZITAG meetings were supported to provide recommendations on integrating COVID-19 vaccination into routine immunization services/PHC, along with recommendations for booster doses. Additionally, ZITAG met to consider the introduction of the malaria vaccine in the country.

Polio Lab Sample Transport - Zambia

Funder:
VillageReach

Time Period:
Oct 2022 - Mar 2024

CIDRZ is working in collaboration with the Zambia National Public Health Institute (ZNPHI), the MOH, and partners to strengthen the country's polio Sample Referral System (SRS). The expected outcome is an efficient, high-performing, and well-coordinated transportation system that improves the timeliness and quality of sample delivery and reduces staff time spent away from healthcare activities.

For Acute Flaccid Paralysis (AFP) samples, the project worked with districts to engage a "stool runner" trained to transport samples to the national lab in Lusaka appropriately. Polio is tested through stool. CIDRZ is responsible for samples in seven provinces. On average, sample transport time had improved to 83% and sample quality 100% since the project's inception.

The project analysed lab data each month and troubleshooted with the districts on performance issues to maintain quality and timeliness standards. The project has supported other activities to strengthen polio SRS, including data harmonization and SRS integration of SRS meetings, TSS/mentorship in 32 districts, and the procurement of buffer stocks of triple packing materials for the ES sites. The project also conducted a remote temperature monitoring (RTM) pilot in 5 ES sites.

Rotavirus Vaccine Switch

Funder:
Gavi, the Vaccine Alliance

Time Period:
Mar 2023 - Dec 2024

CIDRZ aided the MOH in introducing rotavirus vaccines into the national immunisation program in 2013. Globally, the current rotavirus vaccine supply was scarce, resulting in national stockouts for over a year and the subsequent switch from Rotarix to Rotavac.

The project supported the GRZ in planning and coordinating the switch, starting with developing required documents, including the implementation plan, job aids, and training materials. CIDRZ supported training at all levels, from national to health facilities.

The rotavirus vaccine switch and resumption of the vaccine being offered in the country commenced on 17 April 2023. During the switch, the project supported MOH in monitoring and providing supportive supervision in all provinces and districts.

The coverage rate from rotavirus as of 30 September was 89% for dose one, 59% for dose two, and 40% for dose three.

09 REPRODUCTIVE, MATERNAL, NEWBORN, AND CHILD HEALTH

- Advancing Cervical Cancer Screening in HIV Positive Women - Identifying Bottlenecks, Facilitators, and Barriers to Providing Cervical Cancer Care in Zambia
- Comparative Effectiveness of Cervical Cancer Screening Policies in Zambia - A Mathematical Approach
- Diagnostic Test Accuracy of a Mobile Colposcope, HR-HPV Testing, and VIA for Detection of Cervical Intraepithelial Neoplasia, Grade 2 and Above in Women Living with HIV
- Feasibility of Vital Sign Assessment by Community Health Workers during Antenatal Care Community Outreach
- Incidence of Postpartum Depression among Newly Delivered Mothers at the Women and Newborn Hospital in Lusaka, Zambia
- Neonatal Mortality Following KMC Discharge: A Retrospective Cohort Study
- Randomized Controlled Trial of Higher-Volume Feedings in Preterm Neonates
- Understanding the Epidemiology of Trauma-Related Acute Kidney Injury (AKI) in Children and Adolescents for Improved Rapid Detection in Low-resourced Settings

Advancing Cervical Cancer Screening in HIV Positive Women - Identifying Bottlenecks, Facilitators, and Barriers to Providing Cervical Cancer Care in Zambia

Funder:
Swiss National Science Foundation (SNSF)

Time Period:
Feb 2022 -Dec 2023

Cervical cancer is the leading cause of cancer-related deaths among women in Sub-Saharan Africa (SSA). Women living with HIV (WLHIV) are six times more likely to develop cervical cancer than those who are HIV-negative. The Advancing Cervical Cancer Screening in HIV-positive Women (ACCHIVe) project tackled this issue by developing a framework and tools to enhance cervical cancer screening programmes.

The project, implemented in 14 SSA countries, supported current cervical cancer control and monitoring efforts. ACCHIVe developed an evidence-based Cervical Cancer Prevention and Care Cascade (The CCPC Cascade) with a focus on WLHIV. The framework was piloted in Zambia and implemented as a sentinel programme. This real-world application allowed experts to identify gaps in care, providing valuable insights to enhance services. Furthermore, the ACCHIVe project investigated barriers and facilitators to cervical cancer uptake in Zambia. Interviews and surveys were conducted with women in communities and health facilities, including women on ART programmes and women diagnosed with cervical cancer lesions, and with health care providers in the three districts of Lusaka, Chipata, and Lundazi.

Results showed that while women were generally knowledgeable, there was a low awareness of cervical cancer services and misinformation regarding causation and screening procedures, particularly among women who had never been screened. Fear of stigma, procedures, and results were prominent barriers across all categories of women. Women with lesions, particularly from the Eastern districts in Lundazi and Chipata, were most affected by structural and health system barriers. For example, women were expected to pay transport and sample testing costs, which many could not afford. Furthermore, the lack of histopathology services at the laboratory in the Eastern province resulted in delayed or lost histopathology results, impacting women's access to treatment.

The survey also found that screening services were available as routine care, on- or off-site, in two-thirds of the HIV clinics (74%), using mainly visual inspection with acetic acid (83%). HPV testing was used in a few sites (40%) in all regions except Central Africa, with corresponding quality assurance services available except in West Africa. Referral for pre-cancer (40%) and invasive cancer (70%) treatment was common. Women had to pay a fee for these services in about half of the sites (53%). Among sites doing laboratory testing for screening and diagnosis, the majority had result turnaround times varying between one to four weeks (65%). Only about half of the sites received funding for cervical cancer prevention from the Government (43%) and NGOs (43%).

Comparative Effectiveness of Cervical Cancer Screening Policies in Zambia A Mathematical Approach

Funder:
Swiss National Science Foundation (SNSF)

Time Period:
Feb 2023 -Dec 2024

The highest cervical cancer incidence rates worldwide are found in Southern and East African countries such as Eswatini, Malawi, and Zambia. The high cervical cancer burden in these countries is linked to the high HIV prevalence, as WLHIV are more likely to develop cervical disease.

In this study, we seek to review and analyse the existing policy guidelines in Zambia and identify the optimal cervical cancer prevention strategy that can help reduce the incidence and mortality rates of the disease. We are developing a mathematical model that can simulate the lifetimes of a cohort of Zambian women using existing demographic and cervical cancer natural history data and assess the comparative efficacy and cost-effectiveness of different cervical prevention strategies.

Diagnostic Test Accuracy of a Mobile Colposcope, HR-HPV Testing, and VIA for Detection of Cervical Intraepithelial Neoplasia, Grade 2 and Above in Women Living with HIV

Funder:
National Institute of Health, Esther Foundation

Time Period:
Jul 2019 - Dec 2024

The WHO strategy to eliminate cervical cancer aims to improve prevention and treatment among WLHIV. A recommendation has been made based on moderate evidence that individuals at high risk of human papillomavirus (HPV) do an additional screening for HIV. Cervical cancer remains the leading cause of cancer-related death among women in SSA, where more than half of cervical cancer cases are attributed to HIV. Increased life expectancy on ARTs increases the likelihood of persistent HPV infection progressing to cervical pre-cancer and cancer.

A comprehensive evaluation of alternative screening tests among WLHIV, using methods that minimise verification biases, has not yet been conducted. Colposcopy is the cornerstone of visual assessment for cervical cancer screening, used as a second or third test in the screening pathway of high-resource countries. Still, it is rarely accessible in low-resource settings where visual inspection with acetic acid (VIA) are the most used screening tests. However, both have low accuracy, particularly for WLHIV.

The primary objective of this study is to determine the diagnostic test accuracy of the Gynocular™ colposcope and validate the Swede score in a population of WLHIV. The secondary objective is to better understand the dynamics of hrHPV infection and CIN by continuing follow-up to 48 months in our established cohort of WLWH in Zambia.

A total of 376 study participants consented and were screened for cervical cancer. Of these, 27% of women had CIN2+. The combination of hrHPV testing followed by Gynocular™ had the best balance of sensitivity (42.6% [33.4–52.3]) and specificity (89.6% [85.3–92.7]).

Through a secondary analysis, we explored HPV genotype agreement in paired LBC and histopathology samples among the same cohort. Our findings show more multiple-type infections on LBC than histopathology and limited HPV genotype agreement between sample types. This may be partly explained by more frequent transient HPV infections in LBC.

Feasibility of Vital Sign Assessment by Community Health Workers during Antenatal Care Community Outreach

Funder:

Wellcome Trust Flagship Innovations

Time Period:

Aug 2022 - Mar 2024

Continuous vital sign monitoring is a basic tenet of specialised care in the developed world that is vastly underutilised during hospital/clinic admissions or outpatient routine visits in most LMICs. Despite the positive outcomes associated with vital sign monitoring (i.e., increased survival-to-discharge rates, lower complication rates, and shorter length of stay in hospital), the prohibitive costs of conventional patient monitors and the difficulty in maintaining complex medical equipment limit its practice in the developing world.

Wearable health devices (WHDs) are increasingly helping people better monitor their health status at an activity/fitness level for self-health tracking and a medical level, providing more data to healthcare providers to increase the potential for early diagnosis and treatment guidance. Advances in materials science, chemical analysis techniques, equipment design, and manufacturing methods have laid the foundation for the continuous evolution of wearable systems.

Phase one of this pilot feasibility trial will be implemented at the Kanyama General Hospital routine ANC community outreach activities to describe the feasibility, acceptability, ease of use, and perceived confidence of pregnant women and CHWs to use the NeoSpot device during community ANC outreach. Through in-depth interviews (IDIs) conducted among 12 pregnant women and 12 HCWs, the study revealed that pregnant women and CHWs accepted the NeoSpotTM device for its ability to comprehensively assess vital signs, including those not typically assessed at clinics. Additionally, study participants valued its speed, efficiency, and user-friendliness, believing it could reduce waiting times at antenatal clinics.

Phase two of this validation study will be implemented at the University Teaching Hospital among neonates, paediatric population, pregnant women attending ANC services, and non-pregnant adults.

Incidence of Postpartum Depression Among Newly Delivered Mothers at the Women and Newborn Hospital in Lusaka, Zambia

Funder:

University of Alabama at Birmingham (UAB)

Time Period:

Jun 2022 - May 2023

Postpartum depression (PPD) is a serious public health problem affecting 17% of mothers globally, with higher rates recorded in Africa - 40%. PPD is a disorder that commences during the antenatal period up to the first year of an infant's life and is characterized by feelings of worthlessness, fatigue, insomnia, decreased functioning, low mood, and even suicidal thoughts. PPD is also linked with growth retardation, malnutrition, behavioural changes, poor adherence to immunisation schedules, and recurrent infections and hospitalisation. Our overall aim was to determine the incidence of PPD among newly delivered mothers at six to eight weeks postnatal based on required postnatal care of the newborn - NICU, KMC ward, and postnatal ward.

We found that 20.5% of all newly delivered mothers screened positive for PPD at six to eight weeks postnatal. NICU had the highest incidence of PPD (27.8%), followed by the KMC ward (21.3%) and the postnatal ward (12.2%). While 20.5% of all mothers had PPD, mothers whose newborns were admitted to the KMC ward after NICU had a significantly lower rate of PPD (21.3%) compared to those directly discharged home from the NICU (27.8%). These study findings have led us to hypothesize that mothers whose newborns were admitted to the NICU may require further support following NICU discharge where they may bond with their newborn in a safe and conducive environment prior to discharge home – at the KMC ward.

Neonatal Mortality Following Kangaroo Mother Care Discharge: A Retrospective Cohort Study

Funder:

University of Alabama at Birmingham (UAB)

Time Period:

Jun 2022 - May 2023

Globally, 2.3 million newborns die every year, contributing to 47% of under-five child deaths. Approximately 15 million births are preterm, complications from which account for 35% of all neonatal deaths. SSA is among the regions with the highest preterm birth rates, accounting for 60% of the annual figures worldwide. Premature infants are at a greater risk of dying early from serious health conditions such as hypothermia, sepsis, and respiratory and feeding problems. Kangaroo Mother Care (KMC) reduces neonatal mortality and is widely adopted in many LMICs. Our aim is to evaluate the association of weight at KMC discharge and post-discharge mortality among preterm infants.

We conducted a retrospective cohort analysis of KMC admissions between January and December 2022 at the University Teaching Hospitals KMC ward in Lusaka, Zambia. All preterm babies at the NICU ready for stepdown care for further monitoring were transferred to the KMC ward. After hospital discharge, newborns were followed until one year of age. Our aim was to quantify neonatal and post-neonatal mortality following WNH KMC discharge in Lusaka.

While all newborns were stable at hospital discharge, 8.9% died following discharge, 1% within 28 days of life, and 7.9% during the post-neonatal period. Facility-level barriers exist for appropriate implementation of KMC, leading to discharge below the recommended weight limit. Adherence to KMC weight discharge criteria and strengthening of postnatal care, including community KMC, may reduce post-neonatal mortality.

Randomized Controlled Trial of Higher-Volume Feedings in Preterm Neonates

Funder:
Chiesi Foundation

Time Period:
Mar 2018 -Dec 2023

Postnatal growth retardation is a well-described problem in infants in neonatal intensive care units. In one database review of 24,371 neonates discharged, the incidence of extrauterine growth retardation (<10th percentile) was common (28% for weight, 34% for length, and 16% for head circumference).

Current recommended daily intakes (RDI) are to provide nutrients to approximate the rate of growth and composition of weight gain for a normal foetus of the same postconceptional age, which is approximately 10-20 g/kg/day. The primary objective was to evaluate the impact of high Volume (H.V.) feedings using additionally expressed milk (200-240ml/kg/day) versus Usual Volume (U.V.) breastfeeding (120-180 ml/kg/day) on growth velocity from birth to discharge or 40 weeks' PMA, whichever comes first, among very preterm infants.

We enrolled 190 study participants admitted to the KMC ward at the University Teaching Hospitals. There was no difference in growth velocity to 40 weeks' PMA between groups (higher 19.9 g/kg/day versus the usual 20.3 g/kg/day). There was no difference in other growth parameters between groups, including mortality or sepsis. Recorded breast milk volumes during hospitalization differed between groups (mean±SD, 239±47 mL/kg/day versus 189±84 mL/kg/day; $p<0.001$). In this randomised controlled trial, higher volume breastmilk feeding did not improve growth at 40 weeks' PMA in moderate to very preterm infants.

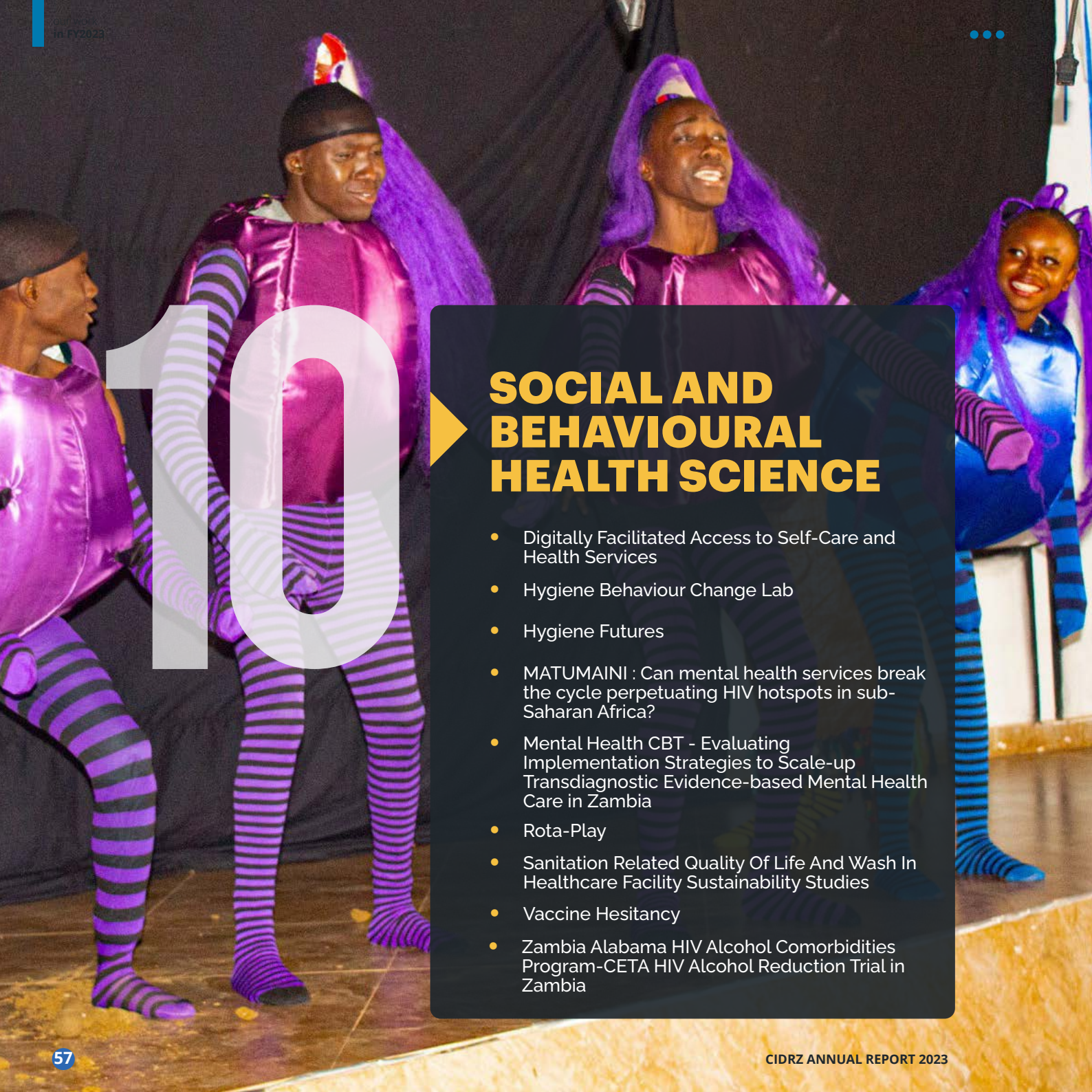
Understanding the Epidemiology of Trauma-Related Acute Kidney Injury in Children and Adolescents for Improved Rapid Detection in Low-resourced Settings

Funder:
University of Alabama at Birmingham (UAB)

Time Period:
Sep 2020 - Sep 2023

The epidemiology, risk factors, and incidence of trauma-related Acute Kidney Injury (AKI) are unknown in Zambia. The current diagnosis for AKI requires expensive laboratory equipment. New point-of-care bedside tests for screening and detecting AKI are available, however, they have not been tested in Zambia. The primary objective was to assess the incidence of trauma-related AKI among a small sample size of paediatric and adolescents admitted to UTH, Lusaka, Zambia, to inform sample size calculations for a larger epidemiological study.

Among the 20 enrolled participants, 16 had AKI (incidence of 80%) by creatinine testing as defined by the Kidney Disease Improving Global Outcomes (KDIGO) method. This study suggests a high rate of AKI goes undetected in trauma patients admitted to UTH. Alternative designs or other funding avenues will need to be secured for a larger, successful epidemiological study.



10

SOCIAL AND BEHAVIOURAL HEALTH SCIENCE

- Digitally Facilitated Access to Self-Care and Health Services
- Hygiene Behaviour Change Lab
- Hygiene Futures
- MATUMAINI : Can mental health services break the cycle perpetuating HIV hotspots in sub-Saharan Africa?
- Mental Health CBT - Evaluating Implementation Strategies to Scale-up Transdiagnostic Evidence-based Mental Health Care in Zambia
- Rota-Play
- Sanitation Related Quality Of Life And Wash In Healthcare Facility Sustainability Studies
- Vaccine Hesitancy
- Zambia Alabama HIV Alcohol Comorbidities Program-CETA HIV Alcohol Reduction Trial in Zambia

Digitally-Facilitated Access to Self-Care and Health Services

Funder:
Bill & Melinda Gates Foundation

Time Period:
Oct 2022 - Apr 2024

This is a mixed methods exploratory study using qualitative and quantitative methods to evaluate and develop community-based testing strategies for HIV, malaria, diabetes, and hypertension in three resource-limited settings across South Africa, Kenya and Zambia. This is a collaboration between University of Washington, CIDRZ, Kenya Medical Research Institute and Human Sciences Research Council. Data has since been collected and the results, which are still being analyzed and reported, have demonstrated that home- and community-based testing models are widely acceptable and feasible among participants, community health workers, and providers.

All qualitative analyses will be completed in mid-December, and three manuscripts are planned. Phase II of the project has been approved, and the protocol is being developed.

Hygiene Behaviour Change Lab

Funder:
Foreign Commonwealth & Development Office, through London School of Hygiene and Tropical Medicine.

Time Period:
Jan 2022 - Dec 2025

The Hygiene Behaviour Change Lab (BC Lab) research project is a collaboration between LSHTM and CIDRZ to address critical questions in the hygiene sector. The project aims to address hand and food hygiene behaviours specifically.

Given the structural complexities in low-resource settings of Zambia, where only 24% of the population has access to a hand washing facility (HWF), gaps remain in the literature around the most appropriate and preferred HWF, their characteristics, and their impact on hand hygiene behaviours. Additionally, food contamination contributes to 40% of all under-five diarrhoeal diseases. However, little is known about the determinants of food hygiene behaviours and the critical contamination and control points for child-weaning foods across LMICs, which are disproportionately affected by childhood diarrhoea morbidity and mortality.

These gaps must be urgently addressed to improve hand-washing behaviours and food hygiene interventions. The BC Lab employs mixed methods research to address key inquiries, including observations, surveys, and food sample laboratory tests. These inquiries include evaluating the acceptability of promising household water treatment and safe storage designs among potential end users, understanding how users adapt existing HWF designs, and determining the necessary behaviour change communication for uptake and maintenance. Additionally, the research investigates the microbiological quality of weaning foods, the behaviours contributing to food contamination, and the determinants of food hygiene behaviours in low-resource settings.

Progress includes collaborative meetings with LSHTM, engagement with local stakeholders, and obtaining ethical protocol approvals. Furthermore, the research has identified eight hand hygiene technologies for exploration in formative research. The outcomes of this research will inform decision-making and action regarding the implementation of appropriate hand and food hygiene interventions at household and community levels, contributing to the well-being of growing children.

Hygiene Futures

Funder:
Foreign, Commonwealth & Development Office

Time Period:
Mar 2023 - Mar 2024

Given the limited evidence on the relationship between water access, availability, security, use, and hygiene behaviours, the Hygiene Futures project collects cross-sectional household data across three types of settlements, all with different water access characteristics in Lusaka and Kafue districts. The project uses a mixed-method approach, including surveys, in-depth interviews, and observations to address the research questions. The findings of this project are expected to contribute to existing knowledge and inform policy and interventions on the suitable methods of improving water services and hygiene practices in similar low-resource settings in SSA.

Since receiving funding, we have developed our study protocols and received approvals from both LSHTM and UNZABREC ethics committees. The study will move on to the data collection and analysis phases Q1 2024.

MATUMAINI : Can Mental Health Services Break the Cycle Perpetuating HIV Hotspots in Sub-Saharan Africa?

Funder:
National Institute of Mental Health

Time Period:
Jul 2022 - Jun 2027

The central hypothesis of this study is that hotspots can be classified into distinct types based on observable properties with different implications for the role of Common Mental Disorders (CMD) screening and treatment in achieving HIV epidemic control. We hypothesise that the incidence-prevalence feedback loop underlying unexplained hotspots or legacy hotspots can be broken by extending HIV prevention and treatment beyond the reach of current programs, including through CMD screening and treatment.

A systematic literature review is currently underway to establish the effect of depression on risky sexual behaviours, HIV prevention, and care cascade outcomes. EMOD is currently being adapted for depression.

Mental Health CBT - Evaluating Implementation Strategies to Scale-up Transdiagnostic Evidence-based Mental Health Care in Zambia

Funder:
National Institute of Mental Health

Time Period:
May 2018 - Feb 2024

This study was initially designed to compare two train-the-trainer implementation strategies of the common elements treatment approach (CETA). CETA is an evidence based therapy that treats multiple common mental health problems such as depression, anxiety and trauma. Due to COVID, the study was redesigned and the aims changed to:

1. To compare the effectiveness of in-person CETA and telephone delivered CETA to Treatment as usual for adolescent and young adult's mental health problems.
2. To compare the effectiveness of telephone CETA to in-person CETA in reducing adolescent mental health symptoms. The preliminary results of the trial are summarized below:

    - In-person CETA and telephone delivered CETA were both more effective in reducing trauma symptoms, internalizing symptoms and externalizing behaviours for adolescents and young adults in the overall sample (n=400).
    - For youths with more significant trauma (n=200), in person CETA was more effective than telephone CETA and treatment as usual.

- Reductions in trauma symptoms for those receiving telephone CETA and with significant trauma, were non-significant compared to treatment as usual.
- In person and telephone CETA were both superior to treatment as usual in reducing internalizing symptoms and externalizing behaviours compared to treatment as usual among adolescents with more significant symptoms.

This study reveals that telephone delivered counselling services offer a viable alternative to traditional in-person counselling, ensuring comparable effectiveness in addressing mental health concerns, thus expanding accessibility and convenience for adolescents and young adults seeking support.

Funder:

Wellcome Trust through Amsterdam Institute for Global Health and Development

Time Period:

Aug 2022 - Apr 2025

Rota-Play

This is a before and after experimental study that aims to assess gains in knowledge and awareness on antimicrobial resistance among caregivers engaged to watch a pupil led theatre performance. In the last year, the project completed the formative research using in-depth interviews that informed the development of a creative brief, leading to the creation of a pupil-led theatre play called "Germ World." The development of the play was led by Tsungai Garise, a local Creative Consultant and Theatre Director who worked closely with the CIDRZ and Amsterdam University research teams and Bauleni Special Needs School administrative staff. After script writing, review, translation, auditions, and rehearsals, in August 2023 "Germ World" was performed to parents and their children under five. The findings from this research will highlight the effect of using innovative engagement strategies in communicating complex but important topics impacting public health.

Sanitation Related Quality Of Life And Wash In Healthcare Facility Sustainability Studies

Funder:

World Vision USA

Time Period:

Oct 2020 - Sep 2023

Measurement of WASH indicators has focused on the health benefits of improvement without exploring the non-health benefits that can also contribute to improved standards. It's important to understand how much value users place on sanitation to address the non-health benefits of WASH.

This research has identified attributes of Sanitation Quality of Life (SanQol) in rural settings, explored the validity of the existing SanQoL measures, and assessed distributions of SanQoL index values for different levels of sanitation service in rural areas. Additionally, data on the World Vision Zambia-led Community Voice in Action (CVA) programme has been collected to understand the potential of this initiative in advancing WASH in the Health care agenda.

This study took place in rural areas within two World Vision Zambia Area Programmes near Lusaka to provide a rural complement to previous urban research. This is a mixed-method study using in-depth interviews and surveys. All data has been completed and is currently being analysed.

Funder:
Johnson and Johnson Foundation Scotland

Time Period:
Jan 2022 - Dec 2023

Vaccine Hesitancy

This research aimed to understand COVID-19 vaccine perceptions, as well as those of other soon-to-be-introduced vaccines like TB, HIV, and malaria. We also evaluated preferences for COVID-19 vaccination delivery to make it easier for those who want to be vaccinated.

The study recruited 100 HCWs and volunteers across 24 facilities in Lusaka Province and 400 people in the surrounding communities, including caregivers to children under 18. We had a mix of unvaccinated, partially vaccinated, fully vaccinated, and individuals fully vaccinated with a booster. The study team is still collecting data.

Zambia Alabama HIV Alcohol Comorbidities Program-CETA HIV Alcohol Reduction Trial in Zambia

Funder:
National Institute of Health

Time Period:
Sep 2021 - Aug 2024

Unhealthy alcohol use is a broad term that comprises heavy and hazardous alcohol use, heavy episodic drinking (i.e., binge drinking), alcohol use disorders, and dependence. The purpose of this research is to evaluate an alcohol Brief Intervention (BI) alone and with referral to the Common Elements Treatment Approach (CETA) when delivered to adults with HIV and unhealthy alcohol use at public sector facilities in Zambia. Our central hypothesis is that an alcohol BI plus referral to CETA will be superior to both BI alone and the standard of care in improving HIV and alcohol use outcomes.

CIDRZ will test this hypothesis and generate information for the potential scale-up of these programs in Zambia and the wider region. Results will also be used to inform translation of the interventions for HIV clinics in the USA. This research will generate information on the overlapping nature of comorbidities in people with HIV, which may independently alter HIV outcomes and reduce quality of life.

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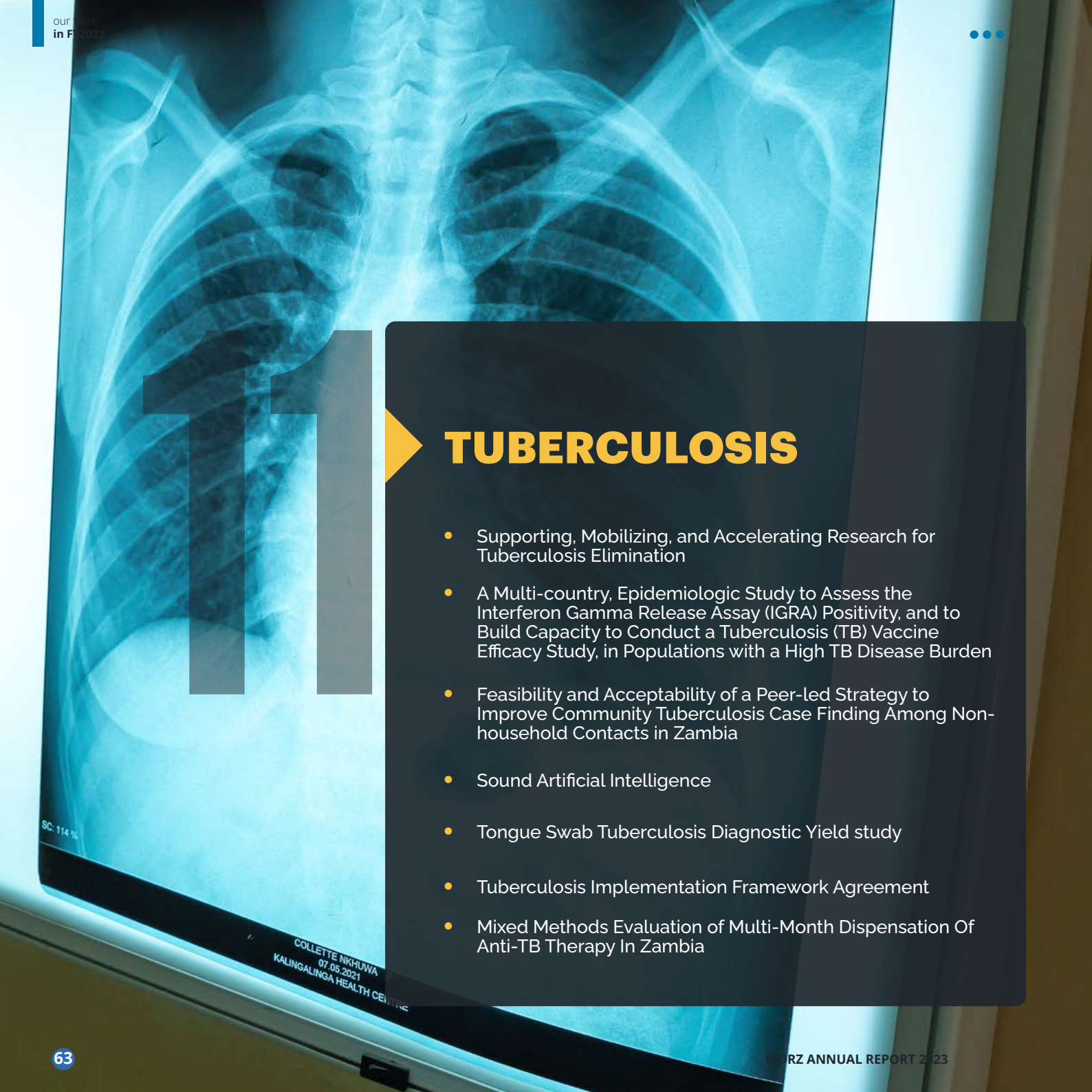

11 TUBERCULOSIS

- Supporting, Mobilizing, and Accelerating Research for Tuberculosis Elimination
- A Multi-country, Epidemiologic Study to Assess the Interferon Gamma Release Assay (IGRA) Positivity, and to Build Capacity to Conduct a Tuberculosis (TB) Vaccine Efficacy Study, in Populations with a High TB Disease Burden
- Feasibility and Acceptability of a Peer-led Strategy to Improve Community Tuberculosis Case Finding Among Non-household Contacts in Zambia
- Sound Artificial Intelligence
- Tongue Swab Tuberculosis Diagnostic Yield study
- Tuberculosis Implementation Framework Agreement
- Mixed Methods Evaluation of Multi-Month Dispensation Of Anti-TB Therapy In Zambia

Supporting, Mobilizing, and Accelerating Research for Tuberculosis Elimination

Funder:
University of California, San Francisco / USAID

Time Period:
Aug 2023 - Mar 2024

Supporting, Mobilizing, and Accelerating Research for Tuberculosis (SMART) Elimination is an initiative made possible by USAID. The SMART4TB Consortium brings together experts in TB tool development, implementation science, capacity strengthening, civil society engagement, and policy translation. Consortium partners led by Johns Hopkins University include the Elizabeth Glaser Paediatric AIDS Foundation, KNCV Tuberculosis Foundation, Treatment Action Group, and the University of California, San Francisco.
In year one, the Assessing Diagnostics at Point-of-Care for Tuberculosis (ADAPT) study is evaluating tongue swabs for TB testing using Xpert MTB RIF and TrueNat platforms. To date, we have obtained all local regulatory approvals, staff training, and procurement of equipment.

A Multi-country, Epidemiologic Study to Assess the Interferon Gamma Release Assay (IGRA) Positivity, and to Build Capacity to Conduct a Tuberculosis (TB) Vaccine Efficacy Study, in Populations with a High TB Disease Burden

Funder:
Bill and Melinda Gates Medical Research Institute

Time Period:
Feb 2022 - Sep 2024

The primary purpose of this epidemiological study is to assess Interferon Gamma Release Assay (IGRA) positivity at each site and pinpoint sites with populations at high risk of Mtb infection. This evaluation will help refine the sample size and duration required for the planned Phase 3 study. Furthermore, it will prepare sites for study participant recruitment, follow-up, retention, and biological sample processing procedures, thereby enhancing their capacity to generate quality clinical trial data and increasing the success of the Phase 3 efficacy trial. During the initial three-month recruitment window, 160 participants (target) were successfully enrolled after an initial eligibility screening of 174 individuals, however, six participants have withdrawn from the study. Regrettably, two participants have passed away, and one is lost to follow-up.
The study has had two remote and two physical monitoring visits and one audit. All had no major findings. Throughout the two- and half-year follow-up period, there will be two remote visits per month and six-monthly physical visits.

Funder:
National Institute of Health

Time Period:
Jul 2021 - Jun 2026

Feasibility and Acceptability of a Peer-led Strategy to Improve Community Tuberculosis Case Finding Among Non-household Contacts in Zambia

This study examines the feasibility and acceptability of a peer-led strategy to improve community TB case finding among non-household contacts in Zambia. We have completed data collection for Phase 1 and await a sub-award for Phase 2. This award is expected to be given in the first quarter of FY24.

Sound Artificial Intelligence

Funder:
EPSRC Impact Acceleration Account (IAA) and Higher Education Innovation Fund (HEIF)

Time Period:
Mar 2023 - Dec 2024

The project successfully completed the data collection phase and knowledge-sharing activities. The study recruited a total of 501 out of a targeted 550 participants. We conducted exchange visits with the University of Sheffield, which facilitated mutual exchange of knowledge and skills. The Sheffield team provided crucial assistance during the study setup, and the CIDRZ team provided input for data analysis. Currently, our focus is data cleaning and training the AI model. Preliminary results from the AI are promising, showing a 70% sensitivity and specificity in TB screening.

Tongue Swab Tuberculosis Diagnostic Yield study

Funder:
Bill & Melinda Gates Foundation

Time Period:
May 2023 - May 2024

TB diagnosis is the most significant gap in the global TB cascade of care. Tongue swabs offer a promising alternative with easier, less invasive collection. This grant aims to collect initial data on usability and acceptability and measure the diagnostic yield of a tongue swab test versus sputum-based tests. This will help determine where tongue swabs fit into the TB diagnostic landscape and if the reduced sensitivity can be overcome by increased access.

We plan to compare the diagnostic yield of tongue swabs- versus sputum-based molecular testing for TB among people of all ages presenting to primary health centres and identified as having presumptive TB. The study plans to recruit a total of 1,300 participants who are defined as presumptive TB cases within routine services at three facilities (George, Nakachenge, and Ngwerere health centres) over a duration of 8-12 months. To date, the study has recruited 411 participants who were offered a tongue swab in addition to routine sputum samples. These samples are tested on GeneXpert (swabs and sputum) and TrueNat MTB+ (swabs). Qualitative data collection commenced with 19 in-depth interviews (IDI) and best-worst scale (BWS) exercises conducted among healthcare workers, caregivers, and patients to understand the preferences for either tongue swabs or sputum sample collection for TB diagnosis.

Tuberculosis Implementation Framework Agreement

Funder:
JSI Research and Training Institute, Inc

Time Period:
Apr 2023 - Dec 2023

Zambia remains among the 30 high TB burdened countries, and although we continue to notify over 50,000 new and relapse cases annually, the country does not have enough diagnostic facilities to meet the demand. Nationwide in 2021, we only had 53 functional analogue X-ray machines and 13 digital X-ray machines. The Tuberculosis Implementation Framework Agreement (TIFA) aims to increase access to chest X-rays to accelerate TB detection through radiological screening among presumptive TB patients.

We have reached significant project milestones, including conducting site assessments in eight districts across four provinces and selecting four health facilities. Renovations were completed at three out of four facilities to meet radiation protection authority (RPA) standards. Import permits were secured for all four X-ray units to be procured. Additionally, we received supplementary funding from JSI to acquire lead doors and windows for the renovated facilities. The remaining project activities are contingent upon the arrival of the X-ray units, which are being procured by the funder.

Mixed Methods Evaluation of Multi-Month Dispensation Of Anti-TB Therapy In Zambia

Funder:
The Center for Disease Control and Prevention

Time Period:
Oct 2020 - Sep 2025

Within global HIV programmes, DSD models, including MMD for ARTs, have been the standard of care for several years. However, TB treatment programmes have been slow to adopt MMD, given the long precedent of directly observed therapy for TB treatment. COVID-19 increased interest in MMD for TB treatment as efforts were made to minimize the number of patients presenting to health facilities for non-urgent care. However, Zambia's National Tuberculosis and Leprosy Programme (NTLP) was one of the earliest adopters globally, releasing guidelines in March 2020 that supported MMD for TB treatment.

While the rationale underpinning MMD has been supported by evidence from HIV treatment programs in sub-Saharan Africa (SSA), a rigorous description of MMD for TB, including its effect on TB treatment outcomes, reach among TB patients within TB programmes, and its impact on other key implementation outcomes is currently unavailable. To address this knowledge gap, under TB MEDZ, we aim to characterize MMD for TB treatment and its variations in Zambia and assess their reach across and within sampled health facilities; describe trends in TB outcomes within sampled facilities over the past four years, and estimate the comparative impact of TB MMD and variations of MMD against each other and versus the standard of care according to routinely collected TB outcomes, as well as selected health service outcomes; and assess the perspectives of TB patients and NTLP staff, including professional and lay health workers, on the facilitators and barriers of MMD delivery and the potential to sustain and scale up MMD.

We will complete these objectives by conducting a mixed methods evaluation incorporating both qualitative and quantitative data collection involving routine NTLP data. To date, we have completed a programmatic mapping exercise to understand the scope of MMD reach and variations on MMD implementation in four selected facilities in Lusaka and have developed an evaluation protocol with colleagues in NTLP and CDC that is currently undergoing regulatory review.

Once launched, this formal evaluation of TB MMD in Zambia will provide critical information to the NTLP, MOH, and CDC as they consider the long-term sustainability and scalability of MMD for TB in Zambia and other countries considering implementation of DSD models to enhance TB treatment and care.

CIDRZ PARTNERSHIPS

CIDRZ works closely with the Government of the Republic of Zambia, and local and global donor and research organizations to improve the health outcomes of Zambians. Our valued partners include:

ZAMBIAN GOVERNMENT

- Ministry of Chiefs and Traditional Affairs
- Ministry of Community Development and Social Welfare
- Ministry of General Education
- Ministry of Health
- Ministry of Home Affairs
- Ministry of Local Government and Housing

- Cancer Diseases Hospitals
- National HIV/AIDS/STI/TB Council
- National TB and Leprosy Control Program
- University Teaching Hospitals
- Zambia Correctional Service

GOVERNMENT DONORS

- The U.S. President's Emergency Plan for AIDS Relief (PEPFAR)
- Center for Disease Control and Prevention (CDC)
- National Institute of Health
- National Institute of Mental Health (NIMH)
- National Heart, Lung, Blood Institute (NHLBI)
- United States Agency for International Development (USAID)

- European & Developing Countries Clinical Trials Partnership
- Foreign Commonwealth & Development Office
- Medical Research Council
- Wellcome Trust

INTERNATIONAL BODIES

- The Global Fund to Fight AIDS, Tuberculosis and Malaria
- UNICEF
- World Health Organization
- World Vision

INDUSTRY/ RESEARCH:

- Delft Imaging
- DesireLine
- DIGNITY
- EPSRC Impact Acceleration Account (IAA) and Higher Education Innovation Fund (HEIF)
- JSI Research and Training Institute
- Gavi, The Vaccine Alliance
- PACT
- PATH
- PPD Global Limited
- VillageReach

FOUNDATIONS:

- AIDSFond
- Bill & Melinda Gates Foundation
- Chiesi Foundation
- The ELMA Foundation
- The ELMA Vaccines and Immunisation Foundation
- Erasmus MC
- Esther Foundation
- The Fleming Fund
- The Leona M and Harry B Helmsley Charitable Trust
- Johnson and Johnson Foundation
- M.A.C AIDS Fund
- Mott MacDonald Foundation
- Swiss National Science Foundation

UNIVERSITIES

- Amsterdam Institute for Global Health and Development (AIGHD), Netherlands
- Columbia University, USA
- Fred Hutchinson Cancer Research Center, USA
- Harvard University, USA
- Imperial College of Science, Technology and Medicine, United Kingdom
- Johns Hopkins University, USA
- London School of Hygiene and Tropical Medicine, United Kingdom
- New York University, USA
- Research Center Borstel- Leibniz Lung Center (RCB)
- Stellenbosch University, South Africa
- Swiss Tropical and Public Health Institute, Switzerland
- University of Alabama at Birmingham, USA
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- University of Sussex, United Kingdom
- University of the Free State, South Africa
- University of Zambia, Zambia
- Vanderbilt University, USA
- Washington University, USA
- Yale University, USA

PUBLICATIONS

Authors from CIDRZ are highlighted in blue on the publications list.

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FINANCIALS

* *Full Financial Statements are available at cidrz.org or by request.*

CONSOLIDATED STATEMENT OF INCOME AND EXPENDITURE AND OTHER COMPREHENSIVE INCOME

	2023 Kwacha	2022 Kwacha
Programme income	**990,657,195**	987,767,259
Programme expenses	**(879,159,530)**	(835,521,660)
Operating surplus	**111,497,665**	152,245,599
Administrative expenses	**(219,869,565)**	(241,474,369)
Other income	**44,790,226**	78,001,265
Results from operating activities	**(63,581,674)**	(11,227,504)
Finance costs	**(409,738)**	-
Finance income (expense)	**32,673,551**	3,273,755
Deficit for the year	**(31,317,861)**	(7,953,750)
Tax (expense) credit	**(982,695)**	23,714
Deficit for the year after tax	**(32,300,556)**	(7,930,036)
Items that will not be reclassified subsequently to profit or loss		
Amortisation of revaluation surplus	**345,316**	345,316
Total comprehensive loss for the year	**(31,955,240)**	(7,584,720)

CONSOLIDATED STATEMENT OF FINANCIAL POSITION AS AT 30 SEPTEMBER 2023

	2023 Kwacha	2022 Kwacha
ASSETS		Restated
Non-current assets		
Property, plant and equipment	**150,785,652**	96,909,731
Right of use assets	**3,743,149**	-
Investment in subsidiary	**-**	-
Deferred tax asset	**-**	340,451
	154,528,801	97,250,182
Current assets		
Inventories	**11,115,890**	12,866,114
Trade and other receivables	**157,215,459**	93,912,937
Financial assets – Held to maturity	**1,983,317**	5,993,297
Cash and cash equivalents		
-Restricted	**224,901,546**	117,376,089
-Un-Restricted	**20,228,801**	15,206,425
	415,445,013	245,354,862
TOTAL ASSETS	**569,973,814**	342,605,044
Reserves and grants		
Revenue reserves	**103,569,665**	135,524,905
Capital grant	**26,377,699**	28,745,723
Revaluation reserve	**9,441,258**	9,786,574
Total equity	**139,388,622**	174,057,202
Liabilities		
Non-current liabilities		
Lease liabilities	**2,282,272**	-
	2,282,272	-

CONSOLIDATED STATEMENT OF FINANCIAL POSITION AS AT 30 SEPTEMBER 2023

	2023 Kwacha	2022 Kwacha
ASSETS		Restated
Current liabilities		
Deferred income	**263,431,221**	95,661,976
Trade and other payables	**163,619,859**	72,613,323
Lease liabilities	**754,109**	-
Income tax payable	**82,016**	272,543
Deferred tax liability	**415,715**	–
	428,302,920	168,547,842
TOTAL LIABILITIES	**428,302,920**	168,547,842
TOTAL EQUITY AND LIABILITIES	**569,973,814**	342,605,044

CONSOLIDATED STATEMENT OF CASH FLOWS FOR THE YEAR ENDED 30 SEPTEMBER 2023

	2023 Kwacha	2022 Kwacha
CASH FLOWS FROM OPERATING ACTIVITIES		
Deficit for the year	**(31,317,861)**	(7,953,750)
Adjustments for:		
Depreciation of property, plant and equipment	**18,765,387**	16,436,800
Depreciation of right-of-use assets	**863,804**	-
Impairment charge (reversals) of trade receivables	**6,955,565**	(3,388,052)
Interest income	**(1,033,088)**	(3,232,351)
Finance costs	**409,738**	-
Amortisation of project grant	**(2,368,024)**	(44,431)
Loss on disposal of property and equipment	**5,653,088**	1,494,713

CONSOLIDATED STATEMENT OF CASH FLOWS FOR THE YEAR ENDED 30 SEPTEMBER 2023

	2023 Kwacha	2022 Kwacha
Net exchange (gains) losses	(31,640,463)	41,403
Net cashflows from operations before tax	(33,711,854)	3,354,332
Income tax paid	(417,056)	(191,463)
	(34,128,910)	3,162,869
Changes in working capital		
Decrease (increase) in inventories	1,750,224	(6,419,908)
(Increase) decrease in trade and other receivables	(70,258,087)	4,237,236
Increase (decrease) in deferred income	167,769,245	(35,280,308)
Increase (decrease) in trade and other payables	91,006,536	10,414,020
Net cash (utilised) generated in operating activities	156,139,008	(23,886,091)
CASH FLOWS FROM FINANCING ACTIVITIES		
Repayment of lease liabilities	(930,279)	-
CASH FLOWS FROM INVESTING ACTIVITIES		
Interest received	1,033,088	3,232,351
Cash received from maturity of financial instruments	4,009,980	18,499,557
Purchase of right of use asset (Company contribution)	(1,050,031)	-
Proceeds of disposal	6,180,000	-
Purchase of property and equipment	(84,474,396)	(43,765,662)
Net cash generated (used) in investing activities	(74,301,359)	(22,033,754)
Net (decrease) increase in cash and cash equivalents	80,907,370	(45,919,845)
Cash and cash equivalents at 1 October 2022	132,582,514	178,543,761
Exchange differences	31,640,463	(41,403)
Cash and cash equivalents at 30 September 2023	245,130,347	132,582,514

PROGRAMME INCOME

Programme Income	2023 Kwacha	2022 Kwacha
PROUD Z	**199,669,623**	177,099,708
USAID SDHP	**190,992,112**	146,277,733
USAID TB LON	**184,132,582**	96,848,713
LIFE	**143,058,132**	166,307,643
USAID ECAP III	**73,885,414**	91,436,615
CDS third round	**51,347,877**	-
CoVPN 3008 Protocol Funding	**20,331,882**	11,323,583
Non-Replicating Rotavirus Study	**15,211,555**	23,357,230
NIH TASKPEN Project	**14,698,445**	15,620,496
MENTAL HEALTH CBT	**13,294,090**	12,790,427
DSD SI	**10,824,099**	9,993,572
leDEA	**10,060,440**	12,684,861
ZAM AMR	**9,963,311**	15,186,366
ZIH- FAA 1	**9,391,258**	-
Google health AI	**8,918,311**	10,718,001
PEN-Plus Project	**8,817,260**	5,495,538
SHIGORA VAX	**6,006,295**	4,858,866
ETVAX PROJECT	**5,211,834**	-
VMMC NEXUS	**3,123,747**	11,929,420
OTHER PROJECTS	**11,718,928**	175,838,487
	990,657,195	987,767,259

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