Ministry of Health

National Health Research

Conference Abstracts Booklet

10th Zambia Health Research Conference 2022

Public Health Emergencies: Leveraging Research and Scientific Innovations to Prevent Future Pandemics and Other Public Health Threats - Lusaka, Zambia 2022

Prepared by: National Health Research Authority

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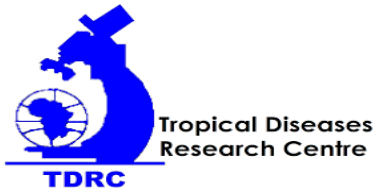
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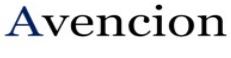
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Acknowledgements

The National Health Research Authority wishes to extend their heartfelt gratitude to all those who played a pivotal role in the preparation and successful hosting of the 10th Zambia Health Research Conference. I sincerely thank the conference sponsors, exhibitors, keynote and expert speakers, the secretariate team and the entire research community through whom the collective efforts helped in ensuring the conference was made possible. The booklet was compiled by the conference secretariate with support from members of the conference scientific committee.

I wish to acknowledge and give thanks to the Scientific Committee under the distinguished leadership of Professor Esther Munalula-Nkandu who chaired the committee with her vice-chairperson Dr. Sebastian Hachizovu. My appreciation extends to the dedicated abstract reviewers from various disciplines, some of whom outdid themselves and reviewed extra abstracts in situations where some reviewers failed to meet their review obligations. To each of those reviewers who were not members of the scientific committee, we offer our heartfelt thanks for their exceptional work to the review process.

Special thanks go to all authors, both at individual and institutional levels, for making the effort to prepare, submit and ultimately present their abstracts at the conference.

Last, but not the least, I wish to thank the conference managers, and the entire secretariat team for the meticulous planning, abstract management, communication to abstract authors, coordination of the conference program and ensuring that abstract authors present their work during the conference.

However, it is important to note that the abstract management, review and booklet compilation process was not without challenges. For example, some abstracts in this booklet do not have superscripts to indicate the authors' institution affiliations, despite numerous efforts made by secretariat to collect this information. It is therefore because of such challenges that the compilation and release of this booklet has been delayed. Nevertheless, regardless of all challenges, the scientific committee and the secretariat now share with the general public, this abstract book for the 10th Zambia Health Research Conference for 2022.

Sandra Chilengi-Sakala

Deputy Director-Research Coordination, Capacity Building & Knowledge Translation

National Health Research Authority

Foreword

Zambia proudly hosted the 10th Zambia Health Research Conference (ZHRC) from the 19th to the 21st of October 2022 at the Mulungushi International Conference Centre in Lusaka. The conference, held under the theme "*Public Health Emergencies: Leveraging Research and Scientific Innovations to Prevent Future Pandemics and other Public Health Threats,*" had 7 sub-themes in which a total of 166 abstracts were received. A total of 146 abstracts were accepted, of which 102 were oral presentations and 44 were poster presentations. Notably, we received submissions across all 7 subthemes as indicated in the booklet, with the highest number of accepted abstracts coming from the subtheme; "Other (Including Other Public Health Threats)" with 39 abstracts accepted, while subtheme; "Harnessing the power of Public-Private-Partnerships (PPPs) in Health Systems during pandemics" had the lowest number of accepted abstracts with 3 accepted abstracts. These abstracts were submitted either as scientific or as best practice abstracts.

We are pleased to report that we had a substantial number of reviewers from various disciplines, who reviewed and scored the abstracts assigned with uttermost commitment.

The accepted abstracts were arranged and listed by sub-themes and in different sessions of the conference scientific program. The conference attracted over 600 participants, including international delegates from 15 countries, to whom the presentations were delivered. These participants comprised researchers, experts, policymakers, business leaders, and health managers. The conference took a hybrid format that combined physical and virtual participation to reach a broader audience.

It is my wish, that this abstract booklet will be read not only by those who attended the 10th ZHRC, but by many other people across the continent and the scientific evidence will contribute to informing policy and decision making. In closing, I encourage all of us scientists and researchers to remain dedicated and committed to generation of scientific evince for the advancement of healthcare systems for better health outcomes for the general population.

Prof. Chalwe Victor

Acting Director and Chief Executive Officer

National Health Research Authority

ABSTRACTS

ANTIMICROBIAL RESISTANCE AND AVERTING THE NEXT PANDEMICS THROUGH THE USE OF GENOMICS

1. WHOLE-GENOME SEQUENCING REVEALS RECENT TRANSMISSION OF MULTIDRUG-RESISTANT MYCOBACTERIUM TUBERCULOSIS CAS1-KILI STRAINS IN LUSAKA, ZAMBIA

Scientific Abstract (Oral)

Chizimu, J[1, 2], Solo, E[3], Bwalya, P[1, 3] ,Tanomsridachchai W[1], Chambaro, H[4,5],. Shawa,M., [6,7] Kapalamula,TF[1]., Lungu,P[8],. Fukushima, Y[1]., Mukonka, V[2]., Thapa, J[1]., Nakajima, C[1,9] and Suzuki, Y[1,9]

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Introduction

Globally, tuberculosis (TB) is a major cause of death due to antimicrobial resistance. In Zambia, like many other developing countries, TB is the leading cause of death especially among people living with HIV/AIDS. Mycobacterium tuberculosis, the cause of TB, has seven major human-adapted lineages which varies in virulence, drug-resistance acquisition and geographical distribution. One of these is lineage 3 (L3) which is predominant in East Africa, the Middle East and South Asia. Mycobacterium tuberculosis CAS1-Kili strains that belong to lineage 3 (Central Asian Strain, CAS) were previously implicated in the spread of multidrug-resistant (MDR)-TB in Lusaka, Zambia. The study set out to

investigate recent transmission of the Mycobacterium tuberculosis MDR CAS1-Kili strains by whole-genome sequencing (WGS).

Methods

We used strains from the previous study conducted in Lusaka from 2013 to 2017 (Chizimu et al., 2021). In the previous study, 87 MDR-TB strains were typed by traditional methods spoligotyping and 24-loci MIRU-VNTR, of which 25 CAS1-Kili strains formed the largest clonal cluster and were suspected to represent a recent transmission event. Hence, all CAS1-Kili strains were subjected to WGS though only 13 were successfully sequenced with Illumina MiSeq platform. The generated raw reads were analyzed using various bioinformatic pipelines. Further, a total 527 global strains were considered for phylogenic assessment of sub-lineage SIT21/CAS1-Kili.

Results

A total of 92% (11/12) of isolates belonged to a cluster (≤12 SNPs) while 50% (6/12) were involved in recent transmission events, as they differed by ≤5 SNPs. All the isolates had KatG Ser315Thr (isoniazid resistance), EmbB Met306 substitutions (ethambutol resistance) and several kinds of rpoB mutations (rifampicin resistance). WGS revealed not only major drug-resistance associated mutations but also novel compensatory variants in rpoB (Thr1047Ile), and rpoC (Trp105Arg) for rpoB Asp435 deletion mutation, and embA (-35A > del) for embB Met306Ile. Several strains shared the same combinations of drug-resistance-associated mutations indicating the clonal spread of MDR strains. It also facilitated the illustration of sequential acquisition and accumulation of drug-resistant mutations on the phylogenetic tree indicating transmission of MDR strains. Despite some reports indicating the reduced fitness as a result of drug resistance evolution, strains in this study showed emanating high fitness strains with preserved ability to spread. Further, Zambian strains belonged to the same clade as Tanzanian, Malawian and European strains, although most of those from other countries were pan-drug-susceptible. Hence, this suggested possible relations among these strains.

Conclusion

The study revealed ongoing transmission of MDR SIT21/CAS1-Kili strains in Lusaka, Zambia, which is a public health concern and needs more evaluation. Additionally, complimentary use of WGS to traditional epidemiological methods provides an in-depth insight on transmission and drug resistance patterns which can guide targeted control measures to stop the spread of MDR-TB.

2. EXAMINING THE ASSOCIATION OF MOLECULAR BASED MALARIA DIAGNOSIS WITH SELF REPORTED MALARIA SYMPTOMS IN LOW TRANSMISSION SETTINGS.

Scientific Abstract (Poster)

Mwaanga,P[1], Matoba,J[1], Schue,J [2]Johns, Hamapumbu, H[1], Musonda, M[1], Katowa, B[1], Lubinda, M[1],Kobayashi, T[1],Simulundu,E[1], Stevenson, J.C[2], Thuma, P.E[1], and Moss.W.J[2].

[1]Macha Research Trust, Macha Research Trust

[2]Johns Hopkins Bloomberg School of public health Macha

Introduction

Zambia National Malaria Elimination Strategic Plan recommends rapid diagnostic tests (RDTs) as the primary diagnostic and microscopy in the absence of RDTs. In a pre-elimination setting, molecular diagnostic techniques are a better option due to low parasite levels. We compared quantitative polymerase chain reaction (qPCR) results with self-reported malaria symptoms and demonstrated the value of qPCR as a malaria diagnostic tool in low transmission settings.

Methods

As part of a longitudinal community-based study in Macha Hospital catchment in Choma District, Southern Province of Zambia from 2015 to 2017, malaria index cases, index household members, and neighbors were tested for malaria by RDT and dried blood spots were collected for testing by qPCR. This analysis was restricted to the first visit of all RDT negative participants. R statistical software was used to calculate age adjusted odds of PCR-positive individuals reporting malaria like symptoms including headache, fever, chills, cough, diarrhea, and nausea/vomitting.

Results

A total of 5,133 samples were collected from 842 households. 134 (2.61 %) were positive for P. falciparum by qPCR and negative by RDT and 65% of these were in index case's household. qPCR positive individuals were more likely to report at least one malaria symptom in the two weeks before DBS collection (OR: 3.15 [95% CI: 2.13, 4.65]). Age adjusted odds ratios (OR) for all malaria

symptoms excluding cough were significantly associated with qPCR positivity. Nausea/vomiting had the highest OR of 8.03 (95% CI: 5.17, 12.47).

Conclusion

Our findings refute assumptions that low levels of parasites only detected by molecular techniques are asymptomatic and the high number of qPCR positive individuals in index households justifies focalized interventions in these households.

3. ANTIMICROBIAL SUSCEPTIBILITY AND GENOMIC PROFILING OF SALMONELLA ENTERICA FROM BLOODSTREAM INFECTIONS AT A TERTIARY REFERRAL HOSPITAL IN LUSAKA, ZAMBIA, 2018-2019

Scientific Abstract (Oral)

Chaponda, E.B[1]., Mharakurwa, S[2]., Michelo, C[3]., Bruce, J[3]., Chandramohan, D[3], and Chico, R.M[3].

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Introduction

Salmonella infections cause a huge burden of illness worldwide, estimated at 3.4 million cases and over 600,000 deaths annually, this has been worsened by the rise in antimicrobial-resistant pathogens that limit treatment options and contribute significantly to the global public health and economic burden. This study investigated antimicrobial susceptibility and genomic profiling of *S. enterica* isolated from bloodstream infections at the University Teaching hospital in Lusaka, Zambia, from January 2018 to December 2019.

Methods

Prospective hospital-based study involving routine blood culture samples submitted to the microbiology laboratory. Conventional microbiology and Kirby-Bauer disc diffusion methods were used to identify *S. enterica* and determine the antimicrobial susceptibility profiles, respectively. Whole genome sequencing (WGS) was performed using Illumina NextSeq (Illumina, San Diego, California, USA) next-generation sequencing technology. Raw genomic sequencing data was assembled using SPAdes Software (version 3.15). Assembled data were analyzed using online bioinformatics pipelines at the Center for Genomic Epidemiology, Denmark (http://www.genomicepidemiology.org/services/). These pipelines included: 'KmerFinder 3.2' for species identification, 'MLST 2.0' for the determination of MLST profile, and 'ResFinder 4.1' for identifying antimicrobial resistance determinants. *Salmonella* serovar determination was performed using the online bioinformatics pipeline 'SeqSero2 version 1.1.0. EnteroBase web-based platform (http://enterobase.warwick.ac.uk/species/index/senterica) was used for serotype and MLST confirmation using 'cgMLST V2 + HierCC V1' scheme and genomic comparison of isolates based on core-genome multilocus sequence typing (cgMLST) data.

Results

Salmonella Typhi (72%) was the most prevalent serovar. Of note was resistance to cephalosporins (4%), ciprofloxacin (5%), multidrug resistance (46%), and reduced susceptibility to ciprofloxacin (30%) and imipenem (3%). The distribution of the MLST serotypes (STs) was as follows; *S.* Typhi: ST1 (n=44) and ST2 (n=2), *S.* Enteritidis: ST11 (n=3) and ST366 (n=3), *S.* Typhimurium ST313 (n=2), *S.* Paratyphi A: ST85 (n=1), *S.* Heidelberg: ST15 (n=3), *S.* Weltevreden: ST365 (n=1). Phylogenetic cluster analysis showed multiple *Salmonella* serovars with a wide range of genetic diversity.

Conclusion

The occurrence of the novel *S.* Typhimurium ST313 that is associated with HIV infection, malaria, severe anaemia, and malnutrition and known to cause invasive disease in Sub Saharan African countries, warrants for improved diagnosis as most *S.* Typhimurium isolates are multidrug-resistant, thereby compromising clinical treatment. The genetic diversity of *Salmonella* Typhi, high prevalence of multidrug resistance, and the emergence of ciprofloxacin and cephalosporin resistance warrants

improved hygiene, water and sanitation provision, continued surveillance to apprise antibiograms and the introduction of the typhoid conjugate vaccine.

4. OPTIMISATION OF ANTIMICROBIAL USE IN BLOODSTREAM AND URINARY TRACT INFECTIONS IN ZAMBIA: KNOWLEDGE, ATTITUDE AND PRACTICE ASSESSMENT AMONG KEY ANTIMICROBIAL STEWARDSHIP STAKEHOLDERS

Scientific Abstract (Poster)

Mwenge, L[1]., Malandu, M. I[1]., Tembo, J[1]., Mulenga, N[1]., Kapolowe, K[1]., Chirwa, U[1]., Katya, M[1]., Siulanda, M[1]., Chanda, R[1]., and Chanda, D[1].

[1]The University Teaching Hospital (UTH)

Introduction

Antimicrobial resistance (AMR) is a global concern and a serious risk to public health; urinary tract infections and blood stream infections are clinical syndromes associated with indiscriminate use of antibiotics leading to antibiotic resistance, which result in; a) prolonged hospitalization b) mortality and c) increased healthcare cost. Antimicrobial stewardship (AMS) is key intervention for tackling AMR because it promotes appropriate use of antibiotics. The University Teaching Hospital has been awarded a grant to implement an AMS demonstration study to improve the appropriate use of antibiotics for BSIs and UTIs by 20% by all prescribers across the continuum care within 2 years. This analysis was performed to inform the interventional design.

Methods

We conducted assessment of the knowledge, attitude and practice among identified AMS stakeholders as part of the stakeholder engagement meetings in 9 facilities in which the 'Optimisation of antimicrobial use in BSIs and UTIs in Various Health Sector Settings in Zambia' project is being implemented. Stakeholder engagement activities were conducted to generate baseline information to inform AMS intervention design. A mixed method of individual questionnaire and focus group discussions (FGDs) were used to collect data from stakeholders. Data from individual questionnaires and FGDs were analysed using Stata software to generate descriptive statistics and manually analysed

to generate broader themes of antibiotic prescription pattern, antimicrobial usage and AMS interventions.

Results

Our results showed that AMR was a problem; 89% (149/168), 93% (157/168) and 81% (136/168) agreed that AMR was a problem globally, in Zambia and at their facilities, respectively. All the respondents acknowledged that an antibiotic education program would be needed in their facility. Most respondents exhibited a good attitude towards antimicrobial usage and AMS. Although less than 40% (61/167) of respondents felt that it was not difficult to select the correct antibiotics, 89% (132/148) of participants believed that unnecessary prescription of antibiotics can cause damage to patients. 83% (141/169) of participants felt that development of local antibiotic guidelines would be more useful than the international ones. 78% (126/162) of respondents indeed believe that antibiotic guidelines and AMS committees are helpful to clinical care. Most participants agreed that antibiotics are misused in Zambia; 61% (99/163) agreed that the decision on antibiotic to prescribe is more affected by the expiration date or its availability than the cause of the infection. Participants identified educational materials for providers and patients, training and mentorship for providers, improving interdepartmental communication, strengthening lab systems and performance incentives as key AMS implementation activities.

Conclusion

Despite some cited structural challenges in the participating facilities, there is potential for the successful implementation of AMS interventions. Development of local protocols and guidelines, availability of AMR training courses and related educational materials for providers, improved laboratory and diagnostic services, improved drug supply chain and availability of educational materials for patients can be key delivery tools for AMS implementation in Zambia.

5. THE ROLE OF SOCIAL NETWORKS IN NAVIGATING INADEQUATE WATER AND SANITATION INFRASTRUCTURE IN TWO URBAN COMMUNITIES IN LUSAKA CITY.

Scientific Abstract (Poster)

Mukuka, L[1], Zambia, M[2], and Chipimo, P.J.[3]

[1] University of Lusaka,

[2] Workers Compensation Fund Board;

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Introduction

About 70% of the population of Lusaka, Zambia's capital city, reside in high-density peri-urban communities, facing challenges with the sustainable and equitable delivery of water, sanitation, and hygiene (WASH) services. Using broad brush surveys (BBS), we documented how local residents navigate water and sanitation infrastructure options in two Lusaka urban communities.

Methods

In 2021, BBS (a rapid qualitative assessment approach) rapidly gauged the physical features, social organization, social networks, and local narratives of two contrasting urban communities, relating these features to water and sanitation infrastructure. BBS included focus group discussions (FGDs), structured observations and key informant interviews (KIIs) carried out over 12-15 days in each community. In total we conducted: 6 FGDs (45 women and 28 men participants, both local WASH and community stakeholders and mixed gender and age groups), 16 KIIs (community and WASH stakeholders) and 16 structured observations of places identified as relevant to WASH. Field and debriefing notes and short summaries were analysed thematically. Community dialogue meetings held in both communities shared and discussed key findings, followed by a national dissemination meeting.

Results

Options to access water included both formal and informal/alternative sources. Formal sources included: a public utility company, a water trust and boreholes. Informal/alternative sources included:

Shallow wells, drainage channels, scoop well, stream, and shared water supply. Inadequate supply of water resulted in a network of residents who share and use water from alternative sources such as private boreholes (households or institutions) and shallow wells. Use of shared water has created an informal economy; those supplying water offer it at unregulated and varied fees to those without. The supply of water from both formal and alternative sources thus generates income possibilities for residents. Sanitation options included: flush and pour flush toilets, ventilated improved pit (VIP) latrine and ordinary pit latrines, bucket, and flying toilets (cartons and plastics). Networks resulting from sanitation revolve around sharing of toilets (households without toilets due to full pits, unaffordability, or lack of space share with nearby households that have toilets), solid waste disposal (both through community-based enterprises and unauthorized dumpers) and manual desludging of pit latrines. Unlike with water supply, sanitation networks are formed based on reciprocity, friendship, trust, and proximity of households as opposed to an economic base. Both water and sanitation informal networks are more discrete and hidden and can be exploitative and promote poor practices and quality. Community stakeholders are also actively involved in coming up with alternative solutions to curb the inadequacy of sanitation infrastructure through cooperative arrangements such as building communal fee-paying toilets (by market cooperatives and Water Trust models) that also provide employment opportunities to residents.

Conclusion

Both communities were resilient and committed to finding solutions that met their basic water and sanitation needs. Alternative solutions have facilitated an informal economy that can both strengthen social connections and relationships, create livelihood possibilities, and generate income, as well as sometimes be exploitative and provide poor quality services. Formal WASH stakeholders need to recognize and engage with informal WASH networks to improve health and well-being.

6. MANAGEMENT OF COVID-19 IS ASSOCIATED WITH INCREASED MDR BACTERIAL INFECTIONS IN 2 AFRICAN SETTINGS

Scientific Abstract (Poster)

Tembo, J.[1], Elton, L.[2], Hamid M.M.A.[3], Elbadawi, H.[3], Maluzi K.[1], Abdelraheem M.H.[3], Cullip, T.[2], Kabanda, C.[1], Roulston, K.[2], Honeyborne, I.[2], Thomason, M.J.[2], Elhag, K.[3], Mohammed, A.[3], Adam, A.[3], Mulonga, K.[3], Sikakena, K.[1], Peter, M.[4], Kabaso, M.[4], Nakazwe, R.[4], Folowshi, S.[4], Zumla, A.[4], and McHugh, T.D.[5]

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Introduction

Patients who develop severe or critical illness due to COVID-19 are more likely to acquire bacterial co-infections and the WHO recommends prophylactic treatment with antibiotics. Few reports on the impact of COVID-19 on antimicrobial resistance have come from low and middle-income countries. This study compared hospital acquired bacterial infections developed by patients on COVID-19 and non-COVID-19 wards in Sudan and Zambia.

Methods

Infection prevention and control guidelines were analysed from non-COVID-19 and COVID-19 wards in both countries. Patients suspected of having a hospital acquired infection were recruited from COVID-19 wards and non-COVID-19 control wards. Isolates from patients were cultured and tested for antibiotic resistance using antibiotic disc diffusion and whole genome sequencing (WGS) was performed on a subset of isolates using the Oxford Nanopore Technologies to confirm resistances and identify AMR patterns.

Results

There was a significant increase in total HAIs on COVID-19 wards in Sudan, but the opposite was seen in Zambia. Phenotypically, significantly more multi-drug resistant isolates were found in patients on COVID-19 wards in both countries.

Conclusion

There was an increase in the number of resistances per isolate from COVID-19 wards (significantly so in Zambia), but no effect on other resistance patterns or prevalence of species.

7. SULPHADOXINE-PYRIMETHAMINE PARASITOLOGICAL EFFICACY AGAINST PLASMODIUM FALCIPARUM AMONG PREGNANT WOMEN AND MOLECULAR MARKERS OF RESISTANCE IN ZAMBIA

Scientific Abstract (Oral)

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[2] Africa University, Fairview Road, Old Mutare, Mutare, Zimbabwe

[3] Department of Epidemiology, School of Public Health, University of Zambia, Lusaka, Zambia

[4] Department of Disease Control, Faculty of Infectious and Tropical Diseases, London School of Hygiene and Tropical Medicine, United Kingdom

Introduction

Pregnant women in malaria-endemic areas are at high risk of *Plasmodium falciparum* infection. The World Health Organization recommends the provision of intermittent preventive treatment during pregnancy (IPTp) with sulphadoxine-pyrimethamine (SP) at four-week intervals from gestational week 13 to delivery in areas of moderate to high malaria transmission intensity. However, the effect of IPTp-SP has been compromised in some areas due to parasite resistance, raising the importance of parasitological and chemoprophylactic surveillance, and monitoring SP-resistance markers in the *Plasmodium falciparum* population. The study objectives were to estimate the therapeutic and chemoprophylactic efficacy of IPTp-SP and quantify the proportion of malaria parasites containing

mutations in the dihydropteroate synthase (DHPS) and dihydrofolate reductase (DHFR) genes associated with resistance to SP.

Methods

Between November 2013 and April 2014 in Nchelenge District, Zambia, 1,086 pregnant women received IPTp-SP at antenatal-care bookings. Blood samples were collected on day 0, and on day 28 post-treatment to test for malaria parasites and to estimate SP parasitological efficacy in the treatment and prevention of parasitaemia. A random sample of 96, day 0 malaria-positive samples were analysed to estimate the prevalence of SP-resistance markers in the *P. falciparum* population using the restriction fragment length polymorphism method. *In vivo* parasite-clearance efficacy and prophylactic effect of SP was established based on malaria microscopy and merozoite surface protein-2 (MSP2) genotyping which differentiated cases of recrudescence from reinfection.

Results

The overall parasitological and prophylactic failure among women who had paired day 0 and day 28 blood slides was 18.6% (95% CI 15.5, 21.8; 109 of 590). Among pregnant women who had asymptomatic parasitaemia on day 0, the day 28 PCR-uncorrected parasitological failure was 30.0% (95% CI 23.7, 36.2; 62 of 207) and the day 28 PCR-corrected parasitological failure was 15.6% (95% CI: 10.6, 20.6; 32 of 205). Among women who tested negative at day 0, 12.3% (95% CI: 9.0, 15.6; 47 of 383) developed parasitaemia at day 28. Among the 96 malaria-positive samples assayed from day 0, 70.8% (95% CI: 60.8, 79.2) contained the DHPS double (Gly-437 + Glu-540) mutation and 92.7% (95% CI: 85.3, 96.5) had the DHFR triple (Asn-108 + Ile-51 + Arg-59) mutation. The quintuple mutation (DHFR triple + DHPS double) and the sextuple mutant (DHFR triple + DHPS double + Arg-581) were found among 68.8% (95% CI: 58.6, 77.3) and 9.4% (95% CI: 4.2, 16.0) of samples, respectively.

Conclusion

Failure of SP to clear and prevent malaria, and the prevalence of resistance markers in Nchelenge District is alarmingly high. Alternative therapies are urgently needed to safeguard pregnant women against malarial infection.

8. ANTIMICROBIAL SUSCEPTIBILITY PATTERNS OF ESCHERICHIA COLI AND SHIGELLA ISOLATED FROM STOOL SAMPLES FROM ADULTS AND CHILDREN IN ZAMBIA

Scientific Abstract (Oral)

Hatyoka, L. M[1]., Mubanga, C[1]., Silwamba, S[1]., Luchen, C.C[1]., Mukena, N[1]., Chibesa, K[1]., Mwape, K[1]., Chilyabanyama, O.N[1]., Chibuye, M[1]., Chirwa, J. M[1]., Sukwa, N[1]., Patel, R[1]., Ngulube, J[1]., Mwaba, J[1]., Chisenga, C.C[1]., Simuyandi, M[1]., and Chilengi, R[1].

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Introduction

Antimicrobial resistance (AMR) is a growing public health problem in low-to-middle income countries which have a high burden of infectious diseases. Poor antimicrobial stewardship in these regions has resulted in a rise in reported cases of AMR creating a need for country specific data to inform policy on the strategies of combating AMR. Here we show antimicrobial susceptibility of Shigella, and E. coli isolated from stools of children under 5 years of age and adults.

Methods

The study was nested under an enterotoxigenic Escherichia coli (ETEC) vaccine clinical trial and diarrhoea surveillance. Stool samples were collected at baseline, during scheduled visits and whenever the participants presented with diarrhoea as per study design. Following microbiological techniques for culture and microorganism identification, pure colonies were run on the BD Phoenix™ 100 for identification and antimicrobial susceptibility. For ETEC identification, colony PCR was done on all E. coli positive samples using heat-labile toxin and stable toxin specific primers, respectively.

Results

Among the 211 samples analysed, 52.5% were from individuals with diarrhoea. Un-typed E. coli were the most common organism isolated (63.6%), followed by ETEC (12.7%) and 4.8% were Shigella sp. Majority of the organisms isolated were either susceptible or intermedial (80-100%) to all tested antibiotics except for Trimethoprim/Sulfamethoxazole which showed a high resistance of 82 – 93%. We also observed some multi-drug resistance (3.5%) among all organisms tested to the different antibiotics.

Conclusions

The observed high prevalence of co-trimoxazole resistance and intermedial susceptibility to fluoroquinolones among ETEC, Shigella and other un-typed E.coli isolates, is critical for informing policy on the urgent need for antimicrobial stewardship and strengthening of AMR surveillance systems in Zambia.

9. PERFORMANCE OF HIV RAPID DIAGNOSTIC TESTS USED IN LUSAKA PROVINCE - A SYSTEMATIC CLINICAL DATA REVIEW

Scientific Abstract (Oral)

Mukuka, L.[1]; Zambia, M.[2], and Chipimo, P.J.[3]

[1] University of Lusaka,

[2] Workers Compensation Fund Board;

[3] Zambia National Public Health Institute

Introduction

The World Health Organization recommends two sequential rapid diagnostic tests (RDTs) for HIV diagnosis. Enzyme Immuno-Assays (EIAs) are recommended as first-line screening tests in the 2014 Centers for Disease Control and Prevention (CDC) HIV laboratory testing algorithm.

Although the proportion of acute infections can be expected to vary across different populations, there are no studies examining the effect of this on the performance of HIV rapid tests. Health services that have the option of providing either HIV rapid tests or the more sensitive laboratory assays therefore need to know whether there will be a significant loss of sensitivity if they use HIV rapid tests in their clinical population. Zambia has an adult HIV prevalence of 11.1%. The national RDT algorithm in Zambia consists of a screening test (Determine® HIV 1/2) followed by confirmation of reactive specimens with a second rapid test (Uni-gold HIV 1/2). This study set out to investigate the performance of the HIV RDTs used in Lusaka Province.

Methods

2,564 participants aged between 15 and 95 years from two sites in Lusaka province years were tested on OraQuick ADVANCE, Abbot Determine™, and then confirmed on Uni-Gold™ Recombigen®. The data from the participants were analyzed using SPSS version 25.0.

Results

The 3 RDTs when compared to the 4th generation Abbot Architect results had the following results: OraQuick ADVANCE®, Alere Determine and Uni-Gold Ultra, at 95% CI had Sensitivities of: 91.8%, 93.3% and 92.5% respectively. The specificities of OraQuick ADVANCE® and Uni-Gold were the same (100.0%; 95% CI: 98.8 -100.0) but slightly different from Alere Determine (99.8%). Positive predictive values at 95% CI were 100% for OraQuick ADVANCE® and Uni-Gold and 98.4% for Alere Determine. Negative predictive values (at 95% CIs) were 99.1, 99.2 and 99.1 for OraQuick ADVANCE®, Alere Determine, and Uni-Gold Ultra respectively. The results showed that these RDTs could only detect 12 out of every 13 HIV positive results.

Conclusion

Third generation RDTs are not effective in detecting acute positive cases. Fourth generation Rapid Tests are required to capture the positive cases being missed out.

10. GENETIC MUTATIONS IN THE RPOB GENE CONFERRING RIFAMPICIN RESISTANCE IN M. TUBERCULOSIS ISOLATES AT NTRL, ZAMBIA

Scientific Abstract (Oral)

Mundia, K.[1]., Mutende, M.[1], Jonathan, M.[1], John, M.[1], Judy, M.[1], and Winnie, M.[1,2]

1 MOH.,

2 USAID-STAR Project.

Introduction

Multi-drug resistant (MDR) tuberculosis is a threat to global tuberculosis (TB) control. Zambia has adopted the use of GenoType MTBDRplus assay (Hain Lifescience, Germany) for rapid detection of

MDR-TB as per WHO recommendation. The assay targets codons 507-533 of the 81bp rifampicin resistance-determining region (RRDR) of the rpoB gene, where over 95% of all Rif resistance occurs. An understanding of rpoB gene mutations in Mycobacterium tuberculosis and determination of their frequency of occurrence as well as significance could prove useful in aiding correct choice of regimens, drug resistance monitoring, and successful control of transmission.The study sought to assess the spectrum and frequency of rpoB gene mutations in clinical isolates at NTRL, Zambia.

Methods

We reviewed line probe assay data for clinical isolates with rpoB gene mutations between January 2019 and December 2020 at the National Tuberculosis Reference Laboratory, Lusaka.

Results

Results for 49 isolates with mutations in the 81bp RRDR of the rpoB gene were analyzed. 46.9% (23/49) of the isolates showed absence of wild type (WT) with no corresponding mutation (MUT) bands. The most frequently observed mutation was absence of WT8 seen in 52.2% (12 /23) of the isolates, while absence of WT 2 was seen in 13.0% (3/23) of the isolates. 34.8% (8/23) of the isolates had missing WT bands in multiple regions of the rpoB gene. Of these, 25% (2/8) isolates had missing WT 1, 2 and 8, while 75% (6/8) of the isolates had missing WT bands of varied combinations in multiple regions of the rpoB gene. 28.6% (14/49) isolates showed all WT bands with varied MUT bands (hetero-resistance), majority (71.4%; 10/14) of which were rpoB Mut2B (H526D). The rest were rpoB Mut3 (S531L), rpoB Mut2A (H526Y), and rpoB Mut1 (D516V), all with a frequency of 7.1% (1/14) each. 2% (1/49) of the isolates had both rpoB Mut2B and rpoB Mut3 mutations at codon H526D and S531L of the rpoB gene.18.4% (9/49) isolates had missing WT with corresponding MUT bands, while 4.1% (2/49) isolates had missing WT with MUT bands in non-corresponding regions.

Conclusion

The reviewed data shows a high proportion of isolates with missing wildtypes without any accompanying mutation bands in regions known to confer resistance. This observation could be suggestive of new and uncommon resistance in the rpoB gene being generated in our setting. Furthermore, presence of both wildtype and mutant strains at the same time could suggest acquired resistance due to suboptimal therapy or superinfection of a drug-susceptible TB patient with a resistant

strain. Sequence and phenotypic analysis of these strains could reveal specific mutations in the rpoB gene in our setting and further elucidate their clinical significance.

11. ACCURACY AND REPRODUCIBILITY OF A WHO APPROVED PHENOTYPIC DRUG SUSCEPTIBILITY TESTING METHOD FOR SECOND-LINE ANTI-TUBERCULOSIS DRUGS

Scientific Abstract (Oral)

Jonathan, M[1]., Mundia, K[1]., Samuel, M[1]., Mutinta, C[2]., Olipa, P[3]., Kabengele, S[3]., Ngula, K[3]., Mutende, M[1]., Judith, M[4]., and Winnie, M[4]

[1]National Tuberculosis Reference Laboratory, Ministry of Health,

[2] University Teaching Hospital, TB Laboratory,

[3] Tropical Diseases Research Center, TB Laboratory,

[4] National Tuberculosis and Leprosy Program, Ministry of Health

Introduction

The National Tuberculosis/Leprosy Program (NTLP) adopted new WHO guidelines for treatment of drug resistant tuberculosis (DR TB) in 2019. Included in these guidelines are newer and repurposed 2nd line anti-TB drugs such as bedaquiline (BDQ), linezolid (LZD), clofazimine (CFZ) and delamanide (DLM). However, capacity for Drug Susceptibility Testing (DST) for the newer drugs had not been built in the TB laboratory network, thus pausing a challenge in the clinical management of DR TB patients due to lack of laboratory assured results for effective patient management. A Mycobacteria Growth indicator Tube (MGIT) based phenotypic DST method has been validated and standardized for use globally. We adopted this method and conducted an in-country method verification study between August and December 2021 to determine the fitness of the method in our setting. This verification study was conducted at Chest Diseases Laboratory and the two regional TB reference laboratories, UTH TB laboratory and TDRC.

Methods

To evaluate the ability of the method to rule out resistance to the respective drugs, we used a well characterized fully susceptible control strain (H37RV). Certified control strains with known resistance to MOX and LEV were used to evaluate the ability of the method to detect resistance to these drugs. 2 clinical isolates with known resistance to Fluoroquinolones (LEV and MOX) were included to evaluate the ability of the method to detect resistance to Fluoroquinolones in clinical isolates. The isolates were aliquoted, given identification numbers and distributed to all three culture laboratories for processing following the SOP adopted for national use. Results from all 3 laboratories were compiled and compared against expected and known results for respective isolates to measure accuracy and reproducibility of the method.

Results

All the 4 drugs verified against the susceptible reference strain (H37Rv) showed 100% concordance and reproducibility at ruling out resistance to BDQ, CFZ, LEV and MOX in all the 3 culture laboratories. All 3 laboratories were able to detect resistance to LEV and MOX with 100% accuracy and reproducibility. All 3 labs were able to detect resistance to the fluoroquinolones (MOX and LEV) with 100% agreement and reproducibility. Lack of resistant control strains for BDQ and CFZ was a limitation.

Conclusion

The results obtained through our verification process authenticates the MGIT DST method for 2nd line drugs in line with WHO recommendation for validation protocols to attain 95% or greater inter-test agreement prior to commencement of testing clinical isolates. The standardized method is fit for DR-TB drug susceptibility profiling to inform patient centered treatment decisions and is therefore, recommended for adoption and roll out in our TB diagnostic network.

12. GENOMIC SURVEILLANCE OF SARS-COV-2 VARIANTS RESPONSIBLE FOR A SUSTAINED INFECTION OF COVID-19 IN LUSAKA, ZAMBIA.

Scientific Abstract (Oral)

Sikalima, J.[1], Muyombo, A.[1], Sandala, D.[1], Chilufya, C.[1], and Mainza Shempela, D.[1]

[1] Churches Health Association of Zambia, Laboratory Department, Lusaka, Zambia.

Introduction

All viruses, SARS-Cov-2 inclusive, continuously evolve as changes in the genetic code through mutations or viral recombination occur over time. Though most of these mutations are not consequential, others affect how the virus enters cells, escapes the body's immune response, becomes resistant to certain medications, and replicates. The study was set out to understand the SARS-COV-2 variant dynamics accounting for COVID-19 cases in a cosmopolitan province as part of routine genomic surveillance.

Methods

Between November 2021 and June 2022, 303 samples from all SARS-CoV-2 positive samples collected through routine surveillance screening and exit travelers underwent WGS after meeting the criteria including a Ct value of <30. Viral RNA was extracted using the MagMax® kit on an automated KingFisher Flex platform according to manufacturer specifications. Libraries were prepared using the Illumina COVIDSeq® kit on the automated Hamilton robotic instrument. Pooled samples were then quantified and normalized using a Qubit dsDNA Assay kit to a final loading concentration of 1nM onto the Illumina NextSeq 2000 instrument.

A customized version of the DRAGEN COVID Lineage pipeline was used to perform Kmer-based detection of SARS-CoV-2. This then aligned the reads to a reference genome, called variants, and generated consensus genome sequences of lineage/clade analysis using Pangolin and NextClade.

Results

Fifty four percent of the total samples analyzed were female. The Inter-Quartile Range for the age groups was 29 (IQR=29). Two sub-variants of Omicron, BA.1, BA.1.1 and BA.1, BA.1.4 were

detected between November - December 2021 and January - February 2022 respectively. These sub-variants had up to 60 mutations as the highest recorded. Eight Omicron sub-variants were detected from samples collected in June and July 2022 with up to 76 mutations. These 8 sub-variants included BA.5.3.1. One of the 3 samples that recorded frameshifts had a Gap of 2 nucleotide(s) found at reference position 27237, this was observed in the Open Reading Frame (ORF) 6 while the other 2 were in ORF7b and ORF8. Un-expected premature stop codons were observed at ORF7a:75 in two samples one of the BA.4 and BA.4.1. The rate at which mutations in viruses occur is beyond polymerase fidelity but factors such as fitness cost for viral survival and diverse aspects of viral biology, such as genomic architecture. These could explain the emergence of multiple sub-variants observed in the months of June and July 2022 even after only two sub-variants accounted for sustained infections at the close of 2021. Though the exact roles of each subvariant isolated have not been clearly unveiled, the associated mutating viral proteins have been linked to viral transmission, pathogenicity, and immune evasion.

The observed dominance of the BA.4.1 subvariant suggests the viral mutations to survive host immune response as evidenced by increase in mutations. Further, ORF6 is an accessory protein that has been associated with inhibition of the immune signaling pathway in early stages of antiretroviral response, the notable frameshift with 2 nucleotide(s) Gaps could suggest advanced suppression mechanisms by the virus responding to host acquired immunity. However, presence of 2 premature stop codons in ORF7a:75 which could be as a result of direct host pressure (or vaccine?) to prevent the virus from further replication.

The observed mutations from these samples demonstrate gains in therapeutics and vaccines as well as provide an insight in viral tactics for survival. This underscores the need for genomic vigilance to closely monitor viral dynamics.

Conclusion

Beyond accounting for 'new' COVID-19 infections, case characterization by public health specialists must include molecular fingerprinting of viral lineage. This could help assess variant contribution to disease outbreaks, morbidity and mortality as well as to closely monitor and predict further mutations that may lead to more virulent and fast spreading SARS-Cov-2 variants.

13. MICROBIOLOGIC AND VIRULENCE CHARACTERISTICS OF MORAXELLA CATARRHALIS ISOLATES FROM ZAMBIAN CHILDREN PRESENTING WITH ACUTE PNEUMONIA

Scientific Abstract (Poster)

Nawa, M.[1,2], Mwansa, J.[3], Mwaba, J.[1,2], Kaonga, P. [4], Mukubesa, A.N. [5], Simuyandi, M.[1], Chisenga, C.C. [1], Alabi, P.[1], Mwananyanda, L.[6], Thea, D.M. [6], Chilengi, R.[1], and Kwenda, G.[2]

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[6] Department of Global Health, Boston University School of Public Health, Boston, Massachusetts, USA.

Introduction

Moraxella catarrhalis is one of the bacterial pathogens associated with childhood pneumonia, but its clinical importance is not clearly defined. The main objective of this study was to investigate the microbiologic and virulence characteristics of M. catarrhalis isolates obtained from children with pneumonia in Lusaka, Zambia.

Methods

This retrospective, cross-sectional study analyzed 91 M. catarrhalis isolates from induced sputum samples of children less than five years of age with pneumonia enrolled in the Pneumonia Etiology Research for Child Health study in Lusaka, Zambia between 2011 and 2014. This study was conducted at the University Teaching Hospital situated in Lusaka, Zambia, between 1 January, 2020 and 31st March, 2021. Bacteria identification and virulence genes detection were performed by PCR and DNA sequencing, while antimicrobial susceptibility testing was determined by the Kirby-Bauer method.

Results

All the M. catarrhalis isolates were obtained from good-quality sputum samples and were the predominant bacteria. These isolates harbored virulence genes copB (100%), ompE (69.2%), ompCD (71.4%), uspA1 (92.3%), and uspA2 (69.2%) and were all β-lactamase producers. They showed resistance to ampicillin (100%), amoxicillin (100%), trimethoprim-sulfamethoxazole (92.3%), ciprofloxacin (46.2%), chloramphenicol (45.1%), erythromycin (36.3%), tetracycline (25.3%) cefuroxime (11.0%) and amoxicillin-clavulanate (2.2%), with 71.4% displaying multi-drug resistant phenotype but all susceptible to imipenem (100%).

Conclusions

This study showed that M. catarrhalis isolates were the predominant or only bacterial isolates from the sputum samples analyzed. These isolates harbored genes encoding virulence factors. The findings provide supportive evidence for the pathogenic potential role of this bacterium in pediatric pneumonia. High multidrug resistance was also observed amongst the isolates, which can result in affected patients not responding to standard treatment, leading to prolonged illness, increased healthcare costs, and risk of death. The findings of this study underscore the need to identify M. catarrhalis as a possible LRT pathogen in children, particularly when microbiologic and clinical criteria are met.

14. IMPORTANCE OF MOLECULAR BLOOD-MEAL ANALYSIS IN VISUALLY BLOODED AND UNFED ANOPHELINE SPECIES IN A LOW TRANSMISSION AREA TARGETED FOR MALARIA ELIMINATION.

Scientific abstract (Poster)

Simubali, L.[1], Mwaanga, G.[1], Mudenda, T.[1], Thuma, P.E.[1,2], Simulundu, E.[1], Gebhardt, M.E.[2], Norris, D.E.[2], Stevenson, J.C.[1,2], and Mburu, M.M.[1]

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Southern and Central African International Center of Excellence for Malaria Research

Introduction

Malaria research has been effectively conducted from the late 1980s to date at Macha, and prevalence has significantly decreased in the area by >90% since 2000. Community prevalence by RDTs is currently at < 5%, and the area is targeted for malaria elimination. The main vector in the area is *Anopheles arabiensis,* with a wider composition of potential vectors such as *An. squamosus. Anopheles arabiensis* has previously been found to have an affinity for human blood. Additionally, increased blood meals can be detected when both visually fed and unfed mosquitoes are tested. Blood meal status of vector species evaluates malaria transmission drivers. Therefore, the aim of the study was to assess whether blood meals from visually scored (morphologically identified) unfed female anophelines would be detected using molecular methods.

Methods

The study was conducted in 137 households (HHs) within the Macha region from January to December 2017. The HHs were organized into two arms; a) malaria index-case HHs and b) reactive-case HHs (within a 250-meter radius of the index HH). Standard Centers for Disease Control Light traps (CDC-LTs) were set in these HHs, both indoors and outdoors, from 18:00-06:00 hrs, with outdoor CDC-LTs set near animal pens. The research team collected the traps the following morning and collections were transported to the laboratory at Macha Research Trust. Anopheline specimens

were identified morphologically and the abdominal status was scored as either blood-fed or unfed. Abdominal DNA (from both unfed and blood-fed anophelines) was used for detecting the blood meal hosts via molecular assays.

Results

From across all HHs and locations, a total of 4284 female anopheline mosquitoes were collected during the study. Of the female anophelines caught, 5% and 95% were scored as blood-fed and unfed, respectively, during the morphological identification. Of those scored as blood-fed, molecular assays detected blood in 86.6% of specimens. However, there was an increase in the PCR positivity rate by 1.7% when samples which were visually scored unfed were also tested for blood feeding hosts by PCR.

Conclusion

This study demonstrated the importance of conducting molecular analysis on both visually blooded and unfed anopheline mosquitoes based on the discrepancies between morphological and molecular methods of visual scores of blood-fed and unfed anophelines, which are mostly due to mosquitoes' partial blood feeding, digestion of blood meals, sample condition, and/or expertise of entomology field staff. Furthermore, routine testing for blood-fed and unfed mosquitoes would provide decision makers with information regarding the host preferences of the mosquitoes, which could be used for targeted vector control methods.

15. EVALUATION OF THE NOVODIAG BACTERIAL GE+® PLATFORM FOR DIAGNOSIS OF ETEC IN CHILDREN UNDER THE AGE OF 5 PRESENTING WITH MODERATE TO SEVERE DIARRHEA AT HEALTH FACILITIES FROM PERI-URBAN AREAS OF LUSAKA IN ZAMBIA.

Scientific Abstract (Oral)

Chibesa, K., Chibuye, M., Chilyabanyama, O.N., Simuyandi, M., Mwape, K., Silwamba, S., Luchen, C.C., Sukwa, N., Liswaniso, F., Mubanga, C., Somwe, P., Maimbolwa, M.M., Chisenga, C.C., Muyoyeta, M. and Chilengi, R.

Centre for Infectious Disease Research in Zambia, University of the Free State, University of Amsterdam, University of Johannesburg, University of Zambia, University of Rwanda, Stellenbosch University.

Introduction

Enterotoxigenic Escherichia coli (ETEC), one of the leading bacterial causes of causing 18,700 to 42,000 deaths in children <5. ETEC, like many other pathogens causing diarrhoea, is not routinely screened for in clinical settings hence the true burden is not known. While culture-based methods remain the gold standard for diagnosis and isolating diarrheagenic pathogens, they are limited by their low sensitivity, labour intensiveness, long turnaround time and need to have experienced and skilled staff to perform. All these contribute to the paucity of accurate burden data on ETEC among children <5. Advancements in molecular technology have necessitated the development of molecular based diagnostic multiplex platforms including the Novodiag BGE+ panel (targeting 13 pathogens), which promises to have a quick turnaround time, simple to use in limited resource settings, and very sensitive. We present the results of the performance of the Novodiag BGE+® at ETEC diagnosis compared to a combination of culture and colony PCR as gold standard.

Methods

This analysis is nested on a prospective cohort study which aimed at determining the incidence of ETEC associated diarrhoea in children <5 presenting with moderate to severe diarrhoea at any one of the five health facilities located in peri-urban areas of Lusaka, Zambia. Fresh stool samples were collected from the children at the respective health facilities and immediately cultured on MacConkey overnight while a swab from the same stool sample was transferred to preservative and lysis media in the eNAT® tubes to test on the Novodiag BGE+® as per the manufacturer's protocol. DNA was

extracted from colonies with E. coli biochemical profiles for use in ETEC colony PCR targeting the toxin genes (LT, STh, and STp). DNA bands respective of the toxin genes were indicative of the presence/absence of any of the three toxins after gel electrophoresis. Samples in the eNAT tubes was transferred into a Novodiag BGE+ cartridge and then loaded on the Novodiag platform with a positive, negative or invalid being shown at the end of the run. PCR and Novodiag results for each sample were then compared to calculate the sensitivity and specificity of the Novodiag BGE+ panel.

Results: A total of 911 samples collected between November 2020 and July 2021 were tested using both the Novodiag BGE+ panel and culture/colony PCR. A total of 267/911 (29.3%) samples tested positive for ETEC on the Novodiag BGE+® panel, while 84/911 (9.2%) were positive for ETEC by culture/colony PCR. Using culture/colony PCR as the gold standard, the Novodiag BGE+® panel had a Sensitivity of 86.9% (95% CI: 77.8 – 93.3%), Specificity of 76.5% (73.5 – 79.4%, 95% CI), with a Positive Predictive Value of 27.3% (95% CI: 22.1 – 33.1%) and a Negative Predictive Value of 98.3% (95% CI: 97.0 – 99.1%).

Conclusion

The Novodiag BGE+® panel is a very sensitive and specific tool for detecting ETEC in stool and can be used as a screening tool for ETEC in children presenting with diarrhoea which would help narrow samples that can be targeted for culture to isolate pathogens for more detailed analysis such as toxin, AMR and CFs profiles. We think that the low PPV observed was due to low ETEC yield on culture given that we only collected 5 lactose fermenting colonies reducing the chances of picking an ETEC E. coli colony while the Novodiag amplifies directly from stool using total nucleic acid.

EFFECT OF COVID-19 PANDEMIC ON PUBLIC HEALTH SERVICES AND SYSTEMS

16. CLINICAL CARE LESSONS FOR OPTIMAL HEALTH OUTCOMES DURING COVID19 PANDEMIC: HEALTH WORKFORCE DEPLOYMENT AND UTILIZATION IN CLINICAL CARE MANAGEMENT AT LEVY MWANAWASA HOSPITAL ISOLATION CENTRE

Best Practices Abstract (Oral)

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[1] *Centre for Primary Care Research*

[2] *University of Zambia School of Medicine*

Introduction

Multi-disciplinary approaches to patient care have been hailed to greatly improve clinical outcomes in a broad range of disease entities both communicable and non-communicable. The outbreak of SARS-Cov2 infection in 2019 (Covid19) provided a rare challenge to the clinical care systems in many jurisdictions, worse in the nations with weak health systems as exemplified in Low and Low-Middle Income Countries (LMICs).

Methods

A clinical audit was done of patients admitted to the main Covid19 isolation centre at Lusaka's Levy Mwanawasa Hospital to appreciate the range of services rendered for diagnosis, therapeutic and rehabilitation care. Case records were reviewed for adequacy of history taken and physical examination, laboratory tests done, results obtained and therapeutic interventions instituted.

Results

A total of 406 case records were reviewed. Several vital signs were not recorded such as temperature and oxygen saturation. Fever was documented in only 7.7% of patients. About 39.5% of patients had significant tachycardia. Over 71.2% of patients had tachypnea though only 52.5% reported overt dyspnea on admission. More than 41.1% had hypertension and 15.6% were dysglycemic. ECG and echocardiogram were done on only 10.4% and 3% of the patients respectively. Laboratory tests were scantly done and some results were not on file especially those that related to the hypercoagulability state of Covid19.

Conclusion

Case records imply severe maldistribution of health workers and extreme limitation of access to laboratory services at the tertiary institution. The multi-organ involvement of Covid19 required a good density of healthworkers for optimal clinical care. Only Infectious Diseases specialists seemed to be available in the facility. Medical specialties not actively engaged included cardiologists, pulmonologists, and diabetologists. Other health care professionals not engaged in this care cascade included Pharmacists, Physiotherapists, Radiographers and Biomedical Scientists whose roles were critical for better health outcomes. There was a serious lack of multi-disciplinary clinical practice indicating an urgent need for multi-disciplinary practice going forward and careful health workforce planning and deployment.

17. OPTIMIZING LABORATORY SUPPLY CHAIN MANAGEMENT AMIDST THE COVID19 PANDEMIC IN HEALTH FACILITIES IN MONZE

Best Practices Abstract (Oral)

Kaira, M. [1], Mushunga, J. [2], and Nduluma, R.[2].

[1] Monze District Health Office

[2] Monze Urban Clinic

Introduction

Supply chain management plays a significant role in primary health care and the diagnosis and treatment plan for clients. In districts like Monze, with 42 health facilities serving a population of 163,578, the concept of laboratory supply chain management is vital as it promotes equitable access to cost-effective health care services closer to the family as possible, promotes early diagnosis which leads to appropriate healthcare interventions and reduced morbidity and mortalities. In 2021, following the effects of COVID-19, the district faced erratic supply of key laboratory diagnostic tests such as Human Immunodeficiency Virus test kits, Ethylenediamine tetraacetic acid (EDTA) containers and rapid syphilis tests. It is for that reason that this quality improvement project was initiated to optimize laboratory supply chain in selected key laboratory commodities by improving the

months of stock of a specified laboratory commodity from 0.7 months of stock to a minimum of 1 month of stock by September, 2022. Commodities to be monitored were; Determine, Oraquick, SD Bioline, EDTA, Genexpert, RSTs, DBS bundles, Urinalysis

Methods

Mixed-method evaluations were conducted at baseline August, 2021. Qualitative data was collected in 12 facilities at baseline level. The data collected at baseline assessments identified common bottlenecks to supply chain management. A root cause analysis to the identified bottlenecks was then conducted at district level using a but why tree. The root causes included Lack of knowledge of commodity availability, Lack of communication from district level of commodity availability and delayed ordering of commodities. Interventions included weekly collection of stock status from facility and district level which encouraged proactive networking systems from neighboring facilities that were well stocked. As well as requisitioning of sufficient stocks from ZAMMSA to carter for facility consumption.

Results

The results show that from a baseline month of stock of Determine (0.7), Oraquick(0.7), SD Bioline(0.5), EDTA(0.9), Genexpert(1.2), RSTs(0.7), DBS bundles(0.7), Urinalysis(0.5) as of august 2021, the stock status improved to currently; Determine (3.4), Oraquick (1.5) SD Bioline (1.9), EDTA (3.7), Genexpert (4), Rapid syphilis test (1.2), DBS Bundles (2.1), Urinalysis (2.1) representing a 33% improvement of commodity availability since the implementation of the interventions. The district laboratory hub did not experience any stock outs though low stocks in Oraquick, urinalysis and rapid syphilis tests were experienced in the last quarter of 2021, the picture however changed by February 2022.

Conclusion

The quality improvement findings demonstrate that a good communication and networking systems for stock availability and stock accessibility from facility to district level does help to improve the general stock status of laboratory commodities. However, reliable availability of health commodities at the community level is not possible without dependable national level availability and a higher-level supply chain that facilitates efficient movement of community products to resupply points and data to and from all levels of the system.

18. SUB-HEALTH CENTRE MALARIA SURVEILLANCE AND PANDEMIC RESPONSE: SETUP AND COMMUNITY USE CASES OF A MOBILE APPLICATION

Best Practices Abstract (Oral)

Matoba, J.[1] Kvit, A.,[2] Martin, A.,[1] Lubinda, M.,[1] Sing'anga, C.,[2] Thuma, P.E.,.[3] Simulundu, E.,[3] Shields, T.,[2]Kobayashi, T.,[2] Hackman, A.,[2] and Moss, W.J.[2]

[1] Macha Research Trust,

[2] Johns Hopkins University Bloomberg School of Public Health,

[3] Macha Research Trust/Johns Hopkins University.

Introduction

In its Malaria Elimination Strategic Plan, the Zambian government identified the health facility catchment (HFC) as the unit to target and measure elimination and to plan and implement interventions. However, existing surveillance tools focus on implementation at the provincial or district level and are rarely tailored for the HFC level or below. This gap in timely community-level data goes beyond malaria and was apparent in the recent COVID-19 pandemic. Here, we present a community-based mobile application for malaria case data at the sub-HFC level in a rural malaria pre-elimination setting of southern Zambia and will discuss its applications to managing pandemic response of diseases other than malaria.

Methods

An RShiny web-based application was developed and piloted at Mapanza Rural Health Centre (RHC), in Choma District, Southern Province, Zambia, which is earmarked for malaria elimination. The app provided malaria surveillance data to health center workers and Community Health Workers (CHW) at the HFC. The web-based app displayed malaria cases by zone on RHC catchment maps, which were created using a combination of satellite imagery, ArcGIS software and physical verification by CHWs and RHC staff. Data was submitted to the app through mobile-phone, SMS reporting by CHWs. A first iteration was piloted in 2020 with weekly case reporting, and a second iteration in 2022, which relied on reporting individual cases by SMS and task-based messaging. Questionnaires were

administered to community level end users on experiences around the ease of use, potential use case scenarios and desired outputs from the mobile application. A survey around the available surveillance platforms and catchment maps was also conducted.

Results

The community-based surveillance malaria app provided timely visibility on emergent and incident malaria cases at a fine spatial level; this supported immediate and longer term response planning for specific targeting of resources. For example, although Mapanza RHC catchment had a higher number of malaria cases, the mapping in the RShiny app showed that malaria incidence was not homogenous at the sub-HFC level, so interventions could be better targeted. Furthermore, inclusion of the task-based messaging helped provide immediate feedback to supervisors and identify gaps in critical steps. Lastly, disaggregated data provided research opportunities; sub-HFC maps were generated and comparisons made with geometrically estimated models. RHC staff reported not having any other surveillance platforms targeted for response at the HFC.

Conclusion

Community-based malaria surveillance apps can be leveraged to target sub-HFC of malaria transmission and thus guide community-led interventions. Furthermore, the infrastructure developed can easily be adapted for pandemic response at community level beyond malaria.

19. HEALTH SYSTEMS RESPONSE TO ROUTINE MATERNAL AND CHILD HEALTH SERVICE DELIVERY AMIDST COVID -19 PANDEMIC AT KANYAMA 1ST LEVEL HOSPITAL - LUSAKA DISTRICT.

Best Practices Abstract (Oral)

Syakayuwa, T.[1]

[1] *Cavendish University*

Introduction

This study was set out to ascertain the health systems response to routine maternal and child health services amidst the COVID -19 pandemic at Kanyama 1st Level Hospital – Lusaka, Zambia.

Methods

A qualitative research study was conducted on Antenatal Clinic and Post Natal Clinic mothers as targets; Community Health Workers, Health Care Workers, and policy makers as key informants, utilizing five (5) Focused group discussion to reach saturation. Data was collected using topic guides and analyzed manually by transcribing and coding it. Sample size for participants were selected using simple random sampling on ANC/ PNC mothers, while the three categories of key informants were purposefully selected. The indirect effects of COVID-19 pandemic framework which mirrors the WHO six building blocks adopted from the Global Health Life Saving Tools was used to analyze the health system's readiness amidst the COVID-19 pandemic at Kanyama 1st Level Hospital – Lusaka, Zambia. The aim of this study was to ascertain the health systems response to routine maternal and child health services amidst the COVID -19 pandemic at Kanyama 1st Level Hospital – Lusaka, Zambia.

Results

Findings were that the facility had challenges with regards to health workforce, supplies and equipment, which ultimately affected quality provision of maternal health services as outreach services were disrupted. Although the health facility responded well in providing alternative schedules to cope with the influx of mothers at the center from the closed outreach posts, the epidemic preparedness in responding to the epidemic was not up to the expected standards. Later, reduction in PNC and ANC attendance was noted, and home deliveries and deaths suddenly increased. The HCW, CHWs also had challenges ranging from lack of psychosocial support / Personal Protection Equipment's, and inadequate training. In addition, frontline workers had inadequate knowledge on triaging Covid-19 suspected pregnant mothers. Also findings such as lack of tracking system for follow up on mothers who missed appointments due to fear of contracting COVID -19; and essential drug stock out was noted during the pandemic. Monitoring and evaluation system was in place but irregular and not in tandem with prompt feedback that was required. On the other hand, the study results also revealed one positive aspect of ANC/PNC mothers having knowledge on the importance of maternal services despite fears for COVID – 19, facility delivery, signs and symptoms of COVID -19 infections and preventive measures. However, the end users expressed myths on the transmission of the virus and the testing process.

Conclusion

The research revealed lack of epidemic preparedness at Kanyama 1st level hospital that would allow the continuation of maternal and child health services amidst the COVID-19 outbreak. The facility had needed a timely and comprehensive health system response to the epidemic that is elaborate and specific to respond to all specifics of the health system in relation

20. FACTORS ASSOCIATED WITH MORTALITY IN HOSPITALIZED COVID-19 PATIENTS, ZAMBIA 2021-2022

Scientific Abstract (Oral)

Chanda, S.L.[1], Kapina, M.[2], Sinyange, N.[2], Zulu, P.M.[2], and Kapata, N.[2]

[1] Zambia Field Epidemiology Training Program

[2] Zambia National Public Health Institute

Introduction

During the COVID-19 pandemic >2,500 COVID-19 related deaths were reported nationally from 2021-2022 from health facilities in Zambia. Social demographic factors and comorbidities have been shown to affect COVID-19 inpatient mortality however, in Zambia, factors associated with COVID-19 inpatient mortality remain unknown. The study set out to use a national surveillance system, we sought to determine predictors for time to death in hospitalised COVID-19 patients between 2021 and 2022 in Zambia.

Methods

We conducted a retrospective cohort study of inpatient COVID-19 related deaths reported to the Zambia National Public Health Institute from all health facilities in Zambia between January 2021 and June 2022. SARS-CoV-2 diagnosis was by polymerase chain reaction or rapid diagnostic test. Primary outcome was time to death (days) at any point during admission. We extracted data on socio-demographics (age, sex, province, and district type [Urban Vs Rural]), and comorbidities (Diabetes, Hypertension, Stroke, Tuberculosis, HIV, Chronic liver disease, Renal dysfunction, Obesity, Sepsis, Malaria and Malignancy) at admission. A COVID-19 wave was defined as a period of sustained increase in nationally reported SARS-CoV-2 daily test positivity of >5%, days were dichotomised as

wave or non-wave days. Time to event was calculated as the number of days between date of admission and date of death. Descriptive statistics were performed using appropriate statistical tests, Kaplan Meier analysis was used to estimate survival probability and Cox regression was used to calculate adjusted Hazard Ratios (aHR) with 95% Confidence Interval (CI) in R.

Results

A total of 1257 inpatient COVID-19 related deaths were analysed from all ten provinces of Zambia. Median age at death was 64 years (Interquartile range [IQR] 49.00-77.00) and 57.50% were male ($p<0.001$). Overall, median time to death was 3 days (IQR 2.00-7.00 days). COVID-19 waves (aHR = 1.56; 95% CI: [1.32-1.85]), comorbid infection with malaria (aHR= 1.54; [1.08-2.19]), rural districts (aHR= 1.38; [1.11-1.73]), Southern, Northern and Central provinces (aHR=1.27[1.03-1.57], aHR=1.43[1.04-1.98], aHR=1.48(1.07-2.05) respectively) were independent predictors for in-hospital COVID-19 mortality.

Conclusion

Overall, 50 percent of all COVID-19 deaths occurred by day 3 of admission. COVID-19 waves and malaria co-infection were associated with increased mortality. Compared to Lusaka, Southern, Northern, Central provinces and rural districts were also associated with increased probability of death. There isneed to build capacity in COVID-19 case management in rural districts and during COVID-19 waves in Zambia. In managing COVID-19 patients, clinicians should consider the possibility of coinfection with malaria. As swift diagnosis is key, we suggest a low threshold for malaria testing in patients with COVID-19.

21. GEOSPATIAL FACTORS ASSOCIATED WITH SARS-COV-2 PREVALENCE DURING THE FIRST WAVE IN ZAMBIA, JULY 2020

Scientific Abstract (Oral)

Chanda, S.L.[1], Imamura, T.[2], Musuka, C.[3], Malambo, W.[4], Sinyange, N.[1], and Hines, J.Z.[4]

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Introduction

Describing factors associated with SARS-CoV-2 transmission can inform prioritization of mitigation measures. While individual-level factors like mask use are known to be associated with reduced risk of SARS-CoV-2 transmission, geospatial factors like population density could also be relevant for transmission of a virus spread through respiratory secretions. We assessed the relationship of geospatial factors and SARS-CoV-2 prevalence during Zambia's first wave.

Methods

We did a cross-sectional study of SARS-CoV-2 prevalence in six districts in July 2020, during the upslope of the first COVID-19 wave in Zambia. In each district, 16 enumeration areas (EAs) were randomly selected and 20 households from each EA were sampled. SARS-CoV-2 prevalence was calculated as the number persons with a positive PCR test divided by the number tested. We analysed EA geospatial data for population density, socioeconomic status, literacy, and access to water, sanitation, and hygiene. Generalized estimating equations were used to measure adjusted prevalence ratios (aPRs) and 95% confidence intervals (CIs) for SARS-CoV-2 prevalence, adjusting for clustering by district.

Results

SARS-CoV-2 prevalence was 72 infections per 1,000 population, with a median EA prevalence of 42 infections per 1,000 population (interquartile range, 0–96). Prevalence was higher in urban EAs compared to rural EAs (82 versus 35 infections per 1,000 population; aPR: 1.61 [95% CI: 1.07-2.42]). In urban EAs, increasing population density was associated with lower SARS-CoV-2 prevalence (aPR: 0.98 [0.96-0.99]).

Conclusion

Early in the COVID-19 epidemic in Zambia, less dense urban areas had higher SARS-CoV-2 prevalence. The study timing could have impacted the findings, with wealthier enclaves affected earlier possibly because of more exposures related to greater international travel. Additional analyses from subsequent waves could assess if these findings persisted in Zambia. During the beginning of subsequent COVID-19 waves in Zambia, surveillance and response activities might focus on urban areas that are more connected to international travel.

22. CHARACTERISTICS OF CASES AND DEATHS ARISING FROM SARS COV-2 INFECTION DURING THE FIRST AND SECOND WAVES IN ZAMBIA: MARCH 2020 TO APRIL 2021

Scientific Abstract (Oral)

Chanda, S.L.[1,2], Tembo, E.[1,2], Sinyange, N. [2], Kayeyi, N. [2], Musonda, K. [2], Chewe, O. [2], Kasonde, M.[2], Kapona, O. [2], Ngomah, A.[2], Hamukale, A. [1,2], Zulu, P.M.[2], and Kapina, M.[2]

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Introduction

Since March 2020, Zambia has been experiencing a SARS-CoV-2 epidemic. Little data has been reported on cases and deaths arising from COVID-19 in Zambia and Africa in general. Knowledge on the demographic characteristics of cases and deaths arising from SARS-CoV-2 infections can

inform the public health response to emerging epidemics. We described the demographic characteristics of cases and deaths from SARS-CoV-2 infection during the first and second COVID-19 waves in Zambia.

Method

We analyzed data on all persons testing positive for SARS-CoV-2 from 18th March 2020 to 25th April 2021 in Zambia. COVID-19 cases were identified in Zambia through port-of-entry surveillance, contact-tracing, health-care-worker testing, health-facility-based and community-based screenings, and community-death screening. All diagnoses were confirmed using real-time polymerase chain reaction and rapid-antigen test kits of nasopharyngeal specimens. We analyzed age, sex, and date of reporting according to whether the cases or deaths occurred during the first wave (1st July 2020- 15th September 2020) or the second wave (15th December 2020 to 10th April 2021). We computed Mann-Whitney U test to compare medians of continuous variables and chi-square tests to compare differences between proportions using R.

Results

A total 823 (0.9%) deaths were recorded among 91,378 confirmed cases during March 2020-April 2021 in Zambia. Persons who died were older than those who did not (median age 50 years versus 32.0 years, $p< 0.001$). Although only 4.7% of cases were among persons aged 60 years and over, most deaths (31.6%) occurred in this age group ($p<0.001$). More deaths (83.5%) occurred in the community than in health facilities ($p<0.001$). The case fatality proportion was higher in the first wave than the second wave (2.4% versus 0.6%, $p<0.001$).

Conclusion

During the SARS-CoV-2 epidemic in Zambia, most deaths occurred in the community, indicating potential gaps in accessing hospital care among COVID-19 patients. Identifying and addressing barriers to accessing health care among patients with severe COVID-19 will help blunt the impact of the epidemic in Zambia. As the group most impacted by COVID-19 mortality, older persons might need enhanced outreach and linkage to care.

23. AN ASSESSMENT OF READINESS FOR REMOTE LEARNING AND TEACHING FOLLOWING THE COVID 19 PANDEMIC: CASE OF THE UNIVERSITY OF ZAMBIA -SCHOOL OF NURSING SCIENCES

Scientific Abstract (Oral)

Katowa-Mukwato, P[1]., Chipamaunga-Bamu, S[2], Kwaleyela, C[3], and Mwaba-Siwale C.[1]

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[2] *University of Zimbabwe*

[3] *Mulungushi University*

Introduction

The World Health Organization declared COVID-19 a pandemic on 11 March, 2020. Following the declaration, many countries rapidly implemented measures to limit human interaction and curb the spread of the Disease. Among the measures implemented were closing of schools, colleges and universities as these were seen as potential breeding grounds for COVID-19. With the closures of learning institutions, university authorities quickly resolved to immediately implement and roll-out online teaching as a measure to allow continued teaching and learning. Prior to the COVID-19 Pandemic, the main mode of teaching and learning for full time students at the University of Zambia, School of Nursing was mainly face-to face. The study set out to evaluate the readiness for remote learning and teaching by University of Zambia Nursing Students.

Method

A mixed methods design using a case-study and ADKAR approach (Awareness of the need for change; Desire to participate in and support the change; Knowledge necessary for change; Ability to implement change and Reinforcement to sustain the change) was utilized. Data was collected using an online survey questionnaire administered to Educators, Administrators, Nursing and Medical Students from Six countries across sub-Saharan Africa. Data was collected from September 2020 January 2021. For this abstract, only data from Nursing students and Educators from the University of Zambia is reported.

Results

A total of 194 out of 285 students participated in the survey. Majority (65.3%) of students thought that their learning had partially changed while 33.7% thought it had completely changed due to the COVID-19 pandemic. Similarly, 52.4 % of Educators thought teaching had partially changed while 47.6% thought it had completely changed. All Educators reported that they were confident in the use of software to implement e-learning, while only 43.2% of students were confident that they could use the software needed for remote learning. About 44.8% of students had no reliable electricity, 44.5% had no private space to work/study from and 50% had no good internet connectivity. However, majority of students (68.3%) had a computer and 89.1 had a smart phone to use for remote learning. Only 32% had learning materials needed for remote learning. The major hindrances to remote teaching from the teachers' perspective was not having reliable electricity connectivity as reported by 52.3%, not having private space to work from while at home, (40%) and not having a good internet connectivity as reported by 47.6%.

Conclusion

Challenges to remote learning included electricity disruptions due to load shading, poor internet connectivity, expensive internet bundles, difficulties in concentrating while at home, missed lessons and disrupted clinical placement. Others indicated financial challenges and pointed out that e-learning was expensive as they had to buy internet bundles in addition to paying tuition fees and that some family members who were sponsors had stopped working due to COVID Pandemic. On the other hand, some Educators reported that the crisis became an opportunity to learn and sharpen skills for online teaching despite them facing similar challenges of disruptions in electricity and internet.

24. SEXUAL REPRODUCTIVE HEALTH OUTCOMES AMONG FEMALE ADOLESCENTS DURING THE COVID-19 PANDEMIC IN ZAMBIA

Scientific Abstract (Oral)

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Introduction

Improving access to sexual reproductive health (SRH) and family planning (FP) services to adolescents during the COVID-19 pandemic in sub-Saharan Africa (SSA) remains critical in alleviating the burden imposed by poor maternal outcomes. In resource constrained settings such as SSA, the COVID-19 pandemic has not only threatened economies but also constrained the provision and access to general health and sexual reproductive health (SRH) services among the vulnerable population. Limited access to family planning services can have long-term consequences for sexually active teenagers, including early and unwanted pregnancies, which can lead to poor health, school dropouts, and other social and economic vulnerabilities. Furthermore, teenagers may have limited access to the correct SRH information necessary for making informed health care decisions. Due to their immaturity, sexually active female teenagers are more prone to unwanted pregnancy. This study was conducted to examine the effects of the COVID-19 pandemic on reproductive health outcomes among female adolescents in Zambia. The study generated information that is useful to inform the design and implementation of SRH interventions targeting at improving access to and utilisation SRH services, especially among adolescent girls.

Methods

This study used data from a national household-based survey, namely Socio-economic Impact Assessment of COVID-19 on Households in Zambia (SEIA) which was conducted from March to April 2021. The purpose of the assessment was two-fold; to fill the data gaps on the effects of the COVID-19 pandemic on households in Zambia and provide evidence to inform targeted policy and programmatic responses to the crisis. The survey also collected data on access to family planning services among women. The SEIA survey employed a two-stage stratified cluster sample design. In the first stage, 419 Enumeration Areas (EAs) were selected with Probability Proportional to Size (PPS) of the stratum. A sample of 4,866 female adolescents aged 10-19 years were included in the analysis.

Results

The results revealed that age of adolescents, place of residence, and school going status were statistically associated with pregnancy status and desire for FP services among adolescents during the COVID-19 pandemic. Furthermore, 5% of the adolescents were pregnant during the COVID-19 pandemic period. Only 4% showed the desire for FP services. On the other hand, 8% of the adolescents who fell pregnant missed antenatal care during the pandemic period. Fear of contracting COVID-19 stopped adolescents from accessing sexual reproductive health services from the health facility.

Conclusion

The study has established that COVID-19 impacted adolescents SRH outcomes. The study results highlight the need to improve access to SRH information among adolescents during the COVID-19 pandemic with more emphasis targeting out-of-school adolescents. There is also a need to ensure that during the pandemic period, SRH services are provided to adolescents through community youth friendly services to increase access and utilisation. Use of social media platforms will be key to reaching adolescents with appropriate sexual reproductive health information.

25. DETECTING DEVELOPMENTAL DELAYS IN INFANTS FROM A LOW-INCOME SOUTH AFRICAN COMMUNITY: COMPARING THE BSID-III AND PEDS TOOLS

Scientific Abstract (Poster)

Abdoola, S[1]., Swanepoel, D. W[2]., Van Der Linde, J[3]., and Glascoe, F. P.[4]

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Introduction

Detecting developmental delays is essential for early intervention in low to middle-income countries. Vulnerable populations are at an increased risk of developmental delay. With the advent of the COVID19 pandemic, the use of mobile health (mHealth) approaches as a medium of service delivery is being explored in various healthcare fields. Staff and other limitations can be counteracted by using mHealth to optimize health care services

and resources. The use of mHealth tools is ideal to overcome barriers of access and availability of services and offers the potential to extend clinical services for early detection and thus, the prevention of developmental delays or disorders. The study set out to determine the performance of the Parents Evaluation of Developmental status (PEDS) tools smartphone application (mhealth version) and the Bayley Scales of Infant and Toddler Development III (BSID III) to detect developmental delays in 174 young children aged 3–18 months

Methods

A cross-sectional, within-subject, comparative design was employed. Data were collected at a primary healthcare (PHC) clinic in an underserved high-risk community in South Africa.

Results

The PEDS tools identified 56% (n = 97), and the BSID-III 35% (n = 61) of the 158 children with possible developmental delays, with an overall agreement of 65% between tests. The PEDS tools referral rate was significantly higher ($p = 0.004$) than that of the BSID-III.

Conclusion

The high-risk nature and age group may have contributed to poor agreement across tools. The combined PEDS tools demonstrated improved domain specific outcomes in language, motor and social-emotional domains. A combination of tools for screening and assessment in infants in a PHC context may be necessary.

26. EFFECTS OF ELECTRONIC HEALTH RECORD ADOPTION ON POST COVID-19 SERVICE DELIVERY AT SELECTED HEALTH FACILITIES IN LUSAKA, ZAMBIA.

Scientific Abstract (Oral)

Chilando M[1]

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Introduction

This study aimed at investigating the effects of Electronic Health Record (EHR) adoption of post Covid-19 healthcare service delivery at selected healthcare facilities in Lusaka district, Zambia. While past research had spoken to some aspects of EHR adoption such as EHR design, user behavioral intentions and EHR challenges and risks there were a lot of gaps in the unfathomed areas of EHR adoption which critically affected clinical service delivery during the covid-19 era. This research looked at EHR adoption in terms of performance expectancy and effort expectancy while relating these to three constructs of service delivery i.e., quality of care, health status and efficiency. This study's leading objective was to investigate the effects of EHR adoption on Post COVID-19 service delivery at selected health facilities in Lusaka district, Zambia. The hypothesis of the study was as follows:

H0 – There is no statistically significant effect of EHR adoption on Post COVID-19 service delivery at selected health facilities in Lusaka district.

H1 – There is a statistically significant effect of EHR adoption on Post COVID-19 service delivery at selected health facilities in Lusaka district.

Methods

The study employed a mixed methodological approach which used a parallel convergent research design. The study data was collected from seven randomly selected healthcare facilities in Lusaka district. A sample of 319 respondents was used and the sample was selected through a stratified random sampling technique. A combination of primary and secondary data was collected and analysed in the study. The primary data was collected via questionnaire, focus group discussions and observations while the secondary data was collected from EHR system generated reports.

A Cronbach alpha was calculated to test for reliability of the instruments and internal consistency of the variables. The results for the Cronbach alpha were 0.949 and 0.853 for EHR adoption and service delivery respectively, indicating that the instruments were reliable. Normality and linearity tests were done on the data using Shapiro-Wilk Normality test and linear regression analysis respectively. Pearson's Product Moment Correlation (r) and F test were also undertaken to analyse the quantitative research data. Thematic and Content analysis approaches were employed in the analysis of qualitative data. SPSS IBM was used to analyse the quantitative data while Nvivo was used to analyse the qualitative data.

Results

The results of the Pearson product correlation indicated that there was a small but positive effect of EHR adoption on post covid-19 service delivery at the selected healthcare facilities in Lusaka ($r = .246$, $p < .001$). The dependent variable post covid-19 service delivery was regressed on the predicting variable EHR adoption to assess the conjecture H1. The outcomes from the regression disclosed that EHR adoption significantly predicted post covid-19 service delivery with $F(1,68) = 18.535$, $p < .01$.

Conclusion

The results of the study indicated that EHR adoption had a significant role in the improvement of clinical service delivery. The study also found that there was no statistical evidence that EHR adoption affected the health status and the quality of healthcare even though it affected the efficiency of healthcare service delivery. The study also found that facilitating factors such as the educational qualifications, age and sex of the EHR users had negligible effect on EHR adoption as well as its correlation to healthcare service delivery.

27. CHILDREN WITH SEVERE ACUTE MALNUTRITION'S FEEDING, SWALLOWING AND COMMUNICATION CHARACTERISTICS: AN EXPLORATORY STUDY DURING THE COVID-19 PANDEMIC

Scientific Abstract (Oral)

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Introduction

The perpetuation and exacerbation of malnutrition in vulnerable persons in Africa remained a concern during the Covid-19 pandemic. Much is known about the biological and psychosocial risk factors associated with severe acute malnutrition (SAM), including TB and HIV. Cognitive and motor deficits are associated with SAM, however, there is a lack of research on the feeding, swallowing and communication characteristics which may be impacted in vulnerable children with SAM. The study set out to explore the background, feeding, swallowing, and communication characteristics of vulnerable young children with SAM during in-patient rehabilitation.

Methods

An exploratory, collective case-study design was conducted cross-sectionally with three children, 12-18 months old, independently diagnosed with SAM and treated according to WHO Guidelines for SAM management. All three children were in the rehabilitation phase of nutritional recovery. Background information was collected in caregiver interviews and verified through medical file review. The Rossetti Infant-Toddler Language Scale and the Schedule for Oral-Motor Assessment were used in clinical bedside assessments in June 2021, at a South African tertiary hospital in Tshwane, Gauteng, during the Covid-19 pandemic.

Results

All three cases presented with psychosocial risk factors as well as history of feeding difficulties and short breastfeeding duration. PMTCT failure, HIV and TB co-infection was identified in all three cases. Delayed diagnoses and onset of treatment only at hospital admission for SAM are indicative of breakdown in public health service systems during the pandemic. During the assessments, although pharyngeal swallows were functional, heterogeneous oral-sensorimotor difficulties were identified which may be exacerbated by respiratory symptoms and lethargy related to SAM, TB and HIV. These symptoms are also associated with Covid-19. Risks of oropharyngeal dysphagia warrant dietary consistency modification for the prevention of prolonged nutritional recovery or SAM relapse. Mild-to-moderate language delays were identified, depicting an atypical profile of receptive-expressive language delay. None of the cases were referred for speech therapy.

Conclusions

This research presents a novel description of the oral-sensorimotor skills for feeding, risk for oropharyngeal dysphagia and atypical communication development of three children with SAM. The complexity of concurrent SAM, HIV and TB presentation in the cases is highlighted. PMTCT failure, poor adherence to baby-wellness consultations, late diagnosis and delayed onset of both HIV and TB treatment, as well as short breastfeeding duration reported in this research, highlight the disrupted primary healthcare services where children's weight gain is monitored. This delayed identification perpetuates the quadruple burden of disease in South Africa and highlights the effect of socio-behavioural adaptions made for the Covid-19 pandemic. SLTs could address oral-sensorimotor functioning, feeding difficulties, and communication interaction delays before discharge to community-based management for SAM. SLT involvement may support efforts to improve SAM treatment and recovery in South Africa. Further investigation of feeding, swallowing and communication characteristics of children with SAM is warranted to inform SLT intervention and improved medical team collaboration.

28. THE IMPACT OF COVID-19 AND SUBSEQUENT IMPLEMENTATION OF ACTIVE CASE-FINDING ACTIVITIES ON TUBERCULOSIS NOTIFICATIONS IN ZAMBIA: AN INTERRUPTED TIME SERIES ANALYSIS

Scientific Abstract (Oral)

Lungu, P.S.[1], Kerkhoff, A.D.[2], Muyoyeta, M.[3], Kasapo, C.C.[1], Nyangu, S.[4], Kagujje, M.[4], Chimzizi, R.[1], Nyimbili, S.[1], Khunga, M.[1], Kasese-Chanda, N.[5], Musonda, V.[5], Tambatamba, B.[6], Kombe, C.M.[6], Sakulanda, C.[6], Sampa, K.[6], Silumesii, A.[6], and Malama, K.[6]

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Introduction

The COVID-19 pandemic and national COVID-19 mitigation measures resulted in the disruption of tuberculosis (TB) services in many high-burden, low-income settings.

Objective: We sought to evaluate the impact of COVID-19 pandemic and the subsequent implementation of TB response measures on TB notifications in Zambia.

Methods

We used a single-group interrupted time-series design to compare monthly TB notifications in Zambia before the COVID-19 pandemic (January 2019 to February 2020), to those after the COVID-19 pandemic and national implementation of COVID-19 mitigation measures (April 2020 to June 2020), to those after the implementation of several response measures to improve TB detection (August 2020 to September 2021). TB response measures included: (1) enhanced data-surveillance, (2) facility-based active-case-finding activities, and (3) demand generation activities. The analysis was informed by nationally aggregated, facility-level TB notification data.

Results

Prior to the COVID-19 pandemic, national TB case notifications rose steadily from 2890 in January 2019 to 3337 in February 2020. After the start of the COVID-19 pandemic and implementation of COVID-19 mitigation measures, there was a -21.6% (95%CI: -24.8 to -19.4) immediate decline in national TB notifications in April 2020. Larger immediate declines in TB notifications were seen among HIV-positive compared to HIV-negative individuals (36.3% [95%CI: 34.6 to 37.9] vs. 11.8% [95%CI: 6.0 to 17.5]), adults ≥15 years compared to children <15 years (-22.6% [95%CI: -25.2 to -19.9] vs. -5.3% [95%CI: -20.0 to 9.5]), and individuals with clinically diagnosed compared to microbiologically confirmed pulmonary TB (-28.8% [95%CI: -32.6 to -24.9] vs. -12.5% [95%CI: -17.4 to -7.6]). Eight of ten provinces had immediate declines in TB notifications, but there was substantial heterogeneity in the degree of impact (range:-31.9 to 16.3%). Following the roll-out of TB response measures in July 2020, national TB notifications immediately increased by 44.8% (95%CI: 38.3 to 51.4) and were associated with improvements in notifications across all sub-groups and provinces. TB notifications subsequently remained stable through September 2021, with similar numbers to the predicted number had the COVID-19 pandemic not occurred (4107 [95%CI: 3923 to 4292] vs. 3879 [95%CI: 3631 to 4126]).

Conclusion

The COVID-19 pandemic had a large but differential impact on TB notifications in Zambia. The implementation of a coordinated public health response, including active-TB case-finding strategies, was associated with the reversal of the adverse impact of the COVID-19 pandemic and related mitigation measures, and gains were sustained throughout subsequent COVID-19 waves.

29. THE CHANGING PEDIATRIC HIV EPIDEMIC IN RURAL SOUTHERN ZAMBIA: THE IMPACT OF ADVANCES IN PREVENTION AND TREATMENT AT A DISTRICT HOSPITAL FROM 2007 TO 2019

Scientific Abstract (Oral)

Hamahuwa, M.[1], Moyo, N.[2], Mutanga, N.J[4], Van Dijk, H. J.[3], Hamangaba, F.[2], Schue, L. J.[2], Thuma, E. P.[1,2], Moss, J. W.[2], and Sutcliffe, G. C.[2]

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Introduction

Significant progress has been made in expanding access to services addressing the pediatric HIV pandemic, including programs to prevent mother-to-child transmission, early diagnosis, and care and treatment for children living with HIV. Few long-term data are available from rural sub-Saharan Africa to assess implementation and impact of national guidelines.

Methods

Three cross-sectional studies were conducted evaluating early infant diagnosis in Macha, Southern Province, Zambia from 2010-2019. Maternal antiretroviral treatment, infant test results, and turnaround times for results were summarized by year. One cohort study was conducted at Macha Hospital evaluating pediatric HIV care from 2007-2019. The number and age of children initiating care and treatment, and treatment outcomes at 6 and 12 months were summarized by year.

Results

Receipt of maternal antiretroviral treatment increased from 51.6% in 2010 to 92.9% in 2019, and the proportion of women receiving combination ART increased from 64.9% to 100%. The proportion of infants testing positive decreased from 12.5% to 4.0% and differed significantly by receipt of maternal ART. The turnaround times for returning results to the clinic and then the mother varied, but were

shorter when labs consistently used an SMS system - the median turnaround time decreased from 54 days in 2010-2012 to 36 days in 2014. The proportion of mothers receiving results was similar in 2010-2012 and 2016-2019 at approximately 80-85% but higher in 2013-2015 (95-97%) when a text messaging intervention was piloted to contact mothers when results were available. The number of new children living with HIV and cared for at Macha Hospital increased from 2007 to 2010 and then decreased each subsequent year, to a low of only 9 in 2019. The number of children imitating ART increased, particularly after early infant diagnosis became available in 2008 and after expansion of treatment guidelines to include all children younger than 15 years of age in 2013. Over time, the age distribution of children enrolled into the HIV clinic changed, with more children younger than 1 and 2 years of age enrolling after early infant diagnosis became available in 2008. The proportion initiating treatment with severe immunosuppression and dying within 6-12 months decreased over time. The proportion of children transferring to other clinics was consistently low until 2017 when HIV services were decentralized, and children were transferred to their designated rural health centers to receive care. Loss to follow-up was low throughout the study period.

Conclusion

These studies demonstrate the long-term impact of implementing a strong HIV prevention and treatment program. While expansion and decentralization brought challenges, the program succeeded in decreasing the rate of mother-to-child transmission and ensuring that children living with HIV benefit from access to life-saving treatment.

30. ASSESSING THE EFFECTIVENESS AND FEASIBILITY OF SCHOOL ENTRY AS A STRATEGY FOR IDENTIFYING AND FILLING IMMUNITY GAPS.

Scientific Abstract (Oral)

Dombola, A.M[1]., Hasan, A.Z[2]., Kapungu, K[1]., Prosperi, C[2]., Mufwambi, W[1]., Sakala, R[1]., Chongwe, G[1]., Niehaus, L[2]., Singh, P[2]., Siputuma, K[3]., Mwansa, F[4]., Sakala, C[4]., Kamiji, E[4]., Bobo, P[4]., Truelove, S.A[2]., Moss, W.J.[2], and Mutembo, S[2]

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[2] *Johns Hopkins Bloomberg School of Public Health*

[3] *Ministry of Education Government of Republic of Zambia*

[4] *Ministry of Health Government of the Republic of Zambia.*

Introduction

Schools provide an opportunity to identify and vaccinate children missing critical vaccine doses, especially given the disruption to the routine vaccination system due to the Covid-19 pandemic. While there are policies to check vaccination status at school enrolment, this policy is not routinely implemented partly because there are no operational guidelines on how to implement school vaccination checks. A pilot school-based vaccination screening project was implemented in two districts to identify under-vaccinated and zero-dose children in grade 1 and to assess how to operationalize this practice at school and primary health care levels in Zambia.

Objectives: Assess the feasibility of establishing school-based vaccination checks in two districts in Zambia.

Methods

A cross-sectional study was conducted in Ndola and Lusaka among grade 1 students in 5 purposely selected government and community schools in each district starting 27th June 2022. Data on vaccination history (by under-5 card or caregiver recall) and demographic characteristics were collected through interviews with parents or legal guardians. For students missing at least 1 dose of oral polio vaccine (OPV), pentavalent vaccine (DTP-Hep B-Hib) or measles-containing-vaccine (MCV) were referred for catch-up vaccination through arrangements made by study staff and school headmasters in collaboration with the health centres. We obtained permission from the Ministry of Health to conduct catch-up vaccinations for students identified during this pilot study because the Expanded program on immunizations manual does not include children above 5 years despite available guidelines from the World Health Organization.

Results

As of 21st June 2022, of the 1879 (1080 in Ndola; 799 in Lusaka) students in grade 1, 89% (90% in Ndola; 88% in Lusaka) parents accepted to enrol their children in the study. The median age for enrolled students was 8 years old (range: 5, 15 years). Among those enrolled in the study, 57% had some form of pre-school education (56% in Ndola; 59% in Lusaka). About 74% (73% in Ndola; 76% in Lusaka) had an under-5 card available for screening though this varied by school. Vaccination coverage reported by card or recall was 94% for the third dose of pentavalent vaccine, 90% for the

first dose of MCV (MCV1) and 68% for MCV2. About 8% of students were zero-dose for MCV and 2% for pentavalent vaccine. Overall, almost 38% students screened were referred for catch-up vaccination. About 93% parents of under-vaccinated students reported willingness to have their child receive a catch-up dose at school by a health facility staff.

Conclusions

Most of the parents agreed to let the school system check the vaccination history of their children in grade 1. Our study identified zero-dose children and large proportions of under-vaccinated children for MCV and other vaccines in grade 1, which contributes to immunity gaps and could increase risk for vaccine-preventable disease outbreaks. Therefore, school vaccination screening can provide an additional touch point to identify zero-dose and under-vaccinated children needing catch-up vaccine doses.

31. COMPARATIVE PERFORMANCE ASSESSMENT OF APPROACHES TO HPV TESTING FOR CERVICAL CANCER SCREENING IN ZAMBIA

Scientific Abstract (Oral)

Samboko, M[1]., Nyangu, J[1]., Hebert, K[1]., Demke, O[1]., Shakwelele, H[1]., Kamfwa, P[2]., Siamalambwa, Q[3]., Mpumba, G.M[4]., Maingaila, V[5]., Mubanga, F[6].,and Haimbe, P[7]

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[6] *Chipata Central Hospital, Ministry of Health, Zambia*

[7] *Clinton Health Access Initiative*

Introduction

In Zambia, cervical cancer ranks as the most frequent cancer among women of all ages and the most frequent cancer among women between 15 and 44 years of age. In 2020, the country recorded an estimated 13,831 new cancer cases of which 3,161 (22.9%) were cervical cancer. In 2020, the World Health Organization launched the global strategy to accelerate the elimination of cervical cancer as a public health problem and recognized HPV testing as an essential primary screening tool for cervical cancer elimination. Zambia validated HPV testing in 2019. Speckled performance has been noted across the various platforms and this has affected patient management and follow up. the objective of this evaluation was to assess the operational performance of two HPV testing platforms, a near POC platform (GeneXpert) and a centralized platform (Hologic Panther). The assessment sought to understand the performance of these platforms in terms of their linkage to care and turnaround times (TAT) for HPV results as well as to understand operational challenges and facilitators to each approach.

Methods

Retrospective aggregate HPV testing data was collected for a six -month period between October 2021 and March 2022. Cervical cancer registers and logbooks from 37 health facilities and 11 laboratories in Eastern and Southern Provinces of Zambia were reviewed. Laboratory data provided information on laboratory technology and infrastructure requirements, sample processing and results cascading. Health facility data provided information on linkage to care, sample referral and results cascading information. Data analysis was descriptive in nature.

Results

Of the 37 health facilities, 28 utilized centralized HPV testing platforms and 9 utilized near POC platforms. Of the 11 laboratories, 2 used centralized platforms and 9 used a near POC system. Between October 2021 and March 2022, preliminary data analysis shows that a total of 7,253 HPV samples were collected from 37 facilities; 2,883 were sent to a near POC platform and 4,370 to a centralized platform. Approximately, 25% of the samples sent to a centralized platform were HPV positive and 35% of samples sent to a near POC platform were HPV positive. The proportion of HPV positive women who came back for visual assessment for treatment was similar among both testing platforms, around 75%. Linkage to treatment for eligible women was slightly higher among women whose samples were processed using the centralized platform (100%) versus a near POC

platform (98%). All 9 laboratories using the near POC platform reported an average TAT of 1 day, whereas the average TAT was longer for laboratories using a centralized platform. Of the two laboratories using a centralized platform, one reported an average TAT of 7 days and the other reported a TAT of 30 days.

Conclusion

Operational performance of near POC and centralized HPV testing platforms revealed similar outcomes in terms of linkage to care and treatment. Large differences were noted in the TAT for the two platforms, but interestingly that does not appear to influence patient follow-up.

32. HYGIENE PRACTICES IN THE ERA OF COVID 19; EXPERIENCES OF PERSONS WITH DISABILITY AND OLDER PEOPLE

Scientific Abstract (Poster)

Nyirenda, H.C.,[1] Nyasa, M. [1] and Sharma, A. [1]

[1] Center for Infectious Disease Research in Zambia (CIDRZ)

Introduction

Globally, 15% of persons living with different forms of disability which affect them socially, economically, and culturally, and limits their effective and equal participation in society. People with disability and older people [>50 years old] face challenges with maintaining good hygiene due to their physical and/or cognitive limitations. During the COVID-19 pandemic, Interventions were established to address these challenges and support those with disability and the elderly to practice hygiene behaviours including those specific prevention of COVID-19. This abstract shares insight into experiences of these minority populations concerning their hygiene practices in the era of COVID-19.

Methods

The study used In-depth interviews (IDIs) to gather experiences of people with disabilities, older people, their caregivers, and community members, concerning their hygiene practices during COVID-

19. In June and July 2022, three researchers conducted a total of 32 IDIs in Monze-Southern Province, Samfya-Luapula Province, and Mwandi-Western Province including ten people with disabilities, six with older people, six with caregivers of people with disabilities and six of older people, and four with community members. Interviews focused on experiences in managing personal hygiene, access to hygiene promotion messages during COVID-19, and access to hygiene kits and hand washing facilities for people with disability and older people. Interviews lasted between 20-60 minutes and were conducted at times, locations, and languages convenient for participants. We conducted a thematic analysis using deductive reasoning based on the Medical Research Council Framework on process evaluation along with inductive reasoning to identify serendependious insights.

Results

Managing personal hygiene: Most respondents reported challenges of water supply in their homes and intermittent lack of hygiene aids like soap and hand sanitiser for all household members irrespective of age and ability. Most stated that, when possible, they increased hygiene practices during COVID-19 because they wanted to protect themselves from COVID-19 infection. They felt that being supplied with hygiene products like soap and hand sanitiser and bringing water closer to them would help them practice hygiene easily.

Access to hygiene promotion messages: All groups shared that they had access to hygiene promotion messaging from at least one or more sources, most commonly, radio and television. The health facility, healthcare workers and posters in the community were other sources of information.

Hygiene kits: Most respondents said they had not received hygiene kits or seen hygiene kits provided to anyone in their community, those that received kits mostly got masks.

Hand washing infrastructure: Most respondents reported the installation of hand washing infrastructure in community places like clinics, markets, shops, and schools since COVID-19, which some had been able to use with minimal challenges. All respondents, however, shared that they were not involved in the design and construction of the hand washing infrastructure in their locations.

Conclusion

Most people with disabilities and older people have access to hand hygiene information but require hygiene aids to facilitate their practice of recommended hygiene behaviour and were not part of design and construction teams that build hand washing facilities in their communities.

33. PREVALENCE OF SARS-COV-2 ANTIBODY SEROPOSITIVITY AMONG PERSONS AT RISK FOR TUBERCULOSIS IN A HIGH HIV-BURDEN SETTING: LUSAKA ZAMBIA.

Scientific Abstract (Oral)

Sanjase, N.[1], Shuma, B.[1], Maimbolwa, M.[1], Somwe, P.[1], Kagujje, M.[1], and Muyoyeta, M.[1]

[1] Centre for Infectious Disease Research in Zambia

Introduction

COVID-19 has become the leading cause of death and morbidity globally and Sub-Saharan Africa is no exception. Several African countries have demonstrated over 50% seropositivity for COVID-19 IgM/IgG antibodies, despite reporting lower number of COVID-19 cases due to low testing. Patients with previously unknown COVID-19 infection presenting with post-acute sequelae of COVID-19 whose clinical features overlap with TB can be inappropriately diagnosed with presumptive TB due to overlap of symptoms.

Specific Aims: To determine the sero-positivity of COVID 19, and to explore factors associated with TB diagnosis among presumptive TB patients in three health facilities in Lusaka.

Method

We analyzed data from an ongoing prospective cohort study 'Validation of Google artificial intelligence enabled TB and covid screening and TB diagnosis in Zambia'. The purpose of the study is to investigate the value of Google's TB algorithm, normal vs. abnormal, COVID-19 algorithm, for use as a triaging test amongst presumptive TB patients to reduce the total cost of diagnosis and increase patient throughput. At enrolment, a digital Chest Xray, clinical history, physical examination

and a rapid covid antibody test were done. Additionally, sputum samples were collected from all participants for Microscopy, TB Gene Xpert and culture to aid in TB diagnosis.

Results

Of the 1706 participants enrolled to date 44.4 % were male and the median age was 35 years (IQR 27-45 years). The overall COVID-19 seropositivity among TB presumptive participants was 43.6 %; Females had a higher seropositive than males, 60.3 % compared to 39.7 % COVID- 19 seropositivity respectively. Covid sero-positivity was significantly associated with being female, age between 50-60, and self-reported close contact to a COVID -19 patient, adjusted odds ratios, 1.33 (95%CI 1.04-1.69), 1.61 (95%CI 1.19-2.19), and 3.04 (95%CI1.44-6.42) respectively. There was no association between TB diagnosis and COVID seropositivity.

Using Pearson's correlation test, Computer aided diagnosis scores was not correlated with covid seropositivity at 0.0358 rho.

Conclusion

The prevalence of COVID19 seropositivity among TB presumptive patients was high in this cohort with females, those who reported household contact of Covid and those aged between 50-60 having a higher likelihood of exposure to covid 19. However, the there was no association between TB diagnosis, whether bacteriologically confirmed or clinically diagnosed, with Covid 19 seropositivity, and CAD scores were not correlated with Covid seropositivity status. Patients presenting with TB symptoms need to be further evaluated for possible post-acute sequelae of Covid as well as other chronic lung diseases.

34. CHARACTERISTICS AND CLINICAL PRESENTATION ASSOCIATED WITH COVID-19 DIAGNOSIS AMONG INDIVIDUALS ATTENDING COMMUNITY HUBS IN ZAMBIA

Scientific Abstract (Oral)

Nyangu, S[1]., Gaiche, T[1], Ooko, M[2]., Floyd S[2]., and Shanaube, S[1]

[1]Zambart

[2] *London School of Hygiene and Tropical Medicine,*

Introduction

COVID-19, caused by the novel severe-acute-respiratory-syndrome-coronavirus-2 (SARS-CoV-2), is responsible for over 580 million COVID-19 cases and over 6 million deaths (case-fatality-rate of 1.1%) reported globally during 2020-2022. Zambia reported 329,483 confirmed cases, 4,015 deaths (case-fatality-rate of 1.2%) as of 14th August 2022. Studies to assess individual-characteristics and clinical-presentations of COVID-19 cases are critical to furthering our understanding of the virus as well as predicting and managing the course of the epidemic. The aim of the project was to understand the individual characteristics and clinical presentation of people diagnosed with COVID-19 in a peri-urban community to help increase the knowledge of SARS-CoV-2 in the Sub-Saharan African region, and inform strategies for screening, diagnostic, and care services.

Methods

TREATS-COVID was a cross-sectional-study nested within an on-going TREATS clinical-trial carried out from September-2020 to April-2021 for Phase-I and May-2021 to October-2021 in Phase-II in Ngungu/Bwacha peri-urban community in Zambia. In Phase-II, COVID-19 testing was offered at community hubs to everyone who attended, whether symptomatic for COVID-19 or not and a total of N=3,338 participants aged ≥15 years were enrolled. COVID-19 diagnosis was made using PCR and Rapid-Antigen-testing. Data was analysed using logistic regression.

Results

Out of the 3,338 participants, 1,895(57%) were males and 1,443(43%) were females. A total of 398 tested positive for COVID-19(11.9%), 205(52%) were females and 193(48%) were males. There was strong evidence of an association with COVID-19 diagnosis for the following characteristics and the highest odds(Adjusted-OR) were: Females-1.46(1.16,1.84), Age group 30-39yrs-1.29(0.79,2.13) compared with age 20-29 years, Higher-education 2.85(1.81,4.49), indoor-employment-2.22(1.44,3.42), and having a household member with COVID-19-3.56(2.65,4.47). When stratified by age groups, having a household member with COVID-19 put the 15-19 years olds at 7.5 times higher odds [adjusted-OR 7.5 (95%CI 3.86-14.8)] for COVID-19 diagnosis compared to the 20+ year olds [adjusted-OR 2.92(95%CI 2.08-4.1)].

Among the 398 people who tested positive for COVID-19, 206 (51.8%) participants were symptomatic whereas 192 (48.2%) were asymptomatic. Cough was the commonest symptom reported: COVID-19 positive- cases(51.5%) and COVID-19 negative-cases(12.2%). The most common symptom combinations frequently reported were cough & fever 29(14%) followed by cough & loss of smell (8.7%) then cough, fever & loss of smell (8.3%). Among those that tested COVID-19 positive, the more symptoms an individual had, the greater the probability of COVID-19 diagnosis: for 1 symptom (21%), 2 symptoms (37%), 3 symptoms (38%), 4 symptoms (45%) and 5 symptoms (89%), reported as row percentages.

Conclusion

Better understanding of certain individual characteristics that predispose individuals to a high risk of COVID-19 diagnosis, their symptoms and an identified combination of symptoms mentioned above may serve as important ;7! indicators to identifying patients with COVID-19 and this would facilitate prompt identification of cases and treatments. Additionally, this could help increase the knowledge of SARS-CoV-2 in the Sub-Saharan African region, and inform strategies for screening, diagnostic, and care services.

35. EFFECTS OF ORGANIZATIONAL CULTURE ON HEALTHCARE PROJECT MANAGEMENT: A STUDY OF COVID-19 VACCINATIONS AT UTH IN LUSAKA, ZAMBIA.

Scientific Abstract (Poster)

Kanyinda, P.[1], Rameez, H.[1], and Kaluba, C.[2]

[1] University Teaching Hospital

[2] National Institute for Public Administration

Introduction:

This study was based on effects of organizational culture on healthcare project management at the University Teaching Hospital in Lusaka District of Zambia. The main purpose of the study was to assess the effects of organizational culture on healthcare project management at UTH in Lusaka, Zambia. Specifically, the study assessed the influence of organizational culture on project management; the effect of employee recognition on project management; the impact of leadership on organizational culture in regard to project management and the influence of communication system on project management at UTH.

Methods:

A case study approach was adopted for this study and employed a qualitative method. Purposive sampling technique was used to select the 30 participants. Data was gathered using semi – structured interviews. Data was analyzed thematically.

Results:

The following findings came out of the study: the influence of organizational culture on project management was linked to the better project performance; the effect of employee recognition on project management at UTH is that employee recognition motivates the employees and makes them feel valued for their work and hence contributing to the success of the project; the impact of leadership on project management at UTH was very important in a project because good leadership plans, and directs how a project should go in order to accomplish its mission and that the influence of communication system on project management at UTH is that communication has the power to promote efficiency and effectiveness in the project because people are able to relate well and execute the project objectives in a coordinated manner.

Conclusion:

The study concluded by recommending that organizational culture has the power either to affect the project positively or negatively. In this regard organizations' heads should come with an organizational culture that will influence the members of the project positively in order to achieve the aim of the project successfully.

36. POOLED ESTIMATE OF RISKY SEXUAL BEHAVIOR AMONG COLLEGE AND UNIVERSITY STUDENTS IN SUB-SAHARAN AFRICA: A META-ANALYSIS

Scientific Abstract (Oral)

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[1] University of Lusaka, Lusaka

[2] Workers Compensation Fund Control Board

[3] Zambia National Public Health Institute

Introduction

Generally Risky Sexual Behavior (RSB) refers to an act that increases one's risk of contracting sexually transmitted infections and unintended pregnancies. There is a lack of meta-analysis studies on the subject. Hence, the aim of this study was to establish the pooled estimate of risky sexual behaviour among university and college students in sub-Saharan Africa.

Methods

A meta analytic study conducted to identify predictors of risky sexual behavior among university students. Databases from PubMed, African Journals Online, Science Direct, Google Scholar were used to identify appropriate studies. The combined effect estimates for each outcome were computed in Meta XL using random effects.

Results

The estimated pooled prevalence of sexual activity among university students was 51.0% (95% CI: 43.0%-59.0%). Pooled prevalence for multiple sexual partners was 36.0% (95% CI: 30.0%-42.0%), inconsistent condom use, 53.0% (95% CI: 46%-61.0%) and for at least one risky sexual behavior, 65.0% (48.0%-81.0%). Males were 3.36 times [OR: 3.05; 95% CI: 2.59–4.37] more likely to have multiple sexual partners than females. This review also indicated that males were 2.99 times [OR: 2.99; 95% CI: 1.40–6.40] more likely to engage in at least one risky sexual behavior than females.

Conclusion

Inconsistent condom use and multiple sexual partners were the most rampant risky sexual behaviors in Universities in Sub-Saharan Africa. Sustained risk communication on Sexual and Reproductive Health and youth friendly programs are highly recommended.

37. COVID-19 PANDEMIC THROUGH THE LENSES OF NURSES AND MIDWIVES IN ZAMBIA: EXPLORING DEPRESSION, ANXIETY AND STRESS

Scientific Abstract (Oral)

Mwape, L.[2], Lyambai, K.[1], Chirwa, E.[2], Mtonga, M.[2], Mukwato – Katowa, P. [1], and Lloyd, A.[3]

[1] University of Zambia, School of Nursing Sciences, Lusaka, Zambia

[2] Levy Mwanawasa Medical University, School of Nursing Sciences, Lusaka, Zambia

[3] Lusaka District Health Office

Introduction

Following the declaration of COVID-19 as an international health emergency, Zambia, like many other countries, implemented measures to limit human interaction and curb the spread of the Disease. In the midst of these measures, nurses and midwives continue to provide care to suspected and confirmed cases of COVID-19, which puts them at risk of contracting the disease and compromising their psychological wellbeing. The aim of this study was to assess the levels of depression, anxiety, and stress experienced by nurses and midwives during the COVID-19 pandemic working in health facilities in two districts of Zambia.

Method

This descriptive cross-sectional study involving 187 nurses and midwives was conducted between July and December 2020 in selected health facilities in Lusaka and Chilanga Districts. The Depression Anxiety and Stress Scale (DASS) 21 was used to collect the data which was analysed using univariate analysis.

Results

Majority of the respondents were female (84%) and mean age at 30.1 (SD 9.05) years, 58.3 percent were married, and 50.84 percent had children. The mean work experience was 6.63 (SD 4.75) years, and 54 percent had worked for less than five years. Overall, 22.5 percent of nurses and midwives reported depression, 52.4 percent had anxiety and almost half (42.2%) had varying levels of stress. Anxiety and stress correlated significantly with working in COVID Isolation departments ($P = 0.000$). Strategies such as strict adherence to infection prevention measures, seeking help from family and friends and recognition by hospital management were a significant supportive measure ($P<0.001$).

Conclusion

Nurses and Midwives working directly with COVID-19 patients reported greater incidence of depression, anxiety and stress, similar to findings from previous research around the world. Thus, efforts should be focused on developing and providing counselling and other support services to mitigate the effects of COVID-19 and enhance psychological wellbeing for these professions.

38. THE EFFECT OF COVID-19 ON MEASLES-1 IMMUNIZATION ATTENDANCES DURING ROUTINE CHILDHOOD IMMUNIZATION IN ZAMBIA: A CROSS-SECTIONAL STUDY.

Scientific Abstract (Oral)

Ntebeka, Bristol M.,[1] Jacobs, Choolwe N.,[1] and Sampa, Mutale K[1]

[1] University of Zambia

Introduction

More than 3,000 under-five children die every day from vaccine preventable disease around the world. The burden of under-five mortality is high in low- and middle-income countries, such as Zambia in the sub-Sahara African region, compared to other developed countries. Evidence shows that the measles vaccine, which is also the determinant for a child to be considered fully immunized, significantly reduces the number of children who die from vaccine preventable disease. However, the Covid-19 negatively affected primary health care and routine immunization. This study was aimed at

investigating the effect of Covid-19 on measles-1 immunization attendances during routine immunization in Zambia. This study's objective was to evaluate the effect of the covid-19 on attendances of Measles-1 immunization during routine childhood immunization in Zambia.

Methods

This was a cross-sectional study, District Health Information systems (DHIS2) data from 2017 to 2020 in Zambia was used. The Covid-19 period in Zambia was considered to have started from march 2020. Graphical analysis were done to estimate and describe the trends of measles-1 immunization attendances in Zambia. Results from the mixed effects ML regression were used to estimate the effect of Covid-19 on measles-1 immunization attendances, and predict the expected observations.

Results

A total of 5,568 observations were analysed from all the 116 districts and 10 provinces of Zambia. A statistically significant drop of 48 and 62 in the number of measles-1 immunization attendances was observed in the first and second months of the Covid-19 period. The study also reviewed that there were drops in measles-1 immunization attendances recorded in all the provinces of Zambia during the Covid-19 period. Rural areas were observed to have recorded the highest drops compared to urban areas of residence.

Conclusion

Covid-19 negatively affected measles-1 immunization attendances during routine childhood immunization in Zambia. It is critical to proactively address the effects of Covid-19 on routine childhood immunization if we are to meet the SDG goals by 2030.

SUSTAINABLE DEVELOPMENT AND HEALTH

39. IMPROVING VIRAL LOAD COVERAGE AT NANGA RURAL HEALTH CENTRE IN MAZABUKA DISTRICT

Best Practices Abstract (Oral)

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[1] Nanga Rural Health Centre, Mazabuka District, P.O Box 670080

Introduction

The Ministry of Health has a goal to end the AIDS epidemic by 2030, by adopting the 95–95-95 UNAIDS goals, the third 95% requires that all people on ART achieve and maintain virologic suppression, it is critical to optimize ART adherence for all patients in order to ensure this level of virologic suppression. Viral load (VL) testing is a crucial tool for clinical and programmatic monitoring. Nanga Rural Health Centre has had a fluctuating coverage in terms of VL sample collection with the facility coverage being 88% at the end of September 2021. This coverage was low as compared to the target of 95%. With the facility enrolled into the quality improvement initiative, the aim was to determine the causes for low performance and improve the Viral load Coverage from 88% to 95% by September 2022.

Methods

This was a study conducted at Nanga rural health center. A retrospective audit and root cause analysis using the fish born method was conducted to assess VL coverage prior to the month of October 2021. After carefully analyzing the root causes, the following interventions were implemented from October 2021 to June 2022 (post-implementation); generating of appointments list for those due and proactively sending of appointment reminders. Harmonization of appointments by bleeding clients ahead of schedule was done and it helped to avoid missed viral load appointments that were due to pharmacy pickup. Educating the clients on the importance of VL on every visit through health education and during one on one interaction during drug pick up. Descriptive statistics were used using excel.

Results

The results achieved from the methods show a consistent rise in the coverage. The implemented ideas helped the facility to follow up and closely monitor clients due for viral load collection; it gave the facility an advantage of filling in the gaps of those missed for collection by bleeding clients ahead of

schedule. Although a drop of 3% can be noted in October from the baseline of 88% and also in the month of March, The VL Coverage improved by 7% from 88 % in September 2021 (pre-implementation) to 96% as of June 2022 (post-implementation) after the intervention.

Conclusion

With the great improvement in Viral Load coverage, it can be concluded that the methods used worked for the benefit of the facility in achieving the target of 95% coverage. One on one interaction with clients' improved their understanding of the importance of Viral Load sample collection. It is recommended that proactive daily monitoring be enhanced as it quickly identifies clients that missed appointments and make it easy to initiate follow up immediately. It is also recommended that patient files be updated each time results are received at the facility. It is further recommended that facilities conduct data reviews to quickly detect trends in VL coverage.

40. IMPROVING VIRAL LOAD COVERAGE AT MUKUYU RURAL HEALTH CENTRE IN MAZABUKA DISTRICT

Best Practices Abstract (Oral)

Mudenda, P.[1], Mwela, A.[1], Ntutuma, D.[2], Mwaangwe, H.[1] and Simusokwe, R.[2]

[1] Mukuyu Rural Health Centre

[2] Mazabuka District Health Office,

Introduction

The United Nations Programme on HIV/AIDS (UNAIDS) 2020 Global strategy to reduce the transmission of HIV includes ensuring HIV viral load (VL) Suppression is at least 95% on all patients on antiretroviral therapy (ART). Routine VL monitoring has been shown to result in earlier detection of treatment failure, timely regimen switches, promotion of adherence to treatment and improved survival. For a good Viral load suppression to be attained, viral load coverage plays a key role, however, the VL coverage at the facility was low at 77% as of September 2021 against the target of 95% giving a performance gap of 18%.

Aim: To determining the root cause of low VL coverage and implementing Strategies to improve the coverage from 77% to 95% by September 2022.

Methods

This was an interventional study conducted at Mukuyu rural health center. A retrospective audit of monitoring and evaluation reports , patients file and root cause analysis using the fish bone diagram to asses VL coverage prior to the month of October 2021 (pre-implementation). An intervention model was developed based on the root cause analysis and implemented from October 2021 to June 2022 (post-implementation). Descriptive statistics were used using excel.

Results

Effective follow-up of viral load results, proper documentation of VL results in patient's files and SMART CARE within 24hours of receipt, a proactive appointment system and good customer care is indeed critical to achieving the required results. The results shows that there is massive improvement in VL coverage at Mukuyu RHC. At the start of this initiative, the performance gap was at 18%. The VL Coverage improved by 15% from 77 % in September 2021 (pre-implementation) to 92% as of June 2022 (post-implementation) after the intervention, closing the performance gap to 3%. We hope to meet and surpass the set target of 95% by September 2022.

Conclusion

It is true that quality health services combined with good customer care attract clients to the facility. This was clearly seen through this QI imitative, clients were very cooperative and came to have their viral load samples collected without fail when called upon. Problems identification and solving skills should indeed be embraced by all health workers in order to serve the clients better. The facility will continue implementing the strategies until the target is achieved. It is therefore recommended that all health workers provide good customer care to win the hearts of the clients and make them come to the facility for VL sample collection. It is also recommended that clients who are unable to come to the clinic due to various reasons are followed to their homes for samples collection. It is further recommended that proper documentation of VL results in files and smart care must be done within 24hours of result receipt.

41. IMPROVING VIRAL LOAD COVERAGE AT MUGOTO RURAL HEALTH CENTRE IN MAZABUKA DISTRICT

Best Practices Abstract (Oral)

Chanda, P.[1], Chilala, M.[1], Sibeso, B.[1], Ntutuma, D.[2], and Simusokwe, R[2].

[1] Mugoto Rural Health Centre,

[2] Mazabuka District Health Office

Introduction

Mugoto Rural Health Centre is a medium volume facility located in Mazabuka District, about 69 kilometers from town accessed by road, with the majority of the population owing businesses of selling goat meat at the tarred road and farming. The facility has a headcount of 4020 according to the Central Statistical Office (CSO), and Treatment Current (TX CURR) of 426 as of July 2022. Routine HIV Viral Load (VL) monitoring of all eligible clients on the TX CURR has been shown to result in earlier detection of treatment failure, timely regimen switches, promotion of adherence to treatment and improved quality of life. However; VL coverage at the facility was low at 59% according to SMARTCARE as of December 2021 and this was against the target of 95%, giving a performance gap of 36%. The study set out to determine the root cause of low VL coverage and implement a problem-solving model to improve the coverage from 59% to 95% by September 2022.

Methods

This was an interventional study conducted at Mugoto rural health center in Mazabuka district. A thorough audit of the Monitoring and Evaluation Reports (MER), patient files and root cause analysis using the Fish Born analysis was conducted to assess VL coverage prior to the month of December 2021. An intervention model was developed based on the root cause analysis and implemented from December 2021 (pre-implementation) to September 2022 (post-implementation). Descriptive statistics were used using excel.

Results

The thorough audit and root cause analysis using the flow chart analysis, revealed the causes of the low VL coverage, these included; no person responsible for the use of Smart-care database, Poor documentation of Viral Load results in patient files and Smart-care, knowledge gap on the terms of

reference of the Viral Load champion and Mother and Child Health indicators, Poor Turn around for VL Results, Inadequate patient locator details, wrong addresses and phone numbers given. VL coverage improved by 14% from 59% pre-implementation to 73% post-implementation after the intervention.

Conclusion

The investigation of problems associated with low VL coverage against target using the flow chart analysis was successful as the beginning of the project in December strategies were implemented to rectify the gaps identified and these are still being implemented until the target is achieved. Because of high Fluctuations of VL coverage due to the expiry of the documented results close monitoring of the indicator is critical. It is recommended that facilities Introduce after hour appointments with clients for VL sample collection especially clients with busy work schedules. It is also recommended that clients who are unable to come to the clinic due to self-stigma or illness are followed to their homes for sample collection.

42. UNDERSTANDING DETENTION PERIODS, BARRIERS TO HEALTH AND EXPEDITING CASE DISPOSAL FOR INCARCERATED JUVENILES IN ZAMBIA.

Best Practices Abstract (Oral)

Thornicroft, M.M.[1], Moonga, C.N.[1], Kabaghe, T.[1], Hatwiinda, S.[1], Zgyambo, T.[2], Kagujje, M.[1], and Muyoyeta, M.[1]

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[2] Health Directorate, Zambia Correctional Service, Ministry of Home Affairs and Internal Security, Lusaka, Zambia

Introduction

Globally, it is estimated that over 1 million children are in conflict with the law and their rights infringed upon and many receive disproportionate sentences that violate international law. In this

study we sought to determine the detention period of juvenile offenders in adult correctional facilities and to identify barriers to speedy case disposal for juveniles.

Method

This was a cross-sectional study that gathered and assessed quantitative and qualitative data from two juvenile facilities in Southern province of Zambia and 10 correctional facilities located in 9 different districts of Zambia. The data collected included the period the juveniles were detained in adult correctional facilities before transfer to appropriate institutions, and factors contributing to delayed case disposal. Data was collected between February and December 2019.

Results

A total of 199 male juveniles were enrolled in the study. The median age was 17 years (IQR 16-18). The majority, 87.4% (174/199) were aged 15-19 years and the rest were aged below 15 years. The median time spent in an adult facility was 332 (IQR 231-514). Reasons contributing to long periods of detention in adult facilities included poor case documentation, limited number of High Court sittings in districts without resident judges, limited resources in the social welfare office to facilitate home visits for background checks and report generations and lack of witnesses in the cases for juveniles.

Conclusion

It was evident that despite Zambia being a signatory to international treaties on children's rights and having all the legal frameworks in place to provide appropriate services for this population, the child justice system in Zambia continues to fail the children in conflict with the law. Holistic and juvenile appropriate health services cannot be provided as long as the Juveniles continue to be incarcerated in inappropriate facilities and for prolonged periods. However, it was demonstrated by this project that expedition of juvenile case disposal and provision of holistic and juvenile appropriate health services within the Zambian justice system is feasible.

43. IMPROVING FULLY IMMUNISED UNDER TWO YEAR'S COVERAGE AGAINST MEASLES RUBELLA TWO AMIDST COVID 19 IN MAZABUKA DISTRICT

Best Practices Abstract (Poster)

Moonga, H.A.,[1] Bweenje, F.,[1] Ntutuma, D.,[1] Chiswida, O.,[1] and Mwaba, P.[1]

[1] Mazabuka District Health Office

Introduction

Zambia is moving in line with the global vision of achieving a world without measles, rubella and congenital rubella syndrome. While the other continents have made significant headway in eliminating the two diseases, Africa remains far behind. According to the latest immunisation data for Zambia, only few districts, have a coverage of above 95% for first dose of the measles containing vaccine while the rest fall below the stipulated coverage. The introduction of Measles and Rubella (MR) vaccine in Zambia is in line with the recommendation by the World Health Organization that countries should take the opportunity offered by accelerated measles control and elimination activities to introduce rubella-containing vaccine (RCV) as either MR or measles-mumps-rubella (MMR) vaccine. The program has an aim of achieving at least 95% measles rubella first dose coverage at national and district level. However, the coverage for Mazabuka was below the 95% set target.

Aim: To determine the root cause of low fully immunized under 2 year's coverage and improve the coverage from 74.3% in 2021 to 95% by December 2022, representing a 30% coverage gap.

Methods

This was an interventional study conducted in Mazabuka district. A retrospective audit and root cause analysis was conducted to assess number of information disseminated programs prior to the month of January 2022 (pre-implementation). An intervention model was developed based on the root cause analysis and implemented from January 2022 to December 2022 (post-implementation). Descriptive statistics were used using excel.

Results

Mazabuka district is indeed moving in line with the national vision of achieving a Zambia without measles, rubella and congenital rubella syndrome. The results for 2021 and 2022 were compared. The results show that the district recorded a coverage of 65% in quarter one of 2021 against target (pre-implementation) as compared to 73% against target) quarter one of 2022 (post-implementation) representing an improvement of 8% after the intervention. The implementation is still ongoing and the data for quarter two will be analyzed and compared.

Conclusion

As shown in the results, there is an improvement in 2022 as compared to 2021 this far, at this pace, our desire is to close the remaining 22% gap by the end of the year. With good planning, execution of the identified strategies and increased capacity among the health workers through training including community involvement and participation, the target can be achieved. It is therefore recommended that districts track the children who received MR 1 to ensure they all receive MR 2 using community tracking registers by community-based volunteers to enhance follow up. It is also recommended that facility Track weekly performance against the targets. It is further recommended that's follow up be done to facilities not meeting weekly targets and appreciate the challenges then offer possible solutions.

44. ENHANCING NUTRITION ASSESSMENT USING HEIGHT AND LENGTH IN CHILDREN UNDER FIVE YEARS IN MAZABUKA DISTRICT IN SOUTHERN PROVINCE

Best Practices Abstract (Poster)

Maliseni, M.,[1] Hanguwa, A.M.,[1] Ntutuma, D.,[1] Chiswida, O.,[1] and Mwaba, P.[1]

[1] Mazabuka District Health Office

Introduction

In Zambia, the prevalence rate of stunting is 35 per cent (DHIS 2018). A further 9 per cent of children have a low birth weight of less than 2.5 kg. This is an indication of lower than normal development

before birth, which can be a result of maternal malnutrition. A large number of new-borns are not weighed at birth, missing the opportunity to detect maternal malnutrition. Micronutrient deficiencies are common among children in Zambia, hence nutrition assessment using Height and length is very important in identifying malnourished individuals because it helps to detect malnutrition in children. However, the coverage for nutrition assessment for Mazabuka district was below the 80% set target. The study set out to determine the root cause of low Nutrition assessment using height and length to improve the coverage from 61% in 2021 quarter one to 80% by December 2022, representing a 19% coverage gap.

Methods

This was an interventional study conducted in Mazabuka district. A retrospective audit and root cause analysis was conducted to assess number of information disseminated programs prior to the month of January 2022 (pre-implementation). An intervention model was developed based on the root cause analysis and implemented from January 2022 to December 2022 (post-implementation). Descriptive statistics were used using excel.

Results

Systems of nutritional assessment can employ a wide variety of specific methods, using height and length has proved effective in the district with evidence from obtained results so far. The 2021 results are available to compare with the 2022 results. The results show that the district recorded a coverage of 61% in quarter one of 2021 against target (pre-implementation) as compared to 74% quarter one of 2022 against target (post-implementation) representing an improvement of 13% after the intervention.

Conclusion

Children are the future generation of any community on planet earth as such premature deaths due to malnutrition should be avoided at all cost. Mazabuka district is working tirelessly to ensure that nutrition assessment is done with proof in the results achieved so far. The results clearly show that there is a tremendous improvement in 2022 as compared to 2021, the gap has narrowed. The strategies being used for implementation are working. Therefore, it is recommended that the districts measure Length and height for all the children who come for Growth monitoring and promotion (GMP) sessions as they are measuring their weight which will allow facilities to track monthly performance

against the targets. It is also recommended that community-based volunteers should enhance follow up and reminders in the community on the importance of checking the length and height of children. It is further recommended that follow up of children above 1 year six months is be done in facilities that do not meet monthly targets.

45. IMPROVING VIRAL LOAD COVERAGE THROUGH SERVICE INTEGRATION AT LUBOMBO RURAL HEALTH CENTRE IN MAZABUKA DISTRICT.

Best Practices Abstract (Poster)

Lungu, D.[1], Phiri, C.[1], Funga, B.[1], Simbimbi, G.[1], Ntutuma, D.[2], Kalema, A.[2], Mwamba, S.[2], and Mwaba, P.[2]

[1] Lubombo Rural Health Centre,

[2] Mazabuka District Health Office

Introduction

Lubombo Rural Health Centre is a high volume facility located in North East of Mazabuka District, about 13 kilometres from town acessed by road and rail with the majority of the population working in informal employment. The facility has a catchment population of 10,228 according to the Central Statistical Office (CSO), 12,348 by head count and a Treatment Current (TX CURR) of 1156 as of 10th July 2022. Routine HIV Viral Load (VL) monitoring of all eligible clients on the TX CURR has been shown to result in earlier detection of treatment failure, timely regimen switches, promotion of adherence to treatment and improved survival. The VL coverage at the facility was at 88% as of October 2021 according to SMARTCARE against the target of 95% giving a performance gap of 7%. The study was set out to improve the Viral load Coverage from 88% to 95% by September 2022.

Methods

This was an interventional study conducted at the facility with the aim of improving the VL coverage. A retrospective audit and root cause analysis using the Why Tree Method where applied to come up with the service integration strategy to improve the VL coverage from 88% as of October 2021 to 95% by September 2022. This was done alongside other supporting interventions such as providing after hours VL services. VL blood sample collection was integrated with other services that bring

clients to the health facility such as Out Patient clinics (OPD), Family Planning (FP) services, antenatal (ANC) and postnatal (PNC) services. This was implemented with the aim of reducing appointment burden for due clients and maximizing on their presence within the health facility. And all ART appointments were harmonized to one date.

Results

Through a retrospective audit and root cause analysis using the Why Tree Method, the causes identified included; clients employed in sugar cane farms were unable to get off days for their VL appointments, Self- Stigma, Inadequate locator details of clients who move in and out of the catchment area especially sugar cane cutters, and long distances to the facility. VL coverage improved by 1% (88% pre-implementation to 89% intra-implementation) after the intervention, with certainty of continued improvement.

Conclusion

The investigation of problems associated with low VL coverage against target using the Why Tree Method to isolate unique causes was successful. At the beginning of the project in October 2021 strategies were implemented to rectify the gaps identified and these are still being implemented until the target is achieved. Because of high Fluctuations of VL coverage due to the expiry of the documented results close monitoring of the indicator critical. It is recommended that clients who are unable to come to the clinic due to self-stigma or illness are followed to their homes for samples collection.

46. PREVALENCE AND FACTORS ASSOCIATED WITH UNDETECTABLE VIRAL LOAD AMONG ADULT PEOPLE LIVING WITH HIV RECEIVING ANTIRETROVIRAL THERAPY AT THE UNIVERSITY TEACHING HOSPITAL IN LUSAKA, ZAMBIA: A CROSS-SECTIONAL STUDY

Scientific Abstract (Oral)

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Introduction

Zambia continues to record highly unacceptable levels of new HIV infections among adults. Therefore, UNAIDS has set a target to eliminate HIV/AIDS as a public health threat by 2030 through the use of treatment as prevention (TasP). At the foundation of this goal is what is known as Undetectable equals Untransmittble (U=U), stating people living with HIV (PLWHIV) on antiretroviral therapy (ART) for at least 6 months who achieve and maintain an undetectable viral load (<200 copies/mL) have effectively no risk of sexually transmitting the virus to their HIV-uninfected sexual partners. However, little is known about the level of viral load undetectability and factors associated with it. This study sought to determine the prevalence and factors associated with undetectable viral load among adult PLWHIV receiving ART at UTH in Lusaka, Zambia.

Methods

This was a cross-sectional analytical study conducted on 8,681 adult PLWHIV who were on ART for at least 6 months at UTH Adult Infectious Disease Center. Data on demographics, clinical and immunological parameters were extracted from the patients' SmartCare® electronic health record system. The primary outcome was the proportion of patients that achieved an undetectable viral load prior to December 31st 2021. We analyzed variables that were associated with undetectable viral load using both univariate and multivariable logistic regression. Statistical analyses were performed using STATA® version 16.1 MP. A p-value of <0.05 was considered statistically significant.

Results

Of 8,681 adult PLWHIV, 88.2% (7,660) had an undetectable viral load. Having adjusted for all the other covariates, being a patient in the age ranges 30-44 years (AOR = 1.71, 95% CI 1.41–2.08, p-value <0.001), 45-64 (AOR = 2.41, 95% CI 2.00–2.90, p-value <0.001), ≥65 years (AOR = 2.93, 95% CI 2.00–4.31, p-value <0.001) compared to the young adults (18-29 years), 3-monthly dispensing of ART (AOR = 1.47, 95% CI 1.12–21.92, p-value <0.001), or 6-monthly (AOR = 2.17, 95% CI 1.80–2.62, p-value <0.001) compared to those on a monthly dispensing of ART, and being initiated on ART at WHO clinical stage 1, stage 3 and stage 4 (AOR = 1.59, 95% CI 1.24–2.04, p-value <0.001), (AOR = 1.37, 95% CI 1.03–1.81, p-value = 0.028), and (AOR = 1.59, 95% CI 1.15–2.19, p-value = 0.005) respectively, compared to those who were initiated on ART at WHO clinical stage 2, were independently associated with higher odds of undetectable viral load. However, presenting with advanced HIV disease (AHD) (CD4 <200 cells/mm3) at ART initiation (AOR = 0.33, 95% CI 0.28–0.39, p-value <0.001) compared to those without, having had started ART after the U=U campaign was launched in Zambia (AOR = 0.25, 95% CI 0.20–0.32, p-value <0.001) compared to those who started earlier, and taking Efavirenz-based regimen (AOR = 0.44, 95% CI 0.36–0.53, p-value <0.001), or taking multi-tablet ART regimen (AOR = 0.27, 95% CI 0.22–0.32, p-value <0.001) compared to taking Dolutegravir-based regimen, were independently associated with lower odds of undetectable viral load.

Conclusion

Our study demonstrated a high level of undetectable viral load among adult PLWHIV on ART at UTH in Lusaka, Zambia. Attention should be given to groups at risk of not achieving undetectability.

47. THERAPEUTIC APPROACHES TO MALNUTRITION ENTEROPATHY (TAME): A RANDOMISED CONTROLLED TRIAL IN CHILDREN WITH SEVERE ACUTE MALNUTRITION IN ZAMBIA AND ZIMBABWE

Scientific Abstract (Oral)

Chandwe, K.[1], Bwakura-Dangarembizi, M.[2], Amadi, B.[1], Tawodzera, G.[2], Murch, S.[3], Hill, S.[4], Playford, R.[5,6], VanBuskirk, K.[1], Prendergast, A.[2,7], and Kelly, P.[7]

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Introduction

Severe Acute Malnutrition (SAM) carries high mortality when complicated by infection or metabolic derangements, which require inpatient management. As intestinal dysfunction (diarrhoea, microbial translocation, malabsorption) is a prominent feature of complicated SAM we set out to evaluate four novel interventions for intestinal dysfunction in children with complicated SAM.

Methods

Multi-arm, phase II, non-blinded randomised controlled trial in two hospitals in Lusaka, Zambia, and Harare, Zimbabwe. All children received inpatient standard care following WHO guidelines. Children were randomised to 14 days of i) oral or nasogastric bovine colostrum three times daily, ii) N-acetyl glucosamine three times daily, iii) budesonide three times daily (then tapered), iv) subcutaneous teduglutide once daily, or v) standard care only. The primary endpoint was a composite of faecal biomarkers (myeloperoxidase, neopterin and α1-antitrypsin). Secondary endpoints were biomarkers of mucosal damage, inflammation, and microbial translocation; and clinical recovery, anthropometry,

adverse events and mortality. A subgroup in Lusaka additionally underwent endoscopy for small intestinal biopsy. α for hypothesis testing was pre-specified at 0.1.

Results

Between May 2020 and April 2021, 125 children were randomised, 3 died, 3 withdrew, and 119 (95%) contributed endpoint data. The faecal biomarker score (mean at baseline 1.87) was reduced in the teduglutide group by 0.89 (95%CI -0.06, 1.85) compared with the standard care group (P=0.07 by ANCOVA). Teduglutide also led to a significant increase in crypt depth in mucosal biopsies compared to standard care (median 197µm (IQR 149,221) versus 151µm (IQR 136,162); P=0.02 across all groups). Budesonide reduced plasma C-reactive protein (CRP; mean reduction 5.2mg/L (95%CI 0.0, 10.5); P=0.05) and CD163 (mean reduction 405 ng/mL (95%CI 8,803); P=0.05) while colostrum and N-acetyl glucosamine had effects only on CRP (reductions 5.9mg/L (95%CI 0.6, 11; P=0.03) and 4.8mg/L (95%CI 0.3,10; P=0.07) respectively). Diarrhoea was reduced by 2.2 days (95%CI 0.9, 3.5: P=0.001) in the N-acetyl glucosamine group. Adverse Events were not significantly different between treatment arms.

Conclusions

All interventions were safe. Teduglutide led to significant reductions in markers of malnutrition enteropathy, and budesonide reduced systemic inflammation. Larger trials are warranted to establish clinical efficacy, optimal timing and duration of intervention during nutritional rehabilitation.

48. INTERPERSONAL THERAPY VS. ANTIDEPRESSANT MEDICATION FOR TREATMENT OF POSTPARTUM DEPRESSION AND ANXIETY AMONG WOMEN WITH HIV IN ZAMBIA: A RANDOMIZED FEASIBILITY TRIAL.

Scientific Abstract (Oral)

Spelke, B[1]., Paul, R[2]., Blette, B[3]., Meltzer-Brody, S[2]., Schiller, C[2]., Ncheka, J[2]., Kasaro, M[2]., Price, J[1]., Stringer, J[1]., and Stringer, E[1].

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Introduction

Postpartum depression (PPD) is a prevalent and debilitating disease that may affect medication adherence and thus maternal health and vertical transmission among women with HIV. The study was set out to assess the feasibility of a trial of interpersonal therapy (IPT) versus antidepressant medication (ADM) to treat PPD and/or anxiety among postpartum women with HIV in Lusaka, Zambia.

Methods

Between October 29, 2019 to September 8, 2020, we pre-screened women 6-8 weeks after delivery with the Edinburgh Postnatal Depression Scale (EPDS) and diagnosed postpartum depression or anxiety with the Mini International Neuropsychiatric Interview. Consenting participants were randomized 1:1 to up to 11 sessions of IPT or daily self-administered sertraline and followed for 24 weeks. We assessed EPDS score, Clinical Global Impression-Severity of Illness (CGI-S), and medication side effects at each visit and measured maternal HIV viral load at baseline and final study visit. Retention, visit adherence, change in EPDS, CGI-S, and log viral load were compared between groups with t-tests and Wilcoxon signed rank tests; we report mean differences, relative risks, and 95% confidence intervals. A participant satisfaction survey assessed trial acceptability.

Results

78/80 (98%) participants were retained at the final study visit. In the context of the COVID-19 pandemic, visit adherence was greater among women allocated to ADM (9.9 visits, SD 2.2) vs IPT (8.9 visits, SD 2.4; p=0.06). EPDS scores decreased from baseline to final visit overall, though mean change was greater in the IPT group (-13.8 points, SD 4.7) compared to the ADM group (-11.4 points, SD 5.5; p=0.04). Both groups showed similar changes in mean log viral load from baseline to final study visit (mean difference -0.43, 95% CI -0.32, 1.18; p=0.48). In the IPT group, viral load decreased significantly from baseline (0.9 log copies/mL, SD 1.7) to final visit (0.2 log copies/mL, SD 0.9; p=0.01).

Conclusions

This pilot study demonstrates that a trial of two forms of PPD treatment is feasible and acceptable among women with HIV in Zambia. IPT and ADM both improved measures of depression severity, however a full-scale trial is required to determine whether treatment of PPD and anxiety improves maternal-infant HIV outcomes.

49. MATERNAL TOBACCO SMOKING AND CHILDHOOD OBESITY IN SOUTH AFRICA: A COHORT STUDY

Scientific Abstract (Oral)

Nkomo, N.Y[1]., Simo-Kengne, B.D[1]., and Biyase, M[1].

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Introduction

Tobacco use and obesity are major public health problems and part of the leading causes of preventable disease and death worldwide. The prevalence of overweight children has escalated over the years; making the weight gain in children a critical issue for health professionals and academics alike. This study examines the association between maternal tobacco use and body weight abnormalities among South African children.

Methods

The study uses data from the National Income Dynamics Study (NIDS), conducted from 2008 to 2017. The survey is available in five waves which have been merged into a panel dataset of 211,718 children aged between 0 to 5 years old, drawn from a nationally representative sample of households followed across time. Thus, the subgroup of children aged between 6 and 15 years old was excluded from the analysis. The empirical investigation employs a logistic regression model to estimate the marginal effect of maternal smoking on childhood overweight prevalence measured by three anthropometric based proxies, namely risk of child overweight, child overweight and child obesity. This framework assumes unobserved child characteristics to be uncorrelated with independent variables (random effect assumption); hence allowing to control for time-invariant sociodemographic factors which are likely to affect child nutritional health.

Results

In addition to sociodemographic and health characteristics of mothers, empirical findings suggest that maternal smoking exhibits a significant odds and/ or probability of weight abnormalities in children. Notably, children of smoking mothers are likely to be obese, overweight, or at risk of becoming overweight with a possible coexistence of mother-child overweight. Similarly, weight irregularities in children are likely to increase with mothers' age. Conversely, married mothers although associated with increased odds of children having high BMI, display a reduced probability of children being abnormally weighted. Finally, child support grant has the potential to improve children's nutritional health as children whose mothers are recipients of such grants have a negative probability of having high BMI.

Conclusion

Overall, maternal smoking contributes to child overweight and/or obesity in South Africa; suggesting that maternal healthy lifestyle could be an alternative strategic tool to fight against overweight in children. However, mothers' inability to remain and/or follow a healthy lifestyle is plausible as age increases, with a spillover effect on child care. Thus, policymakers should prioritize programs to reduce smoking, especially amongst pregnant women and caregivers, to minimise the risk of overweight in children. Promoting the consumption of healthy foods accompanied by physical activity may reduce mothers' stress levels and their incentive to self-medicate using tobacco substances. In addition, comprehensive action programs including child support grants and recommendations for treatment plans that address the problems of children who are already suffering from overweight, remain essential.

50. FEATURES OF INFLAMMATORY BOWEL DISEASE IN A ZAMBIAN CITY

Scientific Abstract (Oral)

Hodges P[1], Mulenga C[2], Zyambo K[2], Sibwani J[2], Banda R[2], Kelly P[2]

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[2] *Tropical Gastroenterology and Nutrition Group, University of Zambia School of Medicine*

Introduction

Inflammatory bowel disease (IBD) is increasing in incidence in newly-industrialised countries.(1) The environmental factors driving this change are not clear, although it seems likely that changing diet and improving hygiene and sanitation are involved. There is an urgent unmet need for data on IBD in sub-Saharan Africa as available evidence suggests that incidence of IBD in this region is rising.(2,3) Environmental enteropathy (EE) is a lesion of the small bowel with villous blunting, chronic inflammation and increased gut permeability seen in people living in insanitary conditions in resource-limited settings. Given that IBD has traditionally been recorded in high-income countries and appears to emerge in line with the demographic transition, is there a socio-economic gradient between EE (which is known to be ubiquitous in low-income countries) and IBD? This study aimed to examine whether EE is present in people with IBD in Zambia by assessing small bowel biopsies and biomarkers in plasma and stool.

Methods

The research was carried out in Lusaka from October 2020-August 2022. IBD cases were recruited from the GI clinic of a tertiary hospital in Lusaka. Two groups of controls were recruited: high and low socioeconomic status (SES). All participants underwent gastroscopy and collection of duodenal biopsies and blood samples. Biopsies were assessed for morphometric markers and biomarkers of enteropathy were assessed in plasma and stool. Demographic information was collected by questionnaire. As data was non-normally distributed, continuous variables were compared using the Kruskal Wallis H test and categorical variables using Fisher's exact test.

Results

Results are available from 24 IBD cases, 44 high SES controls and 20 low SES controls. Clinical features of IBD patients are shown in Table 1. Socioeconomic factors were similar between IBD cases and high SES controls. Crypt depth and epithelial surface area were greater in biopsies from low SES controls. Plasma concentrations of sCD14 and sCD163 were not significantly different between cases and controls however lipopolysaccharide binding protein (LBP) levels, C- reactive protein (CRP) and faecal calprotectin (FCP) were higher in cases (Figure 1).

Conclusion

We show here for the first time that IBD does occur within the Zambian population and EE can coexist alongside IBD. Morphometric assessment of biopsies shows that environmental enteropathy is present even in people from higher socioeconomic groups in Zambia, however, there is a gradient of severity of enteropathy with people with IBD and high SES being at the less severe end of this spectrum. Microbial translocation seems to be a feature of IBD in Zambia as in other geographical locations.

51. IMMUNOLOGICAL RESPONSES OF BLOOD LEUKOCYTES TO BACTERIAL ANTIGENS IN CHILDREN WITH SEVERE ACUTE MALNUTRITION AT THE UNIVERSITY TEACHING HOSPITAL IN LUSAKA, ZAMBIA

Scientific Abstract (Oral)

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Introduction

Severe acute malnutrition (SAM) contributes to one million deaths per year in children under 5 years old primarily due to infections. The risk of infectious morbidity and mortality persists during and after treatment, which suggests that these children may have delayed restoration of their innate immune defences against pathogens. Hence, we aimed to characterize innate anti-bacterial immune cell function in children admitted to the University Teaching Hospital (UTH) in Lusaka, Zambia with SAM relative to healthy controls.

Methods

This study enrolled 141 children with SAM and 91 healthy-controls aged 0-60 months admitted to 3 hospitals in Zambia and Zimbabwe from the HOPE-SAM study cohort for *in-vitro* innate immune function assessment from June 2016-May 2018. Blood was collected from each child and their cells were either cultured *in-vitro* with or without fluorescently-labelled *Escherichia coli* (*E.coli*) bioparticles for

1-hour at 37°C to characterize their bacterial-binding capacity and in a separate assay without any antigen or with *E. coli* Lipopolysaccharide (LPS) or Heat killed *Salmonella typhimurium* for 24 hours at 37°C to characterize antigen-specific immune cell activation and soluble mediator secretion (Tumour necrosis factor-alpha (TNF-α), Interleukins 6 and 8 (IL-6 and IL-8), and Myeloperoxidase (MPO)). The *E. coli* binding and antigen-specific upregulation of activation markers (CD40, CD86, and HLA-DR) by monocytes and neutrophils were characterized in these cultures by flow cytometry while soluble mediators were measured using ELISA.

Results

We only report data from 16 SAM cases and 14 healthy controls enrolled at the UTH. Neutrophils and monocytes from children with SAM bound more *E.coli* than the controls. Children with SAM also had a higher upregulation of LPS and HKST-specific CD40 than the controls. However, monocytes from SAM children were unable to upregulate CD86 in the presence of LPS and HKST (i.e. CD86 upregulation in the absence of antigen > LPS>HKST), while the opposite was seen in the controls. Additionally, the upregulation of HLA-DR in the controls was higher in response to LPS and HKST than in the cases. Further, LPS and HKST-specific TNF-α, IL-6, IL-8, and MPO secretions were similar in both SAM and the controls though all HKST-specific mediators were higher in the SAM children.

Conclusion

From this data, we see that children with SAM may have altered innate immune responses as their monocytes and neutrophils bind more to *E. coli* but have lower upregulation of HLA-DR. These children are also unable to upregulate CD86 in the presence of LPS and HKST which may affect their ability to activate the adaptive immune system.

52. FEEDING BEHAVIOUR OF MALARIA VECTORS IN WESTERN ZAMBIA AND ITS IMPLICATIONS ON ATTRACTIVE TARGETED SUGAR BAITS FOR MALARIA CONTROL AND ELIMINATION

Scientific Abstract (Oral)

Chanda, J.[1], Miller, J.M.[1], Chanda, B.[1], Muyabe, R.[1], Kaniki, T.[1], Mwenya, M.[1], Ng'andu, M.[1], Sakala, J.[1], Ngulube, W.[2], Mwaanga, G.[3], Simubali, L.[3], Mainza, A.[3], Mburu, M.[3], Simulundu, E.[3], and Wagman, J.[4]

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[4] PATH Malaria Control and Elimination Partnership in Africa (MACEPA), Seattle, Washington, USA

Introduction

Indoor residual spraying (IRS) and Long-lasting insecticidal nets (LLINs) are being scaled up for malaria elimination in sub-Saharan Africa. Nonetheless, these vector control tools in are limited to achieve malaria elimination and hence outdoor strategies such as attractive targeted sugar baits (ATSBs) are required in western Zambia.

Objectives: (i) To determine whether the daily feeding rate of malaria vectors on ASB stations deployed in rural villages in Kenya and Zambia is at least 2.5%. (ii)To determine whether the daily feeding rate is significantly different (at least 5% higher) when 3 ASB stations versus 2 ASB stations

Methods

Indoor and outdoor adult mosquitoes were collected monthly from 15 randomly selected houses using UV CDC light traps in Kaoma and Nkeyema districts of western Zambia. All mosquitoes collected were morphologically identified and screened for uranine (dye) using by UV fluorescence microscope. Species of An. gambiae s.l and An. funestus group were screened by polymerase chain reaction (PCR)

Results

A total of 144,550 anophelines were collected. Overall, 21.6% (n=42,587) of An. funestus and 10.4% (n=1,940) of An. gambiae specimens were positive for uranine (dye) in the abdomen. For both species, dye positive was higher in male mosquitoes, 31.2% (n=1,638) for An. funestus and 20.6% (n=34) for

An. gambiae, than in female mosquitoes, 21.3% (n= 40,949) for An. funestus and 10.2% (n=1,906) for An. gambiae. The ranges of proportion dye-positive by cluster for An. funestus was 13.9% to 28.5% (CV = 0.19) and was 2.6% to 13.2% for An. gambiae (CV = 0.42). No difference in proportions fed was observed between clusters with 2 or 3 ASBs per eligible structure, for either An. funestus (20.2% vs. 16.4%, p = 0.156) or for An. gambiae (11.2% vs. 10.8%, p = 0.899). Based on the model, the overall feeding rate over the 12-week study period were above the 2.5% threshold for An. funestus was 8.9% (7.7% - 9.9%) to 12.7% (11.7% - 13.4%) while daily feeding rates for An. gambiae were 3.9% (3.3% - 4.7%) to 5.2% (4.4% - 6.1%).

Conclusions

This study demonstrates that anopheline populations achieved the 2.5% daily feeding rates threshold predicted to result in at least a 30% decline in malaria incidence. Feeding rates observed in this study implies the potential for ATSBs to control indoor and outdoor dwelling mosquitoes.

53. FOOD AND WATER INSECURITY AMONG CHILDREN LIVING WITH HIV IN MACHA ZAMBIA.

Scientific Abstract (Oral)

Hamangaba, F[1]., Ndubani, P[1]., Moyo, N[1]., Sauer, M[2]., Moss, W[2]., Sutcliffe, C.,[2] and Palmer, A.[2]

[1] Macha Research Trust

[2] Department of International Health Johns Hopkins Bloomberg School of Public Health

Introduction

An estimated 1.2 million people in Zambia are living with HIV, including 62,000 children. Zambia also faces the persistent threat of food insecurity triggered by rainfall shortages and crop failures. Rural populations in particular have more limited access to HIV care and treatment and, given a heavy reliance on rain-fed subsistence agriculture, experience wide fluctuations in the availability of, access to, and utilization of food and water. The goals of this study were to assess the prevalence of household food and water insecurity, examine their associations with HIV treatment adherence and outcomes, and identify coping mechanisms and entry points for intervention in a rural area.

Methods

We nested a mixed-methods study within an ongoing clinical cohort of children living with HIV (CHIV) and receiving care at Macha Hospital in Southern Province. All active participants in the cohort (n=298) were eligible. From March 2021 to February 2022, the Household Food Insecurity Access Scale (HFIAS) and Household Water InSecurity Experiences (HWISE) modules were administered to all consenting participants. HFIAS and HWISE scores were calculated and households were classified as food and/or water insecure, respectively, using standard cut-offs. We identified caregivers of CHIV (<12 years of age) and older CHIV in moderately to severely food insecure households for in-depth interviews (IDIs). IDIs were conducted in Chi-Tonga using a semi-structured guide, recorded, transcribed, and translated. The relationship between food and water insecurity scores, demographics (caregiver education and socioeconomic status), treatment adherence, laboratory measures (CD4+ T-cell count and viral load), and clinical status (underweight and stunting) were explored. Qualitative data from the IDIs were coded by two independent coders and analyzed using Atlas.ti.

Results

186 participants (median age: 13 years; 50% female; 14% stunted; 17% underweight) completed the HFIAS and HWISE modules. Based on HFIAS and HWISE scores, 72% of participants lived in households with moderate (25%) or severe (47%) food insecurity and 2% in households with water insecurity. The proportion of participants living in moderately or severely food insecure households was higher if caregivers had completed at most primary school (79%) compared to secondary school or higher (62%; p=0.01) and if the household had the lowest socioeconomic scores (80% compared to 59% for higher scores; p=0.02). No other characteristics or outcomes were associated with moderate or severe food insecurity. Analysis of the IDIs is ongoing and will be completed in September 2022.

Conclusions

We found a high prevalence of food insecurity in households with CHIV in Southern Province. While food and water insecurity are closely linked, few households were experiencing water insecurity. It is likely that this condition varies by season and year. This research adds to the literature on food insecurity and HIV, here with a focus on CHIV in a rural area with both limitations in access to care and agricultural practices prone to food and water system shocks.

54. IMPACT OF NOCTURNAL RELATIVE HUMIDITY AND TEMPERATURE ON HOT-DRY SEASON MALARIA IN CHOMA DISTRICT, SOUTHERN PROVINCE, ZAMBIA

Scientific Abstract (Oral)

Lubinda, M[1]., Matoba, J[1]., Sing'anga, C[1]., Simubali, L[1]., Mudenda, T[1]., and Shiff, C[2].

[1] *Macha Research Trust,*

[2] *John's Hopkins University.*

Introduction

Zambia is amongst the sub-Saharan African countries to have experienced an increase in malaria from 3,083,000 in 2015 to 3,149,000 in 2016, and with deaths persisting at approximately 2000 annually. The Ministry of Health set a goal of eliminating malaria by 2021, with Southern Province categorised as a pre-elimination setting. Despite many interventions such as indoor residual spraying (IRS), malaria persists throughout the year, from a prevalence of about 15% during the wet season, December – June, to that of about 1% during the dry season, July – November. What drives the hot-dry season malaria when mosquito densities are depleted, and with low malaria parasite loads in the population is not well understood. It was hypothesised that the climatic factors; nocturnal relative humidity (RH) and temperature were critical in sustaining low level dry season malaria transmission.

Objectives: This study sought to assess the impact of nocturnal (18:00 – 06:00) RH and temperature, and a 3-hour threshold of nocturnal RH of at least 50% on malaria incidence during the hot-dry season, August – November, in Choma District, between 2017 and 2019.

Methods

Ten households with different malaria transmission levels and elevation were selected from nine sampled sites at which weather loggers were hanged on trees and granaries to record fine scale RH and temperature every hour. Malaria data was sourced from the nearest rural health centres (RHCs), and using RHC catchment headcount population, calculated malaria incidence per 100,000. Data was analysed in R version 4.1.2 Statistical Computing Environment using the negative binomial regression model.

Results

There was no significant impact of mean RH (p value = 0.123), mean temperature (p value = 0.162), and the 3-hour thresholds of RH of at least 50% (p = 0.428) on weekly hot-dry season malaria incidence in Choma District, between 2017 and 2019. The addition of December data alone to the hot dry season analysis produced significant results for both RH and temperature (p value <0.0001).

Conclusion

The study revealed no evidence to support the hypothesis that nocturnal RH and temperature had an impact on hot-dry season malaria incidence in Choma District. However, it was interesting to note that the inclusion of the December data alone to the analysis revealed a significant impact of nocturnal RH and temperature on malaria in Choma District. This is important as it shows the existence of a potent reservoir of malaria parasites during the hot-dry season which is critical in driving the wet season expansion just after the onset of the rainy season when mosquito populations resurged. Rolling out entomological interventions such as mass IRS and larvae habitat characterisation just before the onset of rains has potential to prevent wet season malaria outbreaks.

55. EFFECT OF HAEMODIALYSIS ON ARTERIAL STIFFNESS IN CHRONIC KIDNEY DISEASE PATIENTS

Scientific Abstract (Oral)

Mwenya, G.[1]

[1]*The University of Zambia, School of Medicine. Department of Physiology*

Introduction

CKD Patients have increased arterial stiffness, which starts early and is associated with CKD progression into end-stage renal disease. Arterial stiffness represents the mechanical properties of arterial blood vessels' resistance to deformation when the heart ejects blood into the aorta during systole. Interestingly, the literature presents contradicting findings on the relative effect of haemodialysis on arterial stiffness. To date, very few studies have been conducted in sub-Saharan Africa.

Aim: To explore the effects of haemodialysis on arterial stiffness in chronic kidney disease patients at UTH Renal unity, Lusaka, Zambia.

Methods

This was a cross-sectional observational study of chronic kidney disease patients. Participants were selected using a simple random sampling method and a structured questionnaire to obtain socio/demographic data. Height was measured to the nearest 0.1cm using the Seca Brand 214 Portable Stadiometer (Secagmbh& Co. kg Humburg, German). Weight was measured to the nearest 0.1kg using the Heine Portable Professional automatic Adult Scale 737. Blood pressure was measured using the automatic OMRON HEM 705 CP machine. The Complior® program (Complior II; Colson, Garges Les Genesse, France) measured PWV and AIX from Carotid to femoral (cfPWV) and also to radial (crPWV) arteries using non-invasive piezoelectric transducers. The pre-dialysis measurements were taken 10 minutes before and post dialysis measurements 15 minutes after haemodialysis in patients routinely undergoing the procedure at UTH Renal Unit. Results are expressed as means±SD or median and ranges for skewed data. Categorical variables were analysed using counts and percentages.

Results

Seventeen (17) chronic kidney disease patients on haemodialysis therapy participated in the study. The age range was between 22 to 49 years with a median of 43 years; eight were females representing 47.1%, and nine males, 52.9%. Reduced arterial stiffness was observed between pre and post dialysis for Carotid to femoral pulse wave velocity (cfPWV; 9.9±3.1vs.7.5±3.2 m/s, p=0.0004) and Carotid to femoral augmentation index (cfAix; 18.8±43.5vs.10.9±31.5%; p=0.049) both significantly reduced in 76.47% of the respondents. Carotid to radial pulse wave velocity (crPWV; 11.2±3.4vs.11.9±2.8 m/s,p=0.513) and carotid to radial augmentation index (crAix; 9.4±23.2vs.20.4±21.7%; p=0.161) insignificantly reduced in 52.9%.

Conclusion

In this study, results showed significantly reduced cfPWV and cfAix, which significantly correlated with renal damage and deterioration, as reported. Therefore, haemodialysis positively affects arterial stiffness and is beneficial to CKD patients because it retard CKD progression into end-stage renal disease based on these results. However, the consistency of these results requires validation using

longitudinal studies, a larger sample size and consideration of many endothelial factors that affect the vascular function not considered in this study.

56. PREVALENCE OF HEPATITIS B AND SYPHILIS AMONG JUVENILES IN 13 PRISONS AND ADULTS FROM ONE LARGE CORRECTIONAL FACILITY IN ZAMBIA

Scientific Abstract (Oral)

Singini, D[1]., Kagujje, M[1]., Hatwiinda, S[1]., Moonga, C[1]., Somwe, P[1]., Thornicroft, M[1]., Zgambo, T[1]., and Muyoyeta, M[1].

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Introduction

Incarcerated persons World over, have disproportionately higher prevalence of *hepatitis B* and other sexually transmitted infections (STIs) compared to the general population. Globally, it is estimated that the prevalence of *hepatitis B* infection among incarcerated persons is 5.17%, with a higher prevalence among males compared to females. In the Zambian general population, the prevalence of *hepatitis B* in the age group 0-59 is 3.5%, whereas active syphilis in the age group 15-59 was 3.0%. There is no data on the prevalence of *hepatitis B* or STIs among incarcerated persons in Zambian correctional centres/prisons.

Method

A cross-sectional-survey was done to determine the prevalence of *hepatitis B* and Syphilis among juveniles in conflict with the law detained in 13 prison/correctional facilities, and adults incarcerated at the largest correctional centre in Zambia, between 2018 and 2019. The *hepatitis B* surface antigen test was used for *hepatitis B* testing and the rapid antibody syphilis test was done. This study was conducted as part of the Elton John Juvenile Offenders Health Project to determine the baseline burden of hepatitis and other STIs against which to measure achievement post implementation.

Results

A total of 462 juveniles in conflict with the law were screened, of this number, 395 were tested for *hepatitis B* and 256 were tested for syphilis. The median age for juvenile offenders was 17 (IQR 16-18) and the prevalence of *Hepatitis B* and syphilis was 4.3% 95 CI (2.5-6.8) and 3.1% (1.3-6.1) respectively. 1747 incarcerated adults were screened and had a median age 35 (IQR 28-44), of this number, 1310 were tested for Hep B and all adults were tested for syphilis. Among incarcerated adults, the prevalence of Hep B and syphilis was 4.8% (3.7-6.1) and 1.4% (0.9-2.0) respectively. The prevalence of both *hepatitis B* and syphilis was significantly higher among HIV positive juvenile offenders than among HIV negative juvenile offenders.

Conclusion

Incarcerated persons in a large correctional centre in Zambia had high rates of *hepatitis B* and syphilis. Similarly, the HIV and TB prevalence is higher in this population compared to the general population. This study presents the first evidence of the high burden of hep B and STIs among incarcerated persons in Zambia. Incarcerated populations represent a high-risk group with a compendium of risk factors pre and post incarceration. Interventions such as pre-entry screening, and exit screening should be considered for these populations.

57. HEALTH CARE WORKERS' REACTIONS TO THE NEWLY INTRODUCED HEPATITIS B VACCINE IN KALULUSHI, ZAMBIA: EXPLAINED USING THE 5A TAXONOMY

Scientific Abstract (Poster)

Nyasa, M.[1], Chipungu, J. [1], Ngandu, M. [1], Chilambe, C. [1], Nyirenda, H. [1], Musukuma, K. [2], Lundamo, M. [1], Simuyandi, M. [1,2], Chilengi, R. [1,2], and Sharma, A. [1]

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[2] Enteric Disease and Vaccine Research Department, Centre for Infectious Disease Research in Zambia (CIDRZ), Lusaka, Zambia

Introduction

Hepatitis B virus (HBV) is highly infectious and deadly disease that is transmitted through blood and body fluids. Health care workers (HCWs) have a high risk of contracting HBV in health care settings, the HBV vaccine one of the recommended prevention intervention/tools. However, uptake of the vaccine among HCWs remains low in Sub-Saharan Africa. We aimed to explore the barriers and facilitators to uptake of the vaccine offered free of charge to HCWs and nursing students in Kalulushi district, Copperbelt Province of Zambia

Methods

A total of 29 in-depth interviews (IDIs), either in person or via telephone, with participants before and after they received the vaccines were used to collect the data. The data collection took place in Kalulushi district on the Copperbelt between January 2020 and October 2020. We analysed the barriers and facilitators to full or partial vaccination using Penchasky and Thomas's (1981) 5As (Access, Affordability, Awareness, Acceptance and Activation) taxonomy framework for vaccine hesitancy.

Results

All participants had access to the vaccine, and it was free of charge, making it affordable. Regarding awareness, all participants were aware of HBV infection as an occupational hazard, however, HCWs felt that more sensitization would be needed to increase awareness and knowledge of the vaccine. Acceptability of the vaccine was high among all completers and some non-completers as they felt it was safe and offered them protection. One non-completer felt coerced to accept the first dose due to supervisor expectations and would have preferred to have been given more time to decide. Most felt that vaccination should be compulsory for HCWs. Lastly, activation (vaccine uptake) among non-completers was hindered by late or no notification of appointments as the main reason for not completing the full vaccination schedule. HCWs advised that for countrywide roll-out, at least one weeks' notification would be necessary for HCWs to plan and be mentally prepared to be at their workstations when the vaccination is taking place.

Conclusions

The need to offer the vaccine free of charge locally to ensure easy access and affordability is essential to increase vaccine uptake. Vaccination policies and guidelines for health workers, ongoing training

and knowledge sharing are required. Involving trained champions in the facility can also help encourage HCWs to get vaccinated.

58. THE SOCIAL AND ENVIRONMENTAL DETERMINANTS UNDERLYING HIV- SAM: A RAPID APPRAISAL TO UNDERSTAND THE CONTEXTS IN WHICH CHILD CONVALESCENCE OCCURS (HIV-SAM)

Best Practices Abstract (Poster)

Miyoba, C.[1]

[1] *TROPGAN*

Introduction

One third of children hospitalized with SAM in sub-Saharan Africa are HIV-positive • Malnutrition remains one of the most frequent manifestations of advanced HIV – these two conditions need to be managed concurrently. • One-third of children hospitalized with severe acute malnutrition (SAM) in sub Saharan Africa have HIV infection (HIV-SAM co-morbidity). • And these children have 3-fold higher mortality, more morbidity, slower nutritional recovery and a greater risk of relapse compared to children with SAM alone despite ART. • What causes this post-discharge mortality? Based on Clinical and verbal autopsy data: Pneumonia, Diarrhea and Malaria • Multiple pathogen exposure in these childrens environments contribute to recurrence of disease that eventually leads to readmission and death. Therefore, the overall aim of this rapid appraisal is to define the social and environmental determinants underlying HIV-SAM through in-depth qualitative research to understand the contexts in which child convalescence occurs, to identify psychosocial pathways for intervention. The study set out to characterize the home environment and gain a deeper understanding of the social and environmental context in which child convalescence occurs in order to identify the most effective and sustainable methods for addressing the psychosocial determinants of multimorbidity. Understand child and caregiver mobility through mapping of primary carer's caregiver networks. To explore the specificities arising from co-morbidities – HIV-SAM and 'ideal' space of/for intervention. To explore the nature, incidence and types of health seeking consultations related to HIVSAM and decision-making processes around taking a child to hospital. • To explore understandings of stigma and shame around caring for a child with HIV and SAM in the community and the role of health workers in

creating and reinforcing shaming narratives or practices. Identify opportunities for psychosocial interventions in complex caring environments characterised by multiple social and environmental determinants of multimorbidity.

Methods

This rapid appraisal adopted a mixed methods research design of Quantitative survey, focus group discussions (FGDs), Semi-structured in-depth interviews (IDIs), Observations, Focus group discussions and in-depth interviews were done using set of semi-structured guides

Results

Interviews Conducted

Survery-48

FGD'S -A total of 7 were conducted. (2 with health care workers, 1 with grandmothers, 1 with pastors, 1 with fathers, 1 with traditional healers and 1 with caregivers)

The results obtained from all the interviews are as follows: Levels of stigma in the community are still high for children with both malnutrition and HIV. Caregiver support is usually dependent on the relationship the mother has with the person. However, they get the most support from Grandmothers, trusted neighbors, sisters, in-laws etc. Caregivers have mixed health seeking behaviors i.e some will go to faith healers, others to the hospital, others use herbal concoctions and others mix. Children with a co-morbidity of HIV-SAM are more difficult to look after. Most caregivers only seek medical help when the child is very sick.

Conclusion

Of all interventions, we believe the grandmothers have the most influence in the wellbeing of the child in terms of care at home and health seeking behaviors of the primary caregiver. The grandmothers must be equipped with knowledge in terms of training on how to care for these children in the community for any impact to be seen.

59. INTEGRATION OF SRH/HIV AND SGBV SERVICE DELIVERY: BEST PRACTICES AND LESSONS LEARNT IN THE IMPLEMENTATION OF THE 2GETHER 4SRHR PROGRAMME

Best Practices Abstract (Oral)

Chama-Chiliba, M.C.,[1] Manengu, J.,[2] and Lungu, A. E[3]

[1] University of Zambia,

[2] UNFPA,

[3] UNICEF

Introduction

The integration of SRHR, HIV and SGBV service delivery is key to improving quality, efficient use of resources and providing comprehensive client-centred care. The 2gether for 4SRHR project supports the Government of Zambia to institutionalise the integrated approach to providing SRHR, HIV and SGBV services. This study documents the best practices and lessons that emerge from three areas during the implementation of the 2gether 4SRHR programme : 1) mentorship models to improve the quality of integrated SRH/HIV and SGBV services; 2) Strengthening data generation and use through real time data visualization and advocacy for age and sex disaggregated data model; and 3) Use of community based volunteers model in the provision of integrated SRH information and services.

Methods

The study uses a qualitative multi-method design, including literature and document review and 26 in-depth interviews with community workers, health workers including government officials and beneficiaries in Central and Western provinces, to unpack the best practices and lessons learnt in the implementation of service integration in the pilot health facilities in Central and Western provinces. Data for key integrated service indicators for the period 2018 to 2021 were extracted from health management information system administrative database for the intervention and comparison health facilities.

Results

Service integration facilitated the increased provision of SRH/HIV and SGBV services, thus improving efficiency in service delivery for clients and health care providers. The capacity building for health care providers embedded in the programme for health care providers increased the staff with skills to provide clients with comprehensive integrated services. Effective localised mentorship programmes facilitated the increase in the number of health care providers able to deliver integrated services, thus contributing to increased service provision to clients. Whereas the training and effective orientation of health care providers is key to integrated service delivery, the role of trained leadership in ensuring acceptance of programme, corrective supervision and motivation of staff is critical to ensuring continuity and sustainability. Training community-based volunteers in integrated service delivery helped reduce the staff workload at health facilities and improved data capturing. Knowledge gaps in understanding the idea of integration and few trained staff were the main challenges faced at programme inception. The lack of equipment, including registers, testing kits, supplies and commodities and inadequate space at health facilities affect the delivery of integrated services.

Conclusion

Concerted efforts to scale up and mainstream SRHR/HIV and SGBV services are needed. Strategies to overcome barriers to effective service integration delivery need to be developed. Setting up localised mentorship programmes, to ensure the effective transfer of knowledge, ensuring that the trained leadership at facilities motivate health care providers to deliver integrated services and are able to provide corrective supervision, the availability of registers, medical supplies and commodities necessary for the delivery of integrated services are critical factors in implementing integrated service delivery.

60. EFFECTS OF TRADITIONAL FERMENTED FOODS CONSUMPTION ON GUT MICROBIAL COMPOSITION IN 6-24 MONTHS OLD CHILDREN IN RURAL ZAMBIA

Scientific Abstract (Oral)

Chileshe, J.[1], Marinda, P.A.[2], Hamaimbo, B.T.[2], Sikalima, J.[1], Handema, R.[1], Zwaan, B.J.[2], Talsma, E.F.[3] and Schoustra, S.E.[2,3]

[1] *Tropical Diseases Research Centre*

[2] *University of Zambia*

[3] *Wageningen University*

Introduction

The human microbiota consists of a complex community of microorganisms that play an important role in immunity, nutrition and metabolism, and structure and function of the gastro intestinal tract. Diet is one of the important factors that affect the gut microbiota, with fermented foods generally known to be beneficial in modulating the gut microbiota. In Zambia many traditional fermented foods exist that are important in the diets of various groups. The aim of this study was to determine the impact of consuming traditional fermented foods Mabisi and Munkoyo on the gut microbiota and their metabolism in children.

Methods

Data on food consumption, morbidity and socio-demographic together with stool samples were collected from children aged 6-24 months residing in Namwala and Mkushi in Zambia from February to March 2018. The stool samples were analysed for the Microbial composition using ABI Fast 7500 Real-Time PCR and concentrations of short chain fatty acids (SCFAs) as a proxy for microbial metabolism using SHIMADZU HPLC machine. SPSS (version 25) for statistical analysis was used for data analysis. A non-parametric ANOVA was performed to test for effect of fermented foods consumption on different bacterial types and SCFAs. Further, we performed multivariate General Linear Regression (GLS) and used Pillai's Trace as a test for significance with combined dependent variable firstly comprising of Bacteroides, Lactobacillus, Bifidobacteria and Enterococcus abundance

and secondly comprising of SCFAs. Ethical approval was obtained from the TDRC ethics review committee.

Results

A total of 126 stool samples were collected from the enrolled children, 58 in Namwala district and 68 in Mkushi district. Gut microbiota of children who are fermented beverages consumers was associated with higher relative abundance of Bacteroides ($F(3)=2.928$, $P=0.038$) and Lactobacillus ($F(3)=4.259$, $P=0.007$) than the non-consumers. Higher levels of these bacterial groups have been associated with benefits to the host. There was no difference for the SCFA concentrations between the fermented foods consumers and non-consumers, which may be because other parts of the diets that we did not control also contribute to SCFA production.

Conclusion

The results have shown that consumption of the two traditional fermented foods (Munkoyo and Mabisi) promotes a healthier gut microbiota composition the Zambian children. However, to support and confirm our promising results, it is recommended that randomised controlled human feeding trials be conducted to determine the impact of traditional fermented beverages consumption on gut bacteria modulation as well as the possible interaction between human gut system and fermented beverages.

61. IMPACT OF VIRAL LOAD COVERAGE ON 6 MULTI-MONTHS DISPENSING IN HIGH VOLUMES IN ACTION HIV SITES IN MUCHINGA, NORTHERN AND LUAPULA PROVINCES

Best Practices Abstract (Oral)

Chibanda, I.,[1] Pimpa, S.,[1] Mwango, A.,[1] Chirwa, B.,[1] Wose, K.C.,[1] and Chasela, C.[1]

[1] USAID Action HIV

Introduction

Viral suppression, Retention and adherence to care remain critical to attaining the targets for HIV epidemic control (EC). Differentiated ART delivery services using 6 multi and dispensing (MMD) and

fast-tracked drug pick-ups in the facilities and community collection points and decongesting high-volume sites improves retention of clients and improved viral suppression. We assessed viral coverage, suppression, and retention among patients on 6 month-month scripting over period of year.

Methods

Patient flow at facility was optimised to screen and VL (Viral Load) sample collected of all ROC (Recipients of Care), ROC files were screened for eligibility for 6MMD, and those meeting the eligibility criteria, offered medication through fast-tracked within in the health facility. Monthly reports from Q1 and Q4 were used to track the progress of Viral load and 6MMD coverage during the period under review.

Results

The evaluation was done on 34 facilities with a TxCurr above 1000 Recipients of Care (ROCs) in Muchinga, Luapula and Northern provinces between Q1FY 22 to Q4 FY22. 67,255 clients were assessed for 6 MMD, those eligible and given 6 MMD were 43, 164. Viral Load coverage increased from Q1FY 22 to Q4FY 22 from 73% to 80% respectively. 6MMD recipients from 68% in Q1 to 80% in Q4. Suppression rate was maintained at 96 % during the period under review.

Program data showed that several patients ART continue to miss their scheduled clinic appointments and disengaged from routine clinic care. This was due to long waiting times at facilities, seasonal migrant labour, and long distances travelled to facilities.

Conclusion

Viral load coverage and suppression are key to implementation of Differentiated Model of ART Delivery -6MMD, improved client retention and decongest health facilities. 6MMD is key to improving retention and adherence to treatment in facilities. However, interventions should be implemented to increase viral load coverage so that all virally suppressed clients are dispensed with 6MMD.

62. CONFIDENCE AND TRUST IN THE HEALTH SYSTEM AND HEALTH INSURANCE ENROLLMENT AMONG THE INFORMAL SECTOR POPULATION IN LUSAKA, ZAMBIA HEALTH INU

Scientific Abstract (Oral)

Chibumbya, R[1]., Kaumba, P.C[1]., Bwalya, J[1]., Kagujje, M[1]., and Muyoyeta, M[1].

[1] CIDRZ,

Introduction

To improve equitable access to quality essential services and reduce financial hardship, low-and-middle-income countries are increasingly relying on prepayment strategies such as health insurance. Among the informal sector population, confidence in the health system to provide effective treatment and trust in institutions can play an important role in health insurance enrollment. The objective of this study was to examine the extent to which confidence and trust affect enrollment into the recently introduced Zambia National Health Insurance Scheme. Our main hypothesis is that having low confidence in the health system will decrease the odds of enrolling in the national health insurance. We made a distinction between the public and private health sector as the time of the study, the majority of accredited providers were in the public health sector with a few private health providers accredited to serve enrollees.

Methods

We conducted a regionally representative cross-sectional household survey from November 6 to December 19 2020 in Lusaka, Zambia collecting information on demographics, health expenditure, ratings of last health facility visit, health insurance status and confidence in the health system, trust and perceived performance of the government. We used multivariable logistic regression to assess the association between enrollment and confidence in the private and public health sector as well as the government in general.

Results

Of the 620 respondents interviewed, 70% were enrolled or planning to enroll in the health insurance. Only about one-fifth of respondents were very confident that they would receive effective care in the public health sector 'if they became sick tomorrow' even though majority's last health facility visit was to a public health facility. Nearly half (48%) of respondents were very confident in the private health

sector. While confidence in the public system was only weakly associated with enrollment, confidence in the private health sector was strongly associated with enrollment (Adjusted odds ratio (AOR) 3.40 95% CI 1.73 to 6.68). No association was found between enrollment, and trust in government as well as perceived government performance. Respondents who had over 1000 Kwacha as their largest health expenditure in the past year had 2.30 times higher odds (95% CI 1.02 to 5.21) of enrollment in all the models. In addition, those in the richer quintile were 2.08 times higher odds (95% CI 1.07 to 4.11) of enrolling compared to the poorest quintile.

Conclusions

Our results suggest that confidence in the health system, particularly in the private health sector, is strongly associated with health insurance enrollment. Focusing on achieving high quality of care across all levels of the health system may be an effective strategy to increase enrollment in health insurance.

TRADITIONAL, COMPLEMENTARY, AND ALTERNATIVE MEDICINES AND THE CONTROL OF PANDEMICS: VACCINE DEPLOYMENT IN PUBLIC HEALTH EMERGENCIES

63. THE IMPACT OF QUALITY OF SPUTUM ON THE TB CASE DETECTION

Best Practices Abstract (Oral)

Chibumbya R[1]., Kaumba P.C[1]., Bwalya J[1]., Kagujje M[1]., and Muyoyeta M[1].

[1] Centre for Infectious Disease Research in Zambia

Introduction

The WHO considers early TB case detection and timely treatment initiation as one of the key strategies to control TB infections. To have a better yield, a good quality specimen is required. The purpose of this study was to review the association between sputum quality and yield.

Methods

We analyzed the data retrospectively to assess the impact of quality of sputum on the yield of the specimens. PLWHIV were enrolled in the study and TB samples collected for Xpert testing. The transportation and testing of samples was done within 24hrs. The laboratory staff at the testing site received and recorded the sputum appearance data. The data for analysis was extracted directly from the GeneXpert as CSV. Data was analyzed using STATA software 17 and tests applied including like hood ratios calculated.

Results

A total of 987 samples were analyzed. Of those, 3(0.3%) were Bloody specimens, 909 (92.1%) Mucopurulent and 75 (7.6%) Salivary. Of the 3 bloody samples, 3 (100%) were negative and 0 were positive. Of the 909 Mucopurulent samples, 805(88.5%) were negative and 104(11.5%) were positive. Of the 75 Salivary samples, 66 (88%) were negative and 9(12%) were positive. In terms of volume, 132 (13.37%) were <2 mls, 766 (77.61%) 2-5mls while 89 (9.02%) were >5 mls. Out of the 132 with <2 mls, 13 (9.84%) were positive of the 766 (2-5mls) 89 (11.61%) were positive and of the 89 (>5mls) 11 (12.35%) were positive. The P-value for the association between appearance and test result was 0.835 whereas the one for volume was 0.8021.

Conclusion

There was no difference in the yield among the different sputum samples. With the difficulties associated with sputum collection, this finding should help various TB programs to consider revising

algorithms relating to specimen quality requirements to prevent unnecessary sample rejections. Hence delaying diagnosis.

64. THE EFFECT OF SECURIDACA LONGEPENDUCULATA (VIOLET TREE) ROOT-BARK EXTRACT ON THE SEMEN QUALITY OF GUINEA PIGS.

Scientific Abstract (Poster)

Singwa, M., Mwale, N. K., Babu, S., and Mwaanga, E.S.

Introduction

Infertility is considered a major problem in both men and women. Treatment of infertility in men can range from medication therapy to the manipulation of the sperms outside the body. Due to these treatments being expensive, many people have opted to seek alternative herbal medicine to solve the problem. The main objective was to investigate the effect of Securidaca longepedunculata root-bark extract on the semen quality of guinea pigs.

Methods

The root-bark of Securidaca longepedunculata from Mpongwe were extracted, identified and quantified for phytochemicals using phytochemical screening and gas chromatography-mass spectrometry respectively. 20 guinea pigs were randomly allocated to five groups A, B, C, D, and E which were treated with 10 mg/kg distilled water (negative control), 0.6 mg/kg clomiphene citrate (positive control), 50 mg/kg, 75 mg/kg, and 100 mg/kg of S. longepedunculata root-bark extract respectively. The means of their semen quality (sperm motility, sperm concentration, and sperm viability) and hormonal profile results were then analyzed using SPSS and compared at P-value less than 0.05 at 95% CI.

Results

Phytochemical screening showed that the extract had 8 phytochemicals (saponins, flavonoids, alkaloids, terpenoids, steroids, cardiac glycosides, and phenols) in different concentrations. Gas chromatography-mass spectrometry results revealed that the extract contained 10 components with varying masses and retention times. The extract also had about 12.5 ug/ml of zinc. The means of LH before treatment had no significant difference between treatment groups at $P<0.05$. But after

treatment, a significant difference was observed between treatment groups at P<0.05. On the other hand, no significant difference in the means of Follicle Stimulating Hormone before and after treatment groups at P<0.05 was observed. The means of progressive motility, non-progressive motility, gross motility, sperm concentration, and sperm viability between treatment groups were significantly different at P<0.05, but no significant difference was observed in the means of immotility between treatment groups at P<0.05.

Conclusion

The findings from this study revealed that treatment of root-bark extract of S. longepedunculata at 75 mg/kg for 34 days increased the levels of LH, sperm motility, sperm concentration, and sperm viability. The effects seen at this concentration were similar to the conventional clomiphene citrate thereby potentially providing an alternative option for treatment of infertility caused by sperm motility, concentration and viability.

65. IMPACT OF HIGH DOSE VITAMIN D3 SUPPLEMENTATION ON INNATE IMMUNITY AND ANTIMICROBIAL FUNCTIONS IN ADOLESCENTS WITH HIV-1 ON ART

Scientific Abstract (Poster)

Sichibalo, K.[1,2], Leschczyk, C.[1], Kelly, P.M.[2,3], Rowland-Jones, S.[4], and Schaible, U.E. for VITALITY team[1]

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[4] Nuffield Department. of Clinical Medicine, University of Oxford, UK

Introduction

Despite the advent of antiretroviral therapy (ART), efforts to effectively reduce HIV-related inflammation and comorbidities beyond use of ART remain a challenge. Consequently, new host directed therapies to improve antimicrobial immunity without causing immunopathology are needed. In vitro experiments demonstrated an impact of 1,25(OH2) D3 (vit. D3) on innate immunity by

polarization of monocytes, induction of autophagy and killing of intracellular bacteria, such as Mycobacterium tuberculosis (M.tb.). However, most clinical studies showed only a health benefitting impact in vit. D3 deficiencies and Vit.D receptor (VDR) polymorphisms.

In VITALITY, an ongoing placebo-controlled phase 3 clinical trial, HIV-1 infected adolescents on ART in Zambia and Zimbabwe are receiving weekly high dose vit. D3 (20,000IU) and daily calcium carbonate (500mg) supplementation to assess, whether bone development and immunity will improve. In our sub-study, we will analyse the effect of vit. D3 supplementation on neutrophil and monocyte activation and polarization, antimicrobial killing and modulation of chemo/cytokine production.

Methods

We will infect fresh blood samples from the VITALITY cohort with M. bovis Bacille Calmette-Guérin (BCG) as a model pathogen. A comprehensive cellular phenotyping by flow cytometry will reveal bacterial infection rates, expression of Fc Receptors (CD16, CD64), markers for neutrophil activation (CD62L, CD11b, CD66b, CD15), monocytes (CD14, HLA-DR, PDL-1), macrophage polarization (CD200R, CD163, CD80, CD86) and autophagy (LL37, LC3B). Direct detection of neutrophil associated effectors, such as lipocalin2, matrix metalloproteinases and modulators, myeloperoxidase, S100 alarmins, interleukin 8 and antimicrobial peptides will be correlated with the capacity for intracellular killing as assessed by performing colony forming unit analysis. Isolated vit. D3 polarized monocytes will also be further differentiated into M1/M2 like macrophage (GMCSF + IFNγ / MCSF + IL-4) and infected with Mtb. to assess phagocytosis rates, intracellular killing, and induction of necrotic cell death by Cytation 1. Finally, we will compare outcome of the clinical study with results from in vitro vit. D3 treatment of whole blood and monocyte samples from healthy donors to establish an improved in vitro model.

Conclusion

Results from this study will help to ascertain the potential role of vit. D3 supplementation as immunomodulatory adjuvant complementing ART to improve antimicrobial responses, immune recovery and patient care in the HIV-1 context.

66. A SEMI-FIELD SYSTEM FOR QUANTITATIVE TRACKING OF ANOPHELES GAMBIAE OLFACTORY PREFERENCES

Scientific Abstract (Oral)

Giraldo, D[1]., Tauxe, G.M[1]., Rankin-Turner, S[1]., Gao, A.L[1]., Jackson, D.M[1]., Simubali, L[2]., Book, C[1,2]., Stevenson, J.C[1,2]., Thuma, P.E[1,2]., Mburu, M.M[2]., Simulundu, E[2] and McMeniman, C.J[1,3]

[1] *W. Harry Feinstone Department of Molecular Microbiology and Immunology*

[2] *Macha Research Trust, Choma, Zambia*

Introduction

Sin reducing the prevalence of malaria, innovative vector control tools are still needed to combat this disease of profound public health significance, particularly in sub-Saharan Africa. The African malaria mosquito Anopheles gambiae is a highly anthropophilic mosquito species that preferentially seeks humans on which to blood feed. To detect humans, female An. gambiae track a complex blend of airborne chemicals emitted in human body odor from the skin and breath that differs between individual humans. Variability in the chemical composition of human odor signatures has the potential to modulate mosquito attraction to certain humans, with important implications for malaria transmission.

Methods

Towards identifying chemical features that underlie inter-individual differences in human attractiveness to An. gambiae, we have developed a large scale, semi-field system at Macha Research Trust, Choma District, Zambia for the quantitative tracking of mosquito olfactory preferences. This system consists of a large screened semi-field cage (20m x 20m x 2.5m) for contained assays of An. gambiae olfactory preferences that is flanked at its perimeter by eight one-person tents. Each tent is connected to the central cage by aluminum ducting to directionally pipe odor via a low-speed fan from any target olfactory cue placed inside the tent, including whole body odor from sleeping humans, into the flight cage arena. To quantify mosquito attraction to different olfactory stimuli, we have engineered a novel behavioral assay customized for scoring landing behavior of An. gambiae during night-time hours, without the requirement for mains power, termed the odor-guided thermotaxis assay (OGTA). The OGTA uses infrared videography to quantify landings of female An. gambiae on an aluminum platform heated to human skin temperature that can be baited with target odorants such as carbon

dioxide (CO2) or whole human body odor emanating from screened ducting from each tent. Eight OGTAs are positioned equidistantly in a central circular array within the flight cage for multichoice assays of mosquito olfactory preference.

Results

Using replicate night-time assays and high-information content tracking algorithms with an increasing complexity of olfactory stimuli, we have validated in multi-choice preference trials that female An. gambiae consistently prefer OGTAs baited with CO2 over background air, human body odor over CO2 and the scent of one individual over another. To validate this system with larger numbers of humans, we have performed replicate multi-choice OGTAs with body odor from 6 humans and are currently applying computational analysis methods using neural networks to automate scoring of mosquito landings to boost experimental throughput.

Conclusion

These data indicate that this multi-choice olfactory assay has potential to accurately quantify An. gambiae olfactory preferences and form the basis of an innovative resource for large-scale screens to identify humans that are highly attractive or unattractive to An. gambiae. We plan to leverage this system for downstream studies to define the chemosensory basis of malaria transmission and develop human-derived mosquito attractants for vector control.

67. SEROLOGICAL PREVALENCE CHANGES IN RURAL SOUTHERN ZAMBIA FROM 2009 TO 2018

Scientific Abstract (Oral)

Katowa, B.[1], Hamapumbu, H.[1], Thuma, P.E.[1], Bérubé, S., Wesolowski, A.[2], Moss, W.J.[2] and Kobayashi, T.[2]

[1] Macha Research Trust, [2]Johns Hopkins Bloomberg School of Public Health

Introduction

Disease surveillance has become a core tool in the fight against malaria. With the malaria transmission declining, getting accurate malaria case numbers to measure the incidence and prevalence of malaria

is becoming more challenging. Serological surveillance may offer an alternative method to document malaria transmission especially in low transmission settings.

Methods

Households were randomly selected from a satellite image and participants were enrolled into a serial cross-sectional study within the Macha Hospital catchment area between 2009 to 2012 and 2018. A dried blood spot collected on Whatman 903 Protein Saver paper was soaked in 5% skim milk-PBST for one hour and the eluted sample was used in an enzyme immunoassay (EIA) to detect immunoglobulin G (IgG) antibodies against whole parasite *P. falciparum* asexual blood stages measured at 405 nm and expressed as the optical density (OD).

Results

Seropositivity was calculated and annual seroconversion rates (SCRs), an estimate of the force of infection, was calculated using a reversible catalytic model. The SCR decreased sharply by about two thirds from a level of approximately 0.15 year^{-1} in 2009 and 2010 to approximately 0.05 year^{-1} in 2011 and 2012 and decreased five-fold to 0.01 year^{-1} by 2018, demonstrating the utility of serology in this pre-elimination setting. Participants younger than 10 years were observed to have reduced exposure the malaria parasite.

Conclusion

Serial cross-sectional serosurveys can provide a better measure of changing malaria transmission intensity in pre-elimination settings than cross-sectional parasite prevalence estimates that require large samples sizes for precision. This study shows the power of serological surveys which could be used as a transmission monitoring tools especially in low transmission settings or as an outbreak indicator while cases are still sporadic.

68. NONTUBERCULOUS MYCOBACTERIUM IN LUSAKA, ZAMBIA, A CASE SERIES

Scientific Abstract (Poster)

Shuma B.,[1] Muzazu S.G.,[1] Sanjase N.,[1] Mateyo K.,[2] Muyoyeta M.[1]

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[2] University Teaching Hospital

Introduction

Nontuberculous mycobacteria (NTMs) aka MOTT is defined as mycobacteria other than tuberculosis or leprosy. These ubiquitous organisms have capacity to cause both pulmonary and extra-pulmonary disease especially in the immunocompromised. However, the in-country burden of this hard-to-treat disease remains unclear with no national guidelines on diagnosis and treatment. The Zambian prevalence is estimated to be twice that of PTB at about 15.1% among presumptive TB cases. This study aimed to describe the burden of NTMs in a high TB burden population. Secondarily we sought to describe the NTM diagnostic challenges and propose a management approach adaptation.

Methods

The study is being conducted at Chawama General Hospital nested under the Google AI study whose purpose is to investigate the value of Google's TB algorithm, normal vs. abnormal, COVID-19 algorithm, for use as a triaging test amongst presumptive TB patients to reduce the total cost of diagnosis and increase patient throughput. At enrolment, a digital chest Xray, clinical history and physical examination are done. Additionally, sputum samples are collected from participants for microscopy, TB Gene Xpert and culture. Patients diagnosed as PTB based on CXR or clinical symptoms/signs, are referred to the chest clinic to commence anti-tuberculous therapy (ATT). Upon receipt of culture results, if NTM positive, participants are called for clinical symptoms and signs re-evaluation and repeat sputum culture samples collection. Those with persisting symptoms are referred to UTH pulmonologist for further management.

Results

As the main study is ongoing, we present preliminary findings in form of a case series. The prevalence of NTM among 1169 presumptive TB cases was 1.7%, with 27 NTM positive cultures identified and 12 speciated. Repeat sputum culture specimens were collected from 12 participants of which, 4 yielded negative NTM,1 positive, and 7 still pending. The bulk of our participants were female (78%), young (18-34 years) and had no co-morbidities (78%). Isolated species included *M.szulgai/intermedium* (4), *M.intracellulare* (2), *M.gordonae* (1), and *M.fortuitum* (5). 25 participants presented with respiratory symptoms, 6 commenced on ATT based on CXR and clinical findings at baseline visit and ATT was discontinued on 4 participants to initiate NTM treatment. Two participants had initial positive cultures for *M.tuberculosis* but month 1 and 2 follow-up results were positive for NTM. ATT was continued in these due to clinical improvement.

Conclusion

These preliminary results show that NTMs are prevalent in Zambia and they may be responsible for some poor responses to PTB treatment or recurrent CXR diagnosis post ATT. Our study highlights the challenges faced in making a diagnosis of NTM which include long turnaround time for results, high rate of lab contaminants, need for speciation and need for a repeat culture prior to making a diagnosis. Other challenges include delays in initiating appropriate treatment due to the organism-specific regimens that require speciation results aforehand. NTMs are a neglected and emerging public health concern that requires that the guidelines for diagnosis and treatment be contextualised to our region. Better and faster diagnostic tests are required. There is also need to streamline the drug stocking for this rarely occurring but serious disease.

69. FACTORS AFFECTING HIV TREATMENT RETENTION IN THE WESTERN PROVINCE OF ZAMBIA: A CASE OF LEWANIKA GENERAL HOSPITAL

Scientific Abstract (Poster)

Liswaniso, L.[1]

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Introduction

The purpose of this study was to examine factors affecting HIV treatment retention in the western province of Zambia. Accelerated achievement of HIV epidemic control cannot be realized without optimized retention of patients on ART, this because if ARV drugs are not consistently and correctly taken, HIV viral multiplication occurs which leads to increased HIV related morbidity and mortality. Therefore, adequate knowledge and evidence are needed to be examined, documented and best practices replicated to ensure ART adherence. The study was guided by the following objectives: To identify key factors affecting HIV treatment retention in Western Province; to examine the level of significance of the association between the factor and adherence to HIV treatment, and to make recommendations that will inform Ministry of health and other institutions of interest.

Methods

A non-experimental design was used in this study in which quantitative data collection methods. A total of 77 sampled HIV patients from Lewanika General Hospital were randomly selected and interviewed using the survey questionnaire.

Results

The study established that clinical condition (such as time since HIV diagnosis, period of antiretroviral therapy, change of ART medication, and experience of illness in the past 30 days), disclosure of HIV status, forgetfulness, being busy and knowledge about HIV are among the common factors affecting HIV treatment retention.

Conclusion

In addition, the study revealed that clinical stage (such as time since HIV diagnosis, period of antiretroviral therapy, change of ART medication, and experience of illness in the past 30 days) was significantly associated with adherence to antiretroviral therapy. The results also showed that psychosocial factors such as active drug or alcohol abuse, social support, beliefs about HIV and its treatment were significantly associated with adherence to antiretroviral therapy.

70. PERCEPTION OF COMMUNITY MEMBERS TOWARDS THE QUALITY OF COVID-19 AWARENESS, PREVENTION AND INFORMATION: A QUALITATIVE APPROACH

Scientific Abstract (Poster)

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Introduction

How to ensure that quality of information being provided to communities pertaining to the awareness, prevention and treatment of COVID 19 has been of growing concern. While several studies have focused on the perceptions of information service providers and administrators, there has been a lack of research conducted on community's perceptions toward the COVID-19 information reaching them especially in the rural areas of Zambia. This study examines the community members and their perceptions towards the COVID-19 information they received. The study was aimed at assessing the impact of the COVID-19 awareness information that was passed to communities with focus on the prevention and treatment seeking behavior.

Methods

This study utilizes qualitative methods to investigate the perceptions of community members from Ngwezi Settlement Farming Block A in Magoye-Southern Province regarding the quality of COVID 19 Information based on their own pandemic experiences. In-depth Interviews will be conducted with key informants (Chief, headmen/women, educators and the clergy) in the community and Focus

Group Discussions with the 4 different groupings (Children, Adolescents, adults and the aged) in the community as will be informed by the key informant's interviews data sets. Thematic analysis will be used to analyze data where Transcripts made of audiotaped interviews will be checked for accuracy against the original recordings and extensive coding of the interview will be conducted by researchers.

Results

The results of this study are not yet collected. We anticipate to highlight the knowledge and perception of the community on COVID- 19 as a disease, availability, accessibility to, usage, impact of and limitations in the provision of awareness, prevention and treatment information for the disease we further want to provide and suggest potential solutions to clear the myths, misconceptions and adverse experiences with regards to COVID-19 information provision.

Conclusions

We anticipate that by understanding of the community knowledge and perceptions regarding COVID 19 Information provision, It is hoped that the findings of the research will be used by policy makers to develop policies that guide the provision of information, information providers to provide appropriate and pertinent information in appropriate packages and languages and the community members to consume/ use information appropriately to control and mange pandemics within their communities and ultimately improve the provision and use of information and practices therein. The insights will provide guidance on how to develop appropriate health education, communication and promotion strategies and information packages in the control of pandemic diseases without Mis and Dis-Information

71. ACCEPTANCE OF COVID-19 VACCINATIONS AND BOOSTERS AMONG INDIVIDUALS VISITING SELECTED HEALTH FACILITIES IN LUSAKA PROVINCE: A CROSS SECTIONAL STUDY

Best Practices Abstract (Poster)

Gardner, N.P[1]., Tambatamba, B[1]., Mwale, C.[1], and Nkonde, J.[2]

[1] *Lusaka Provincial Health Office*

[2] *Chongwe District Hospital*

Introduction

Despite the presidential directive to vaccinate (2, 000,000) Zambians by December 2021, of which Lusaka Province was mandated to vaccinate about (1,545,891) people and achieve at least 70% by June 2022. The province had only managed to vaccinate about 364,919 individuals representing a 23.6% achievement by February, 2022. Different types of vaccines are available but the uptake remains low across districts in Lusaka. The province has been being an epicenter for Covid-19 from the time Zambia started recording Covid cases. However, there has been no sufficient data to support the speculations of the low vaccination uptake in selected Health Facilities of Lusaka Province. It was against this background that this study investigated the acceptance of Covid-19 vaccinations and boosters among individuals in selected Health Facilities of Lusaka Province.

Methods

Results from this study have revealed that enhance Community knowledge and understanding on the importance of Covid-19 vaccination and boosters among community members is vital in the improvement of Covid vaccination coverage in Lusaka Province.

Results

In Lusaka province findings from this study have revealed that a focus on Covid-19 vaccinations in Primary, Secondary and Tertiary institutions has a higher chance of yielding more results as compared to other settings. A need for enhanced knowledge among unmarried (single) individuals. The study has revealed information on side effects of Covid-19 is scanty hence the need to strengthen lobby for support to scale up similar studies in districts.

72. COVID-19 VACCINE HESITANCY AMONG CAREGIVERS ATTENDING A MASS MEASLES-RUBELLA VACCINATION CAMPAIGN: FINDINGS FROM A DESCRIPTIVE CROSS-SECTIONAL SERO-SURVEY NESTED IN CHILD HEALTH WEEK IN NDOLA AND CHOMA DISTRICTS OF ZAMBIA.

Scientific Abstract (Oral)

Kapungu, K.[3], Carcelen, A.C.[1], Prosperi, C.[1], Mutembo, S. [1,2], Chongwe, G.[3], Mwansa, F.D.[4], Ndubani, P.[2], Simulundu, E.[2], Bwalya, I.[3], Musukwa, G.[2], Thuma, P.[2], Hamahuwa, M.[2], Mutale, I.[3], Winter, A.[1], Truelove, S.A.[1,5], and Moss, W.J. [1,5,6]

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[6]W Harry Feinstone Department of Molecular Microbiology and Immunology, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA

Introduction

The Zambian government through the Ministry of Health (MoH) launched the COVID-19 vaccination programme at the University Teaching Hospital in Lusaka in 2021, and rapidly scaled up to primary health care level in all the 10 provinces of Zambia. Four vaccines namely Pfizer/BioNTech, Janssen (Johnson & Johnson), Oxford/ AstraZeneca and Sinopharm (Beijing) were approved for use in the country. Despite the wide availability of the Covid-19 vaccines the uptake of the vaccine has been low. Apart from health system challenges little is known about societal perceptions on Covid-19 vaccines especially among populations that are not hesitant to get other routine vaccines. We explored perceptions of COVID-19 pandemic and potential vaccine acceptance and hesitancy among caregivers that brought children for a Mass Measles-Rubella (MR) Vaccination Campaign.

Methods

A descriptive cross-sectional sero-survey was nested in the MR vaccination campaign embedded in Child Health Week of 23rd-29th November 2020, in Choma and Ndola Districts of Zambia. At this time the Ministry of Health was still planning the role out of the COVID-19 vaccines. A standardised questionnaire in the REDCap application was used to collect demographic data and vaccination history from adult caregivers who brought their children to the health facility. Semi-structured interview guides were used to interview study team staff and vaccination team staff. Chi-square analyses were conducted to examine the relationship between vaccine safety, efficacy and perceptions of threat and severity. In addition, binomial regression models were used to examine the relationship between intent to vaccinate and the perception about COVID-19 pandemic and/or vaccine. Thematic analysis, using a priori constructs derived from the Health Belief Model was used to analyse qualitative data.

Results

From 23–29 November 2020, we enrolled parents of 2,400 children who were brought to the measles and rubella mass vaccination sites in Ndola (predominantly urban) and Choma (predominantly rural). Overall, 92% of the caregivers reported that they intended to have their child vaccinated against COVID-19, but only 66% reported planning to receive the vaccine themselves. Caregivers' hesitancy to receive a vaccine was observed at most facilities in Choma, with 5 of the 15 health facilities having less than 5% of the caregivers intending to be vaccinated while in Ndola, only one of 15 facilities had high vaccine hesitancy. Perceptions about vaccine safety and efficacy were key predictors of vaccine acceptance.

Conclusion

Health education, provided by formal health providers about vaccine safety and efficacy are needed to address COVID-19 vaccine hesitancy among eligible population. Health promotion messages focused on the disease, effectiveness and benefits of the vaccine for COVID-19 pandemic are also needed at community level to increase awareness of, the risk of COVID-19 or vaccine.

73. THE IMPACT OF EARLY HIV ANTIRETROVIRAL TREATMENT INITIATION ON MEASLES IMMUNITY AMONG CHILDREN LIVING WITH HIV IN RURAL ZAMBIA

Scientific Abstract (Poster)

Matakala, K. H[1], Muleka. M[1]., Munachoonga, P., Hamahuwa, M[1]., Hamangaba, F., Moyo, N.[1], Finney, A.G.[2], Moss, W.J.[2], and Sutcliffe.G.C.[2]

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[2]Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA

Introduction

Measles is an important vaccine preventable disease that continues to cause outbreaks in Africa. Children living with HIV can respond poorly to the measles vaccine and have rapidly waning immunity. While combination antiretroviral therapy (cART) leads to successful immune reconstitution, immunity to measles is not restored without revaccination, potentially leaving untreated children living with HIV susceptible to measles. In recent years, increased access to early infant diagnosis and adoption of a test-and-treat strategy have led to children initiating cART at younger ages and increasingly prior to measles vaccination at 9 months of age. The impact of this change in the relative timing of measles vaccination and cART on short and long-term immunity to measles is not fully understood. This study was conducted to: 1) compare measles seroprevalence between children living with HIV and initiating cART before and after the first dose of measles-containing vaccine (MCV1); 2) compare measles seroprevalence between children living with HIV and age-matched HIV-uninfected children; and 3) compare trends in measles IgG antibody levels up to 4 years after cART initiation between children living with HIV and initiating cART before and after primary measles vaccination.

Methods

Plasma or dried blood spot samples were obtained from two studies in Macha, Southern Province, Zambia: 1) PART study: a longitudinal cohort study of children living with HIV and receiving care at

the Macha Hospital HIV clinic between 2007 and 2018; and 2) Malaria study: a community-based study of malaria in the catchment area of Macha Hospital conducted from 2008 to 2018.

For the first aim, samples were selected from PART study participants younger than 5 years at cART initiation and after 6-12 months of cART. The proportion seropositive will be compared by age at cART initiation: 0-9 months, 10-23 months, and 24-59 months of age. For the second aim, samples from age-matched HIV-uninfected children in the malaria study were selected for comparison. Within each age group, the proportion seropositive will be compared by HIV infection status. For the third aim, all samples up to 4 years post-cART initiation were selected from PART study participants younger than 5 years at cART initiation. Changes in measles IgG antibody levels over time will be compared between age groups.

Samples will be tested at the Macha Research Trust Clinical Research Laboratory using the Euroimmun measles IgG enzyme immunoassay.

Results

For the first aim, 292 samples from children living with HIV were selected for testing, including 81, 154, and 57 children initiating cART at 0-9, 10-23, and 24-59 months of age, respectively. For the second aim, 876 samples from age-matched HIV-uninfected children were selected. For the third aim, 1818 samples up to 4 years after cART initiation were selected from 335 children living with HIV. Sample testing is underway and will be complete in August 2022.

Conclusion

The results from this study will contribute to our understanding of the impact of early cART initiation on measles immunity and will inform measles vaccination policies for children living with HIV.

74. USING GEOSPATIAL MODELS TO MAP ZERO-DOSE CHILDREN: FACTORS ASSOCIATED WITH ZERO-DOSE VACCINATION STATUS BEFORE AND AFTER A MASS MEASLES AND RUBELLA VACCINATION CAMPAIGN IN SOUTHERN PROVINCE, ZAMBIA

Scientific Abstract (Oral)

Arambepola, R.[1], Yang, Y.[2], Hutchinson, K.[3], Mwansa, F.D.[4], Doherty, J.A.[3], Bwalya, F.[3], Ndubani, P.[5], Musukwa, G.[6], Moss, W.J.[1,2], Wesolowski, A.[1], and Mutembo, S.[2]

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Introduction

Despite gains in global coverage of childhood vaccines, many children remain under vaccinated. Mass vaccination campaigns are commonly conducted to reach these children, but their effectiveness is unclear. We evaluated the effectiveness of a mass vaccination campaign in reaching zero-dose children.

Methods

We conducted a prospective study in 10 health center catchment areas in Southern province, Zambia in November 2020. About 2 months before a national mass measles and rubella vaccination campaign conducted by the Ministry of Health, we used aerial satellite maps to identify structures. These structures were visited, and diphtheria-tetanus-pertussis (DTP) and measles zero-dose children were identified (children who had not received any DTP or measles-containing vaccines, respectively). After the campaign, households where measles zero-dose children were previously identified were targeted for mop up vaccination and to assess if these children were vaccinated during the campaign. A Bayesian geospatial model was used to identify factors associated with zero-dose status and measles

zero-dose children being reached during the campaign. We also produced fine-scale zero-dose prevalence maps and identified optimal locations for additional vaccination sites.

Results

Before the vaccination campaign, 4% of children under 9 months were DTP zero-dose and 17% of children 9-60 months were measles zero-dose. Of the 461 measles zero-dose children identified before the vaccination campaign, 338 (73.3%) were vaccinated during the campaign and 118 (25.6%) were reached by a targeted mop-up activity. The presence of other children in the household, younger age, greater travel time to health facilities, and living between health facility catchment areas were associated with zero-dose status. Mapping zero-dose prevalence revealed substantial heterogeneity within and between catchment areas. Several potential locations were identified for additional vaccination sites.

Conclusion

Fine-scale variation in zero-dose prevalence and the impact of accessibility to healthcare facilities on vaccination coverage were identified. Geospatial modeling can aid targeted vaccination activities.

75. IMPACT OF MEASLES AND RUBELLA SUPPLEMENTAL IMMUNIZATION ACTIVITIES IN REACHING MISSED COMMUNITIES DURING THE COVID-19 PANDEMIC

Scientific Abstract (Oral)

Mutembo, S.[1], Yang, Y.[1], Kostandova, N.[1], Mwansa, F.D.[2], Nakazwe, C.[3], Namukoko, H.[3], Sakala, C.[2], Bobo, P.[2], Masumba, P.[4], and Moss, W.[1]

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Introduction

Measles-Rubella (MR) Supplemental immunization activities (SIAs) aim to provide MR vaccine to children who may have missed their routine doses and give a second opportunity to children who may have failed to develop an immune response to the initial dose. However, SIAs may vaccinate the same children and not reach those who missed their routine doses. Data from Post Coverage Evaluation Surveys (PCES) assessing SIA coverage can inform program managers on the effectiveness of the MR SIA in: 1) reaching eligible children who have never received a single dose of the MR vaccine (zero-dose children); 2) reaching those eligible for a second dose but having only received one dose (under vaccinated children). We estimate the proportion of zero dose and under vaccinated reached by the 2020 MR campaign and assess factors associated with being missed by the MR campaign.

Methods

Children between 9 months - 5 years were enrolled in a cross-sectional multi-stage stratified cluster national survey conducted between October 6-12th, 2021 following the November 2020 MR SIA when Covid-19 pandemic was at its peak in Zambia. Demographic characteristics and vaccination history data were collected. Vaccination was determined by recall and under 5 card/any record of vaccination. We calculated vaccination coverage of the SIA and proportion of zero dose and under vaccinated children reached by the campaign. Prevalence ratio (PR) were calculated using a log binomial model to assess risk factors for missing the campaign.

Results

A total of 4,046 children were enrolled in the PCES. Of these, 69.3% (95% CI: 66.7%, 70.6%) were vaccinated during the SIA (MR SIA coverage for 2016 was 95%). Based on both recall and card verification, 3.3% (95% CI: 2.8%, 3.9%) received their 1st dose, and 62.1% (95% CI: 60.6%, 63.7%) received their 2nd dose or additional dose of MR vaccine during the SIA. Only 1.3% (95% CI: 1.0%, 1.8%) and 2.4% (95% CI: 1.8%, 3.1%) children had card verified receipt of 1st and 2nd dose through the SIA respectively despite the card retention being 63% (95% CI: 58%, 69.2%). Zero dose prevalence reduced from 9.4% (95% CI: 8.6%, 10.4%) to 7.4% (95% CI: 6.6% to 8.3%). In the multivariate analysis after controlling for maternal education, distance to health center and card availability zero-dose and under vaccinated children were less likely to receive the campaign dose

(PR:0.14; 95% CI 0.07, 0.29 and PR: 0.73; 95% CI 0.61, 0.86, respectively). Increased travel time to health facility was associated with decrease in the likelihood of children receiving the campaign dose.

Conclusions

The 2020 MR SIA was much lower than the 2016 MR SIA, most likely because of the impact of the Covid-19 pandemic. The SIA minimally reduced the proportion of zero dose children and zero dose children who, together with under vaccinated children, form missed communities. missed communities were less likely to be vaccinated as compared to fully vaccinated children. This implies that the SIA minimally reached the missed communities. We recommend identification of missed communities and make them a target for heightened public health interventions especially during campaigns.

76. ISOLATION AND IDENTIFICATION OF ORAL POLIOVIRUS VACCINE STRAIN AND DEMONSTRATION OF VACCINE VIRUS SHEDDING AMONG VACCINATED CHILDREN IN ZAMBIA

Scientific Abstract (Oral)

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Introduction

Poliomyelitis, a disease caused by Wild Polio Viruses (WPVs) results in life-long lameness and has no cure. WHO recommended vaccination with Oral Polio Vaccine (OPV) to eradicate this disease. A higher percentage of children will seroconvert and shed poliovirus in their stool 4 weeks post-vaccination. Poor seroconversion of OPV by children in low-income countries has been noted and could result from several factors. Isolation of the Sabin strain from healthy vaccinated children indicates effective protection from fecal-oral infection. Unlike the Zambian scenario, several studies

have documented the isolation of the vaccine virus at high rates in healthy and sick children that previously received OPV vaccination.

Methods

This was a cross-sectional study that utilized retrospective data from the reference laboratory archives. The study used closed-ended questionnaires administered by research assistants as well as stools collected from participants. The stool was from children below 10 months at two health facilities in Lusaka. Repository data from the laboratory archives was used from several districts, from children under five years. The stools were analyzed using cell culture and PCR at the UTH virology laboratory.

Results

A total of 384 stool samples fulfilled the inclusion criteria. Children that shed the Sabin strain were 7.8% with 11.7% having excreted Non-Polio Enteroviruses (NPENTs). Lusaka Province had 4.9% Sabin isolation, while Northern Region and North-Western province had 1.5% and 1.3% respectively. Children that received more than 2 doses of OPV demonstrated higher isolation, with PV3 being isolated. The Sabin strains PV1, PV1/3, and PV3 were only identified in the youngest age group at rates of 2.2%, 1.1%, and 19.1% respectively.

Conclusion

Sabin strain was identifiable in stools 4 weeks post-vaccination. Children that do not receive frequent vaccination may be at risk of infection if vaccination campaigns are not scaled up. Sabin 3 demonstrated better performance compared to Sabin 1. There is a possibility of waning immunity over time, in children that are vaccinated with OPV. NPENTs may serve risks of poor oral vaccine performance, thereby risking the re-introduction of polioviruses post the polio endgame. It may be of use to further the diagnosis of AFP cases that are categorized as non-polio compatible.

77. CONTRACEPTIVE UTILISATION AMONG AT-RISK WOMEN THAT ARE PROSPECTIVE PARTICIPANTS IN HIV VACCINE TRIALS IN ZAMBIA

Scientific Abstract (Oral)

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Introduction

Reliable contraceptive use among women participating in HIV prevention trials is an important eligibility criterion. Measuring the utilisation of contraceptives among at-risk women for HIV who are potential HIV prevention trial participants could provide essential data for recruitment into HIV prevention trials. We assessed the prevalence and factors associated with contraceptive among Zambian women at high risk for HIV who were potential candidates for an HIV vaccine trial.

Methods

We recruited 1112 women at high-risk for HIV infection who were participating in an HIV incidence cohort in Lusaka and Ndola, Zambia. The cohort included HIV-negative single mothers (recruited from infant vaccination clinics) and female sex workers (recruited from known sex work hotspots), both of whom are high-risk groups for HIV infection. Participants were asked if they used any of the following modern contraceptives (yes/no): oral contraceptives, injectables and long-acting reversible contraceptives. We employed multivariable logistic regression with adjusted odds ratios (aOR) to compute the factors associated with contraceptive use.

Results

The average age of participants was 23 (IQR 20-26) years. Most participants (71%) were using a contraceptive method. Participants were around twice as likely to use contraceptive methods if they identified as sex workers (aOR=1.92; P=0.01) compared to participants who did not identify as sex workers; were aged between 20 to 24 years (aOR=2.01, P=0.01) versus those aged less than 20 years; and if they were sexually active with the father of their last child (aOR=2.04; P<0.001) versus no longer sexually active with the father of their last child. Lastly, women who reported multiple sexual partners in the previous year were more likely to use contraception than women who reported less than two sexual partners in the previous year (aOR= 2.69; p=0.01)

Conclusion

At-risk women that are potential participants in HIV prevention trials have high modern contraceptive use. During recruitment, future HIV prevention trials should consider age, occupation, number of sexual partners and sexual activity with the fathers of the women's children to ensure that the inclusion criterion of being on a reliable contraceptive method is met.

78. HUMAN PAPILLOMAVIRUS VACCINE ACCEPTABILITY AND ITS ASSOCIATED FACTORS AMONG MOTHERS OF FEMALE CHILDREN 9-14 YEARS IN NDOLA DISTRICT OF ZAMBIA.

Best Practices Abstract (Oral)

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Introduction

Human papillomavirus (HPV) is one of the most common sexually transmitted infections globally and is a risk factor for cervical cancers. Cervical cancer is a severe disease of the cervix, leading to death if not timely and effectively treated. Zambia has the second-highest incidence of HPV in sub-

Saharan Africa (53.7/100,000 women) second only to Tanzania and sixth highest incidence rate in the whole world. Despite the high rates of cervical cancer, at least two vaccines are available that can protect women from cancer-linked to HPV types 16 and18. However, prophylactic HPV vaccines target young adolescent's and are now available in Zambia. As a result, parental approval is frequently required for adolescent vaccination. Research focusing on the importance of parents appreciating knowledge and understanding of the HPV vaccine is crucial. There is currently a paucity of information on HPV vaccine and acceptability of HPV vaccine among mothers of adolescent girls. It may have implications on the success of the HPV vaccination program if not explored. , hence, the proposed study to estimate HPV acceptability among mothers of female children 9-14 years old and its associated factors.

Methods

This was a cross-sectional survey in selected townships of Ndola District in Zambia in Kabushi, Chifubu, Kaloko and Lubuto. 350 mothers of female children aged 9-14years old were sampled and allocated per study site using simple random sampling of mothers proportionate to adolescents. Data was collected using semi-structured questionnaires. SPSS was used to analyze the data. The outcome variable was HPV vaccine acceptability. Factors associated with HPV vaccine acceptability were examined using bivariate logistic regression, and associations were established using adjusted odds ratios with 95% confidence intervals.

Results

Total of 350 parents or guardians were approached, and ten questionnaires were excluded due to either inconsistent or incomplete responses to the questionnaire indicating a 97% response rate. HPV vaccine acceptability was 61.8%. The study showed that occupational status, alcohol consumption and knowledge on HPV as factors associated with HPV vaccine acceptability. Mothers who knew HPV vaccine were 2.41 times [(AOR2.41 (95%CI: 1.63, 3.62)] more likely to accept the vaccine for their daughters than mothers who had no knowledge. Similarly, mothers employed were 1.47 times [(Adjusted Odds Ratio 1.47(95% CI: 1.02, 2.13)] more likely to accept the Vaccine for their daughters than unemployed mothers. Mothers who never smoked had a 1% chance of vaccinating their daughters compared to mothers who smoked.

Conclusion

The overall HPV vaccine acceptance among mothers of female children aged 9-14 years in Ndola district was low compared to WHO recommendation of 80% coverage. Hence, the need to develop various interventional programs targeted towards alcohol consumption, occupational status and knowledge of HPV vaccine among mothers of female children aged 9-14 years. These interventions should aim at increasing HPV vaccine acceptability.

79. PREVALENCE OF COVID-19 VACCINE ACCEPTANCE AND ITS ASSOCIATED FACTORS IN ZAMBIA

Scientific Abstract (Poster)

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Introduction

Coronavirus Disease 2019 (COVID-19) was declared a pandemic by the World Health Organization (WHO) in March 2020 after it spread rapidly across the globe bringing appreciable socioeconomic disruption alongside increased morbidity and mortality. Because of the impact of COVID-19 on global health, there have been investments by pharmaceutical companies, governments and funding agencies worldwide in accelerated research and development of vaccines as a viable and future preventive measure. Uncertainty about the public acceptance of COVID-19 vaccination is still an important challenge and vaccine hesitancy is one of the top ten threats to global health and this is exacerbated by the emerging conspiracies surrounding COVID-19 and its vaccine .The study was aimed at determining the prevalence of COVID-19 vaccine acceptance and its associated factors in Zambia. Specifically, the focus was to assess the prevalence of COVID-19 in the sample, determine the

proportion of the sample that has been vaccinated and explore reasons affecting the acceptance of the COVID-19 vaccine.

Methods

The study was done between February – June ,2022 and adopted a cross-sectional design using a mixed mode approach where online, telephone and/or face to face approaches were used in a single study. Study Population were Zambian citizens and adults aged 18 years and above and consented to take part in the study.2187 participants were selected using convenience and snowball non-probability sampling methods. Data was collected using a questionnaire which was administered using online, telephone and face-to-face methods. Statistical Package for Social Sciences version 23 (IBM Corporation) was used for analysis of the data. Test of associations were undertaken using Pearson chi-square test or Fisher's exact test as appropriate.

Results

From the 2187 participants, 64.9% participated through online,25.3% using telephone and 9.7% through face-to-face across the 10 provinces of Zambia. The prevalence of COVID-19 testing was 78.5% while prevalence of COVID-19 in the sample that tested was 33% .The prevalence of COVID-19 was higher based on the symptoms,58.4% and self-isolation,56.6% .Vaccine hesitancy was found in 38.8% and was attributed to lack of information about the vaccine (36.8%) vaccine safety concerns (14.5%),crowding at vaccination facilities (13.3%),vaccine development being rushed (5%),uncertainty about the effectiveness of the vaccine (4.3%) and not willing to be forced to take the vaccine (3.2%).Vaccine acceptance was associated with gender ($p = 0.007$),age ($p = 0.001$),marital status ($p = 0.002$),education level ($p <0.000$) and occupation ($p <0.000$).

Conclusion

The prevalence of COVID-19 testing was high, an indication that people could be aware of the symptoms and effects of COVID-19. However, they were very few people from the sample that were vaccinated against COVID-19 despite the high prevalence testing. Therefore, there is a need for proper community awareness programs on the safety, effectiveness and efficacy of vaccination against COVID-19 in Zambia, in order to increase the vaccine acceptance/uptake among citizens.

THE ROLE OF IMPLEMENTATION SCIENCE IN PUBLIC HEALTH EMERGENCIES

80. FEASIBILITY OF ESTABLISHING A SEROSURVEILLANCE SYSTEM USING RESIDUAL BLOOD SPECIMENS FROM HEALTH FACILITIE

Best Practices Abstract (Oral)

Matakala, K.H.[1], Chilumba, I.[2], Winter, A.K.[3], Musukwa, G.[1], Hamahuwa, M.[1], Mutale, I.[2], Prosperi, C.[4], Kostandova, N.[4], Simulundu, E.[1], Madzire, A.[5], Nafukwe, S.[5], Nkoma, S.[6], Kabalo, M.[6], Syamungulu, C.[7], Luwaya, E.[7], Moyo, R.[7], Mwansa, T.C.[7], Situtu, K.[2], Mufwambi, W.[2], Betha, E.[2], Munachoonga, P.[1], Hasan, A.Z.[4], Carcelen, A.C.[4], Chongwe, G.[2], Mwansa, J.[5], Ndubani, P.[1], Moss, W.J.[4], and Mutembo, S.[4]

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Introduction

Targeting interventions to prevent outbreaks requires understanding of population immunity gaps. While household serosurveys are effective at providing a direct measure of seroprevalence, they are expensive and logistically challenging. Leveraging alternative ways to obtain serological data while reducing sampling bias is especially important in light of emerging and re-emerging infectious diseases, such as measles and SARS-CoV-2. To assess the feasibility of establishing a high quality and sustainable serosurveillance system in Zambia we carried out demonstration of the strategy in two districts.

Methods

A pilot serosurveillance site was established in Arthur Davison Children's Hospital (ADCH) and Ndola Teaching Hospital (NTH) in Ndola and Choma General Hospital (CGH) in Choma. Residual

blood specimens from the hematology laboratories were collected from September 2021 to July 2022 from children between the ages of 1-4 and 5-14 years at ADCH and CGH while adult residual specimens were collected at NTH and CGH. Exhaustive sampling (CGH, children's specimens) or systematic sampling (ADCH, NTH, and adult specimens in CGH) were used to select residual specimens. Specimens that were severely hemolyzed, low volume, from antiretroviral treatment clinics, and duplicates were excluded. For each specimen, facility staff extracted key demographic data and visit information. For children, history of measles-containing vaccine receipt also was collected. Specimens will be tested for IgG antibodies to SARS-CoV-2 (all specimens), measles virus (pediatric only), and tetanus toxoid (pediatric only). We present lessons learned for setting up a health facility-based serosurvey site as part of larger serosurveillance system.

Results

Across the three facilities, a total of 1118, 1234, and 529 samples were collected in the 1-4 year old, 5-14 year old, and 15 years and older age groups, respectively. Serological results are not presented here as testing is ongoing and they are outside of the scope of assessing the feasibility of the system. Residual sampling processes were largely implemented in parallel with routine laboratory activities, with personnel dedicating 1 – 3 hours per day to identify and process specimens. Specimen identification and checking for duplicates were especially time-consuming. Abstraction of variables not readily available in the laboratory was supported by a data team. In facilities where digital patient file management were not available, teams searched for information in ward registers and patient files.

Conclusion

Use of residual specimens from health facilities is a promising approach to assessing district-level immunity gaps for a variety of pathogens. Demonstration projects in three facilities showed that, while time- and labor-intensive, this approach is feasible and does not negatively impact routine laboratory activities. However, large-scale implementation requires simplifying and integrating procedures within routine laboratory activities to ensure sustainability. Data abstraction should be limited to variables available in laboratory request forms; digital solutions available in facilities should be used to streamline and expedite specimen identification processes; and we should ensure health facility ownership under the lead of Ministry of Health. With these changes, use of residual specimens at health facilities provides a promising alternative that can inform targeted response to outbreaks of measles, SARS-CoV-2, and other infectious diseases.

81. CHARACTERIZATION OF PATIENTS WITH MULTIPLE SEXUALLY TRANSMITTED INFECTIONS

Scientific Abstract (Oral)

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Introduction

Sexually transmitted infections (STIs) are among the most common cause of illness in the world and remain epidemic in most developing countries like Zambia. They have a profound impact on sexual and reproductive health. More than 1 million STIs are acquired every day worldwide most studies have looked at the inter-relationship between different STI. However very few studies have been done on the characterization of patients with multiple STIs. The aim of this study is to investigate the factors associated with multiple concurrent sexually transmitted infections at UTH.

Methods

No randomization was done to select participants as all eligible clients were enrolled from the UTH skin and venereal diseases clinic. Consent was obtained and an in-depth interview about their sexual practises was done.

Results

We assessed 129 clients followed at the Skin and venereal diseases clinic, from these a total of 38 (29%) patients were identified as having multiple STIs amongst whom 52% (20/38) were male. There was a slightly higher proportion of patients in the group with multiple STI self-reported as single 28% or 16 out of 57 clients compared to 17% of married people (8 out of 48 clients). There was a slightly higher number of patients with multiple STIs reported having more than 1 sexual partner (22 out of 40 patients with multiple STI i.e. 55% compared with 46 out of 89 patients who claimed to be in a monogamous relationship (52%)) only 1 participant identified as homosexual, and 4 participants self-identifying as bisexual. However, there were 13 participants who affirmed engaging in Anal Sex. The proportion of patients who had presented with multiple STIs in the group that affirmed anal sex was 8 out of 13 participants 61% (p=0.006).. 29 out of 38 participants 97%) who affirmed engaging in sex under the influence of alcohol had more than one STI and 9 of the 38 affirmed to engaging in sex under the influence of drugs.

Majority of the men in the study population had already undergone voluntary male medical circumcision (43 of 64 men in the cohort i e 67%). A higher proportion of the uncircumcised males were in the group with multiple STIs (10 out of 18 or 55%) compared with those who had multiple STIs despite being circumcised (11 out of 46 or 29%)

Conclusion

To conclude the factors associated with multiple STIs include, risky sexual behaviour such as multiple sexual partners, anal sex and lack of circumcision. We found no significant association with HIV status and level of education. We recommend therefore increased and targeted interventions using a risk-based assessment for STI screening and HIV prevention including in cooperation mandatory HIV testing in STI clinics, integration of PreP packages and routine self-genital sampling in high risk populations.

82. PATHWAYS TO CARE AND PREFERENCES FOR IMPROVING TUBERCULOSIS SERVICES AMONG TUBERCULOSIS PATIENTS IN ZAMBIA

Scientific Abstract (Oral)

Kerkhoff, A.D.[1], Kagujje, M.[2], Nyangu, S.[2], Mateyo, K.[3], Sanjase, N.[2], Chilukutu, L.[2], Eshun-Wilson, I.[4], Geng, E.H.[4], Havlir, D.V.[1], and Muyoyeta, M.[2]

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Introduction

Delays in the diagnosis of tuberculosis (TB) contribute to a substantial proportion of TB-related mortality, especially among people living with HIV (PLHIV). We sought to characterize the diagnostic journey for HIV-positive and HIV-negative patients with a new TB diagnosis in Lusaka, Zambia, to

understand drivers of delay, and characterize their preferences for service characteristics to inform improvements in TB diagnostic services.

Methods

We assessed consecutive adults with newly diagnosed, microbiologically-confirmed TB at two public health treatment facilities in Lusaka, Zambia – Kanyama First Level Hospital and University Teaching Hospital – from September 2019 to January 2020. We administered a survey to document critical intervals in the TB care pathway (time to initial healthcare-seeking, diagnosis, and treatment initiation), identify bottlenecks and their reasons. We quantified patient preferences for a range of features that could be implemented to improve TB diagnostic services using a discrete choice experiment (DCE) that assessed seven attributes (distance from home, wait times, hours of operation, confidentiality, sex of provider, TB testing incentive, TB test speed and notification method).

Results

Among 401 patients enrolled (median age of 34 years, 68.7% male, 46.6% HIV-positive), 60.9% and 39.1% were from a first-level and tertiary hospital, respectively. The median time from symptom onset to receipt of TB treatment was 5.0 weeks (IQR: 3.6-8.0) and was longer among HIV-positive patients seeking care at a tertiary hospital than HIV-negative patients (6.4 vs. 4.9 weeks, p=0.002). The time from symptom onset to initial presentation for evaluation accounted for the majority of time until treatment initiation (median 3.0 weeks, IQR: 1.0-5.0) – an important minority of 11.0% of patients delayed care-seeking ≥8 weeks. Most patients (86.8%) initially presented to a public health facility; reasons for choosing a health facility did not differ by HIV-status – proximity to home was most important (59.6%), followed by the perception that a facility offered good quality services (49.9%), privacy/confidentiality (41.7%), inexpensive services (39.2%), and had polite providers (37.9%). Most patients (54.1%) contemplated presenting earlier than they did – key reasons reported for delayed health-seeking were also similar regardless of HIV status: symptoms were not initially felt to be serious (91.2%), they thought symptoms were due to environmental causes (89.4%), they did not know the symptoms of TB (79.3%), they preferred to first try self-medication or home remedies (51.6%), and because they lacked sufficient time (49.6%). The DCE found that patients strongly preferred same-day TB test results (relative importance, 37.2%), facilities close to home (18.0%), and facilities with short wait times (16.9%). Patients were willing to travel to a facility up to 7.6 kilometers further or

wait an additional 8.2 hours in order to have access to a facility offering same-day TB test results. Preferences for improving current TB services did not differ according to HIV status.

Conclusion

Prolonged intervals from TB symptom onset to treatment initiation were common, especially among HIV-positive patients, and were driven by delayed health-seeking. Addressing known barriers to timely diagnosis and incorporating patients' preferences into TB service improvements, including same-day TB test results, may facilitate earlier TB care engagement in high burden settings.

83. THE NATIONAL TUBERCULOSIS CARE CASCADE - IDENTIFYING GAPS TO IMPROVE OUTCOMES

Scientific Abstract (Poster)

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Introduction

Tuberculosis (TB) remains a leading cause of morbidity and mortality among individuals in Zambia, especially people living with HIV (PLHIV). In this study we undertook a care cascade analysis to identify the largest gaps and align TB program improvement measures with areas of greatest need.

Methods

In this retrospective, population-based analysis, we derived national-level estimates for each step of the care cascade for individuals with active TB disease in Zambia in 2018. We characterized the overall cascade as well as disaggregated by drug-susceptibility results and HIV-status. Estimates were informed by WHO incidence estimates, nationally aggregated laboratory and notification registers, and individual-level program data from four out of the ten provinces.

Results

In 2018, the total burden of TB in Zambia was estimated to be 72,495 (range, 40,495-111,495) cases. Of these, 43,387 (59.8%) accessed TB testing, 40,176 (55.4%) were diagnosed with TB, 36,431 (50.3%) were started on treatment and 32,700 (45.1%) completed treatment. Among all persons with TB lost at any step along the care cascade (n=39,795), 29 108 (73.1%) were lost prior to accessing diagnostic services, 3211 (8.1%) prior to diagnosis, 3745 (9.4%) prior to initiating treatment and 3731 (9.4%) prior to treatment completion. PLHIV tended to have worse outcomes throughout the cascade and were less likely than HIV-negative individuals to successfully complete the TB care cascade (42.8% vs. 50.2%, $p<0.001$). Among those with rifampicin-resistant TB (n=1,740), there was substantial attrition at each step of the cascade and only 396 (22.8%) were estimated to have successfully completed treatment.

Conclusion

Losses throughout the TB care cascade resulted in a large proportion of individuals with TB not successfully completing treatment. Ongoing health systems strengthening and person-centered engagement strategies are needed at every step of the care cascade; however, scale-up of active case finding strategies is particularly critical to ensure individuals with TB in the population reach initial stages of care. In addition, a renewed focus on PLHIV and individuals with drug-resistant TB is urgently needed to improve TB-related outcomes in Zambia.

84. THE EFFICACY OF FISH AS AN EARLY COMPLEMENTARY FOOD ON THELINEAR GROWTH OF INFANTS AGED 6–7 MONTHS: A RANDOMISED CONTROLLED TRIAL

Scientific Abstract (Poster)

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Introduction

Fish is a good animal-source protein for growth and development. The main objective of the study was to assess the efficacy of fish during the early complementary feeding period on infants' linear growth in the Samfya district of the Luapula Province of Zambia in 6 months randomised controlled trial.

Methods

The study was conducted from April 2019 to January 2020. Infants aged 6–7 months (N = 238) were assigned to either the intervention (treatment) group or control (placebo) group to receive fish powder or sorghum powder, respectively. Participants were followed on a weekly basis to distribute the powder and record compliance/usage and any morbidities.

Anthropometric measurements were taken monthly. A linear mixed-effects model showed that fish powder improved linear growth among infants over all the 6 months of the intervention period.

Results

fish powder increased length-for-age z scores by 1.26 (95% CI: 0.94–1.57) and weight-for-age z score by 0.95 (95%CI 0.6–1.23).

Conclusion

The addition of fish powder to the infant's usual food during the early complementary feeding improves the infant's linear growth outcome.

85. ANALYSIS OF VITAMIN D AND ITS CORRELATION WITH INTERLEUKIN-6 IN COVID-19 PATIENTS AT MARY BEGG HEALTH SERVICES, ZAMBIA: IMPLICATION FOR PATIENT MANAGEMENT

Scientific Abstract (Oral)

Chileshe, M.[1], Mwamba, M.[1],Vernon, J.[1], Kwangu, M.[2] and Mubita, S.M.[1]

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Introduction

The emergence of SARS COV-2 and coronavirus disease 2019 (COVID-19) came without any known medication or treatment, thereby raising concerns for drug (therapeutics) research and development. Vitamin D is a potent immunomodulator with a proven protective effect against respiratory viral infections, and because of this, many studies have been carried out to evaluate the effects of vitamin D on COVID-19 infection, however, with varying conclusions.

Objective: To assess serum vitamin D levels and their correlation with IL-6 and other clinical characteristics among COVID-19 patients attended to at Mary Begg Health Services (MBHS).

Methods

This cross-sectional study was conducted among COVID-19 patients at MBHS. The study included 33 confirmed severe patients admitted to the intensive care unit, 45 patients with mild symptoms, and 45 healthy controls. The Kruskal–Wallis test was used to compare the median serum vitamin D levels among the three groups, and Spearman's correlations were performed to assess the correlation between serum vitamin D, IL-6, and clinical characteristics of the patients.

Results

The majority of COVID-19 patients in this study had optimal levels of vitamin D 44/78 (56.4%), with vitamin D deficiency being observed in only 6/78 (7.7%). Vitamin D levels in the control group were not significantly different when compared to levels measured in severe and mild COVID-19 patients, median [IQR], 31.33 ng/ml [25.9-39.56] compared to 29.97 ng/ml [26.19-37.45] and 31.9 ng/ml [26.12-38.34], p = 0.916, respectively. Severe COVID-19 patients admitted to the intensive care unit were older and had median higher IL-6 levels (43.67 ± 11.86 years vs. 33.89 ± 13.38 years; p = 0.001 and 27.56 pg/ml [13.13-47.81] vs. 8.34 pg/ml [5.1-21.63]; p = 0.0003, respectively) than patients with mild disease. A significant negative correlation between vitamin D and IL-6 (r = - 0.42; p = 0.016) was found in severe COVID-19 patients.

Conclusion

A negative (inverse) correlation between serum vitamin D and IL-6 was found in this study. Therefore, patients with severe COVID-19 might benefit from vitamin D supplementation, which would help to downregulate the cytokine storm and hence reduced disease severity.

86. INFLUENZA, RSV AND SARS-COV-2 SURVEILLANCE IN RURAL ZAMBIA FROM 2019-2021

Scientific Abstract (Oral)

Hamahuwa, M.[1], Sinywimaanzi, P.[1], Muleka, M.[1], Munachoonga, P.[1], Matakala, M[1], Morales, J.[2], Fenstermacher, Z.J.K. [3], Rothman, E.R. [3], Pekosz, A.[4], Monze, M.[5], Thuma, E.P.[1], Simulundu, E.[1], and Sutcliffe, G.C.[2,6]

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Introduction

Respiratory infections are a major cause of morbidity and mortality globally but are relatively understudied in sub-Saharan Africa. To assess their burden, surveillance for influenza-like illness (ILI), influenza virus and respiratory syncytial virus (RSV) was established in December 2018 at Macha Hospital in Zambia.

Methods

Here, we compared the burden of influenza A/B virus, RSV, and SARS-CoV-2 among outpatients before and during the COVID-19 pandemic. An age-stratified sample of patients with ILI were enrolled and a nasopharyngeal swab was collected and tested on-site using GeneXpert. The pathogen prevalence among outpatients with ILI was estimated through direct standardization using the age distribution of outpatients with ILI and the age-specific pathogen prevalence among participants.

Results

From January 2019 to December 2021, 61,735 outpatients were screened for ILI. The prevalence of ILI decreased from 16.9% in 2019 to 9.7% in 2020 to 6.9% in 2021. In 2019, influenza A virus was detected from April (prevalence: 8.3%) to November (14.0%), with a peak (50.4%) in August. Influenza B virus was detected from August (25.8%; peak) to November (13.0%). RSV was detected from January (24.0%) to May (5.6%), with a peak (64.0%) in March. In 2020, RSV was only detected in May (3.0%) and June (1.6%), and no cases of influenza A/B virus or SARS-CoV-2 were detected. The first COVID-19 case at Macha Hospital was detected on December 18, 2020. The pattern in 2021 was similar to 2019. Influenza A virus was detected from March (15.8%) to December (7.7%), with a peak (36.7%) in June. Influenza B virus was detected from June (6.4%) to December (11.3%), with a peak (54.3%) in September. RSV was detected from January (42.3%) to April (7.0%), with a peak (66.0%) in February. SARS-CoV-2 was detected throughout the year, with a peak (16.5%) in December.

Conclusion

In summary, this area has a significant burden of respiratory infections. COVID-19 mitigation measures reduced the burden of these pathogens in 2020 but they returned to prior levels in 2021, and co-circulated with SARS-CoV-2, once initial measures were eased in late 2020.

87. CLINICAL OUTCOMES AMONG INDIVIDUALS INFECTED WITH SARS-COV-2 IN RURAL ZAMBIA

Scientific Abstract (Poster)

Sinywimaanzi, P.[1], Sianyinda, M.[1], Hamahuwa, M.[1], Munachoonga, P.[1], Mueka, M.[1], Morales, J.[2], Fenstermacher, K.Z.J.[3], Monze, M.[4], Rothman,R.E.[2], Pekosz, A.[2], Thuma, P.E.[1],Simulundu, E.[1], and Sutcliffe, C.G.[2]

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Introduction

The long-term clinical effects of SARS-CoV-2 infection are not fully known and relatively understudied in sub-Saharan Africa.

Methods

A cohort study of individuals with laboratory-confirmed SARS-CoV-2 infection was initiated in rural Zambia at Macha Hospital in December 2020 after the first case was detected. The goal of this analysis was to describe clinical outcomes up to 12 months after acute infection among participants enrolled between December 2020 and March 2022. Individuals testing positive for SARS-CoV-2 through clinical testing or contact tracing were recruited within two weeks of testing, enrolled in the study, and followed for up to 12 months. Questionnaires were administered and chart reviews were performed at enrollment and on Day 30, 90, 180, and 365 to collect information on demographics, current symptoms and medical history.

Results

Overall, 132 participants were enrolled (median age: 34 years [range: 3 months to 79 years]; 45.8% female; 17.6% had received ≥1 dose of a COVID-19 vaccine). At enrollment, 120 participants (9.6%) reported having experienced at least one symptom, with the most common being cough (72.5%), headache (64.1%), fever (58.0%), rhinorrhea (48.9%), and body aches (48.1%). 52 participants (39.7%) had sought care prior to enrollment, including four participants (3.1%) who were hospitalized.

The proportion of participants reporting at least one symptom was 18.2% at Day 30 (n=110), 16.9% at Day 90 (n=77), 11.1% at Day 180 (n=63), and 18.9% at Day 365 (n=37). One participant (0.8%) was hospitalized after enrollment and died. The proportion of participants returning to normal activities was 77.3% at Day 30 (not including missing visits), 86.8% at Day 90, 88.7% at Day 180, and 97.3% at Day 365.

Conclusions

Most participants in this cohort of individuals with relatively mild SARS-CoV-2 infections returned to their normal activities within one month of acute infection. However, 10-20% of participants reported persistent symptoms up to one year after infection, which is generally consistent with other studies and demonstrates COVID-19's long-term impact on individual health.

88. PERCEPTIONS OF COVID-19 AND COVID-19 VACCINES IN RURAL ZAMBIA

Scientific Abstract (Oral)

Muleka, M.[1], Sinywimaanzi, P.[1], Sianyinda, M.[1], Hamahuwa, M.[1], Munachoonga, P.[1], Morales, J.[2], Fenstermacher, K.Z.J.[3], Rothman, R.E.[3], Pekosz, A.[4], Monze, M.[5], Thuma, P.E.[1], Simulundu, E.[1], and Sutcliffe, C. G.[6]

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Introduction

COVID-19 vaccines are highly effective public health tools to prevent COVID-19-related morbidity and mortality. However, coverage is low throughout much of sub-Saharan Africa, part due to vaccine hesitancy. In Zambia, the national vaccine campaign was launched in April 2021 and renewed in October 2021. To date, coverage is only approximately 20%.

Methods

Within the context of ongoing respiratory surveillance at Macha Hospital in rural Zambia, participants with influenza-like-illness (n=376) were asked about their perceptions of COVID-19 and COVID-19 vaccines between May 10, 2021 and May 31, 2022 (n=461). The goal of this analysis was to describe how perceptions changed over time. COVID-19 waves were defined based on national case counts as 'post-wave 2' (May 10 to 31 2021, n=44), 'wave 3' (Jun 1 to Aug 14 2021, n=61), 'post-wave 3' (Aug 15 to Dec 14 2021, n=178), 'wave 4' (Dec 15, 2021 to Jan 31 2022, n=94), and post-wave 4 (Feb 1 to May 31 2022).

Results

The proportion of participants reporting being worried that they or their family would get COVID-19 increased significantly from 67% in 'post wave 2' to 93% in 'post wave 4'. The proportion who did not believe COVID-19 was a serious illness decreased significantly from 88% to 65%. The proportion of participants reporting that they would get themselves or their child vaccinated was 40-55% in post-wave 2, wave 3 and post-wave 3, and then increased significantly to 72-80% in wave 4 and post-wave 4. Intentions to get themselves or their child vaccinated and perceptions that the vaccines were safe and effective were low and stable (35-47%) during post wave 2, wave 3, and post wave 3. They then increased significantly to 72-80% during wave 4 and post-wave 4. There was strong agreement between intentions to be vaccinated and to have their child vaccinated (Kappa: 0.85). Intending to be

vaccinated was significantly associated with a belief that the vaccine was safe and effective, but not with perceptions of COVID severity. Participants not wanting to be vaccinated were asked to provide reasons (n=161). The main reasons were concerns about vaccine safety (65%), getting COVID-19 from the vaccine (12%), and side effects (12%). Only one (2%) participant 18 years and older reported receiving a COVID-19 vaccine between May and November 2021. Between December 2021 and May 2022, this increased to 38% of participants 18-50 years of age and 53% of participants ≥51 years of age. Only one (7%) participant 12-17 years of age reported being vaccinated after December 2021 when vaccines became available for this age group.

Conclusion

Vaccine acceptability increased in rural Zambia at the end of 2021 as the national vaccine campaign was renewed, case counts increased, and perceptions about COVID-19 severity increased. These findings can inform strategies to improve vaccine uptake in Zambia.

89. GENOMIC SURVEILLANCE AND CHARACTERIZATION OF SARS-COV-2 IN SOUTHERN PROVINCE OF ZAMBIA

Scientific Abstract (Oral)

Katowa, B.[1], Kalonda, A.[2], Mubemba, B.[3], Matoba, J.[4], Changula, K.[5], Chitanga, S.[6], Muleya, W.[7] and Simulundu, E.[8]

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Introduction

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) the causative agent of the coronavirus disease 2019 (COVID-19) has become one of the greatest pandemics in the world with over 500 million cases and over 6 million deaths reported. So far, five variants of concern (VOCs), namely Alpha, Beta, Delta, Gamma and Omicron and their sublineages have been identified. These VOCs have been associated with waves of high transmission throughout the world. Timely identification of these variants is critical for the implementation of appropriate measures to curb further transmission. In this study, we conducted genomic surveillance of SARS-CoV-2 VOC circulating in the Southern Province of Zambia from December 2020 to April 2022.

Methods

The study samples were collected between December 2020 and April 2022 from eight districts in the Southern Province through the coordination of the Zambia National Public Health Institute and the Zambia Genomic Sequencing Consortium. Samples were brought to Macha Research Trust for Whole Genome Sequencing (WGS). WGS was performed using the Oxford Nanopore and NextSeq Illumina platforms. Thirty-six complete genomes were then subjected to phylogenetic analysis using maximum likelihood and Bayesian methods.

Results

Phylogenetic analysis showed evidence of local transmission and possible multiple introductions of SARS-CoV-2 VOCs in Zambia from different European and African countries. Genetic analysis of 36 SARS-CoV-2 whole genomes revealed the circulation of Alpha (B.1.1.7), Beta (B.1.351), Delta (AY.116) and multiple Omicron subvariants with the BA.1 subvariant being predominant. The Omicron variant (and its sublineages) was the most abundant the Beta variant accounted for about 17% of all the samples while the Delta and Alpha variants accounted for about 11% and 8% respectively. A total of 282 mutations were observed including 177 missense mutations, 64 synonymous mutations, 23 deletions, 6 insertions, 1 stop codon and 11 mutations in the non-coding region.

Conclusion

This study stresses the need for continued monitoring of SARS-CoV-2 circulation in Zambia, particularly in strategically positioned regions such as the Southern Province which could be at increased risk of introduction of novel VOCs.

90. ACCEPTABILITY AND FEASIBILITY OF CONDUCTING A SEROSURVEY DURING THE 2020 MASS VACCINATION CAMPAIGN IN ZAMBIA

Scientific Abstract (Oral)

Hamahuwa, M., Prosperi, C., Mutembo, S, Chongwe, G., Chilumba, I., Kapungu, K., Matakala, H., Musukwa, G., Mutale, I., Simulundu, E., Ndubani, P., Hasan, Z.A., Truelove, A.S, Winter, K.A, Carcelen, C.A, and Moss, J.W.

Introduction

Measles vaccine coverage using routine delivery systems and supplemented by mass immunization campaigns as needed help to close population immunity gaps. Serosurveys help identify immunity gaps in children under the age of five, although they are expensive and logistically challenging to conduct. Supplementary Immunization Activities (SIAs) provide an opportunity to easily identify and collect specimens and data from children in the age group of interest. Integration of surveys in the SIA platform has been avoided with a concern of them impacting the success of the SIAs. To address this gap, we explored the acceptability and feasibility of conducting a serosurvey during the 2020 measles and rubella SIA.

Methods

A measles and rubella serosurvey was nested in a nationwide measles and rubella SIA conducted in Zambia in November 2020, in conjunction with the bi-annual Child Health week meant to catch-up children who may have missed routine immunization during the COVID-19 pandemic. The survey was conducted at selected health facilities in two districts in Zambia; Choma District in Southern Province, which is primarily rural, and Ndola District in Copperbelt Province, which is primarily urban. All children aged 9 months to 5 years attending the SIA were eligible. Consent was obtained by trained study staff and a dried blood spot (DBS) sample was collected; a questionnaire was then administered to the mother in order to collect demographic information and vaccination history of

the child. To provide additional data on the acceptability and feasibility of the nested approach, in-depth and focus group interviews were conducted with vaccination teams and survey staff at the campaign sites. Transcripts were coded in Dedoose and analysed by the study team. Constant comparison and synthesis resulted in the major themes identified as part of evaluating the nested approach.

Results

Design and planning of the serosurvey relied on the campaign microplans, specifically estimates on the number of children expected and the planned days for the campaign at each location. However, during the campaign both of these aspects varied from our expectations, requiring survey teams to regularly adjust sampling intervals and daily targets to enroll children throughout the campaign. Overall, 74% and 90% of children approached at the campaign sites in Choma and Ndola districts, respectively, were successfully enrolled, with higher refusal at certain campaign sites. In terms of acceptability, social mobilization was critical for this serosurvey to ensure parents were comfortable giving blood, particularly during the COVID pandemic. In terms of feasibility, vaccination teams did not express any concerns that the serosurvey negatively impacted the SIA procedures or community participation. Both vaccination team and survey staff agreed coordination was vital to the integration of the serosurvey into the SIA.

Conclusion

To our knowledge, blood has never been collected during a measles and rubella SIA. Here we demonstrate the successful integration of blood collection to monitor population immunity to measles and rubella, which was feared to have decreased during the COVID pandemic. This nested approach could be used to monitor measles, rubella, and other childhood infectious diseases during future SIAs.

91. MEASLES IMMUNITY GAPS PERSIST AMONG CHILDREN, ADOLESCENTS AND YOUNG ADULTS LIVING WITH HIV IN ZAMBIA DESPITE HIGH MEASLES VACCINE COVERAGE AND ACCESS TO ANTIRETROVIRAL THERAPY: A NATIONWIDE, CROSS-SECTIONAL MEASLES AND RUBELLA SEROSURVEY

Scientific Abstract (Oral)

Mutembo, S.[1], Yang, Y.[1], Carcelen, A.[1], Winter, A.K.[3], Mwansa, F.D.[2], Chilumba, I.[4], Mutale, I.[4], Chongwe, G.[4], Monze, M.[5], Mulundu, G.[5], Nkamba, H.[5], Mulenga, L.[6], Hayford, K.[1], and Moss, W.J.[1,7,8]

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Introduction

High levels of population immunity are needed to interrupt measles virus transmission and small clusters of susceptible individuals can sustain measles outbreaks. Although the most important obstacle to measles control and elimination is low vaccination coverage with two doses of a measles-containing vaccine, increasing numbers of people living with HIV (PLHIV) may result in more susceptible individuals and enhance the risk of measles outbreaks.

Methods

A provincially representative subsample of specimens was selected from the Zambia Population HIV Impact Assessment survey (ZAMPHIA) biorepository, a 2016 national HIV survey in Zambia, and tested for IgG antibodies to measles and rubella viruses by enzyme immunoassay. Hierarchical generalized additive models were fit to characterize age-specific measles and rubella seroprevalence profiles by HIV infection status, and log-binomial regression was performed to assess associations between measles and rubella seroprevalence and HIV infection status and associated risk factors.

Results

Of the 25,383 specimens in the ZAMPHIA biorepository, 11,500 specimens were selected and 9,852 (85%) were tested for measles and rubella IgG antibodies. Measles seroprevalence was lower among children, adolescents, and young adults living with HIV compared with HIV-uninfected participants younger than approximately 30 years. Measles seroprevalence was only 47.2% (95% CI: 32.7%, 61.7%) among children younger than 10 years living with HIV compared to 76.4% (95% CI: 74.9%, 78.0%) among HIV-uninfected children in the same age category. In contrast, rubella seroprevalence was higher among PLHIV than HIV-uninfected individuals, particularly for children younger than 10 years of age (68.6% vs. 44.3%, $p<0.001$).

Conclusions

This is the first report of measles and rubella seroprevalence by HIV infection status based on a nationally representative sample and demonstrates persistence of measles immunity gaps among children, adolescents and young adults living with HIV in a country with high measles vaccine coverage and access to antiretroviral therapy. These findings highlight the need to implement the World Health Organization policy that children living with HIV be revaccinated against measles following immune reconstitution with antiretroviral therapy.

92. LEVERAGING A NATIONAL BIOREPOSITORY IN ZAMBIA TO ASSESS MEASLES AND RUBELLA IMMUNITY GAPS ACROSS AGE AND SPACE

Scientific Abstract (Oral)

Monze, M.[1], Carcelen, A.C.[2], Winter, A.K.[3], Moss, W.J.[2,4,5], Chilumba, I.[6], Mutale, I.[6], Chongwe, G.[6], Mulundu, G.[1], Nkambaa, H., Mwansa, F.D.[8], Mulenga, L.[8], Rhoda, D.A.[9], Hayford, K.[2], and Mutembo, S.[2]

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Introduction

High-quality, representative serological surveys allow direct estimates of immunity profiles to inform vaccination strategies but can be costly and logistically challenging. Leveraging residual serum samples is one way to increase their feasibility. Biorepositories can provide a valuable data source for estimating immunity profiles to many infectious diseases, including SARS-Cov-2. The study set out to leverage a provincially representative biorepository of blood samples collected to conduct a nested serosurvey to estimate population immunity to measles and rubella for all ten provinces in Zambia.

Methods

We subsampled 9854 residual sera collected in 2016 as part of the Zambian Population HIV Impact Assessment (ZAMPHIA) study and tested these specimens for anti-measles and anti-rubella virus IgG antibodies using indirect enzyme immunoassays. We demonstrate innovative methods for sampling residual sera and analyzing seroprevalence data, as well as the value of seroprevalence estimates to understand and control measles and rubella.

Results

National measles and rubella seroprevalence for individuals younger than 50 years was 82.8% (95% CI 81.6, 83.9%) and 74.9% (95% CI 73.7, 76.0%), respectively. Despite a successful childhood vaccination program, measles immunity gaps persisted across age groups and districts, indicating the need for additional activities to complement routine immunization. Prior to vaccine introduction, we estimated a rubella burden of 96 congenital rubella syndrome cases per 100,000 live births.

Conclusions

Residual samples from large-scale surveys can reduce the cost and challenges of conducting serosurveys, and multiple pathogens can be tested. Procedures to access quality specimens, ensure ethical approvals, and link sociodemographic data can improve the timeliness and value of results. This biorepository provides population immunity levels prior to the COVID-19 pandemic and could be used to assess the impact of the pandemic on vaccine preventable diseases and any disruptions to the routine immunization system.

93. HIV TEST AND TREAT POLICY INCREASES RETENTION ON ART IN ZAMBIAN ADULTS. A MULTI-SITE CROSS SECTIONAL TIME SERIES ANALYSIS

Scientific Abstract (Oral)

Mutembo, S.[1], Masenga, S.K.[2], Sikazwe, L.[4], Sakala, M.[4], Mweemba, G.[4], Mvula, J.[4], Kunda, S.[4], Kabesha, S.[4], Cheeelo, C.[2], Fwemba, I.[3], and Hamooya, B.M.[2]

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Introduction

Globally, most countries are working towards achieving the UNAIDS 95-95-95 targets using the test and treat policy as the main strategy. However, the impact of this strategy has not been critically appraised in many settings. We evaluated retention and clinical outcomes of adults enrolled on antiretroviral therapy (ART) and assessed the impact of the test and treat policy.

Methods

We conducted a cross sectional time series data analysis in 6,909 individuals who initiated ART between January 1st, 2014 - July 31st, 2016 (before test and treat cohort (BTT), n=3,143 (45.9%)) and August 1st, 2016 - October 1st, 2020 (after test and treat cohort (ATT)). The study was conducted in 42 health facilities in 12 districts of Southern province. The primary outcome was retention, defined as regular attending of appointments or engagement with the ART clinic at 3, 6, 12, 24 and ≥24 months after ART initiation. We assessed reasons for attrition which included death, lost to follow-up (LFTU), and transfer out. The proportion of viral suppression was calculated at different time intervals. To assess factors associated with retention, we used logistic regression (xtlogit model).

Results

Females were the majority (60% BTT and 61% ATT). The median age was 40 years (interquartile range (IQR): 34 - 47) and 37 years (IQR: 30 - 45) in BTT and ATT cohorts, respectively. Overall retention was 83.4%, being higher in the ATT cohort (90.4% vs. 75.1%, p<0.001). At all-time intervals retention was significantly higher in the ATT cohort (Table1). The reasons for attrition were transferred out (0.2%), LTFU (9.5%) and death (0.8%). Viral suppression at 6, 12 and 24 months was 80.4%, 92.2% and 94.7%, respectively. Retention was significantly associated with cohort, increasing age, facility location, marital status, and baseline ART regime.

Conclusion

Retention on ART is higher in the ATT cohort than the BTT cohort. LTFU was the most common reason for attrition. Viral suppression was lower than the 95% target by 12 months of follow up. Our

findings highlight improved ART retention after implementation of the test and treat policy but there is still a lag in viral suppression.

94. ESTIMATING MEASLES SEROPREVALENCE BY PROVINCE USING RESIDUAL SERA FROM THE FEVER RASH SURVEILLANCE SYSTEM: A SMALL AREA ESTIMATION APPROACH

Scientific Abstract (Oral)

Fwemba, I.[1], Mwaka, M.[2], Mulundo, G.[2], Nkamba, H.[2], Mwansa, F.D.[3], Sakala, C.[3], Bobo, P.[3], Moss, W.J.[4], Prosperi, C.[4],Carcelen, A.[4], Mutembo, S.[4], and Winter, A.[4]

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Introduction

The last national measles outbreak took place in 2010-2012. Since then, routine measles vaccination coverage with two doses has been increasing and reported measles cases have been low (<15 annual cases per million). However, the underlying national and provincial measles seroprevalence profiles are unknown. Knowledge of measles immunity profiles inform vaccination strategies that can effectively reduce transmission and outbreak risk. Serological data that measures measles virus-specific immunoglobulin G (IgG) directly estimate population seroprevalence. Serum collected via Zambia's fever rash surveillance system provide a reliable source of sera which can be expanded to cover the entire country. However, the age and spatial scope of the data and the sample size depends entirely on the surveillance system, and where the outbreak occurs. Additionally, there remains a critical question about the representativeness of the sera collected from patients presenting to health care facilities with fever and rash symptoms. We conducted a nested serological survey, testing 2,052 serum samples collected via the fever rash surveillance system for measles-virus specific IgG antibodies. We use small area estimation and additional data sources to improve our estimates of measles seroprevalence at the provincial level.

Methods

Data: Serum samples collected via the fever rash surveillance system are sent to the University Teaching Hospital to test for IgM antibodies to measles and rubella viruses. The residual serum was then stored at -80oC. We tested all available residual sera collected between 2015 and 2020 for measles IgG antibodies (N=2,052) using a commercial enzyme immunoassay. To reduce the potential for bias, we excluded samples that tested positive for measles IgM antibodies and samples collected from individuals younger than 15 years old. Analytics: Achieving adequate precision of provincial level measles seroprevalence requires either a substantial increase in survey sample size (not possible given this surveillance system) or use of model-based estimation capable of incorporating other pre-existing data. We used a small area estimation model to estimate sub-national seroprevalence. We evaluated model fit using a range of covariates including measles seroprevalence data from a serosurvey nested in the 2016 ZAMPHIA survey (N=9,852) sampled to be provincially representative, population estimates, and socio-demographic and epidemiologic indicators from the 2018 Zambia Demographic and Health Survey.

Results

Covariates in the best-fitting model included seroprevalence estimates from the ZAMPHIA survey, measles vaccination coverage, and sex. The nested ZAMPHIA serosurvey data was a superior auxiliary covariate and provided substantially improved precision in many provincial-level estimates of measles seroprevalence. We estimated that Northern Province had the highest measles seroprevalence of 87% among individuals younger than 15 years old, followed by Western Province at 86%, while Luapula and Eastern Provinces at about 79%. Surprisingly, inclusion of a provincial-level spatial autoregressive covariance structure did not result in improved estimation.

Conclusion

Provincial estimates of measles seroprevalence are useful for evaluating within-country heterogeneities, tracking progress towards measles elimination, and identifying areas in need of improved or supplemental vaccination strategies. Fever rash surveillance systems can be leveraged by testing residual serum for IgG antibodies. Given the limitations of residual serum from some routine surveillance systems, small area estimation approach can help improve estimates and inform vaccination programs.

95. THE PERFORMANCE OF COMPUTER AIDED DETECTION DIGITAL CHEST X-RAY READING TECHNOLOGIES FOR TRIAGE OF ACTIVE TB AMONG PERSONS WITH A HISTORY OF PREVIOUS TB

Scientific Abstract (Oral)

Kagujje, M.[1], Kerkhoff, A.D.[2], Nteeni, M.[3], Dunn, I.[4], Mateyo, K.[5], and Muyoyeta, M.[1]

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Introduction

Digital Chest X-ray (dCXR) computer-aided detection (CAD) technology uses lung shape and texture analysis to determine probability of TB. However, many patients with previously treated TB have sequelae, which also distort lung shape and texture. We evaluated the diagnostic performance of two CAD systems for triage of active TB in patients with previously treated TB.

Methods

We conducted a retrospective analysis of a cross-sectional active TB case finding study. Participants ≥15 years, with ≥1 current TB symptom, and with complete data on history of previous TB, dCXR, and TB microbiological reference (Xpert MTB/RIF) were included. dCXRs were evaluated using CAD4TB (version 7.0) and qXR (version 3.0). We determined the diagnostic accuracy of both systems, overall and stratified by history of TB, using a single threshold for each system that achieved 90% sensitivity and maximized specificity in the overall population and the abnormality thresholds required to achieve 90% sensitivity in each sub-population.

Results

Of 1,884 participants, 452(24.0%) had a history of previous TB. The prevalence of microbiologically confirmed TB among those with and without history of previous TB was 12.4% and 16.9% respectively. Using CAD4TB (cutoff 15), the sensitivity and specificity was 89.3%(95%CI:78.1-96.0)

and 24.0%(95%CI19.9-28.5) and 90.5%(95%CI:86.1-93.3) and 60.3%(95%CI:57.4-63.0) among those with and without previous TB, respectively. Using qXR (cutoff 6), the sensitivity and specificity was 94.6%(95%CI:85.1-98.9) and 22.2%(95%CI:18.2-26.6) and 89.7%(95%CI:85.1-93.2) and 61.8%(95%CI:58.9-64.5) among those with and without previous TB, respectively. Abnormality thresholds required to achieve 90% sensitivity differed by previous TB status, sex and HIV status for each CAD system and were associated with poor-to-moderate specificity.

Conclusion

The accuracy of CAD systems as a triage tool is decreased among those previously treated for TB.

96. REPORTED ATTENDANCE AND MASK WEARING AT LARGE GATHERINGS IN RURAL ZAMBIAN COMMUNITIES DURING COVID-19

Scientific Abstract (Poster)

Juntunen, A.[1], Kaiser, J.L.[1], Ngoma, T.[2], Hamer, D.H.[1,3,4,5], Fink, G.[6], Rockers, P.C.[1], Biemba, G.[7], and Scott, N.A.[1]

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Introduction

The Zambian Ministry of Health announced a statutory order and instituted COVID-19 prevention behavior guidelines for social gatherings prior to the first confirmed case on March 18, 2020.

Guidelines included non-pharmaceutical interventions (NPIs) such as mask wearing, social distancing, hand washing, and reducing sizes of gatherings. Messaging and sensitization efforts were communicated through public broadcasting, social media campaigns, and other media. We examined how rural community members behaved throughout the COVID-19 pandemic. We aimed to understand how behaviors and perceptions of risk changed as the landscape of COVID-19 evolved over time.

Methods

Participants in a trial of community-based parenting groups (CBPG) conducted in 4 rural districts (Kalomo, Choma, and Pemba in Southern province; Nyimba in Eastern province), were invited to respond to a quantitative questionnaire about COVID-19 at each CBPG they attended. Questionnaires asked about participation and behaviors at various types of community gatherings 2 weeks before the interview. We constructed a timepoint variable to coincide with multiple COVID-19 peaks in Zambia: Timepoint 1 (T1, Aug-Dec 2020), Timepoint 2 (T2, Jan-Mar 2021), Timepoint 4 (T4, Jul-Sep 2021); During Timepoint 3 (T3 Apr-Jun 2021) cases were receding. We calculated adjusted odds ratios (aOR) with 95% confidence intervals (CI) for the primary outcomes of self-reported mask use and perceived mask use of peers.

Results

We collected 5,711 observations between August 2020 and September 2021. All respondents were female, had a mean age of 28 years, and 82% were married. Respondents reported their unique perceptions and behaviors at a total of 9,607 community gatherings: 2,297 (42%) church services, 4,073 (24%) clinic visits, 1,760 (18%) funerals, and 1,575 (16%) other events including weddings, football games, and meetings with traditional leaders. Over 83% of respondents attended a community gathering in the 2 weeks prior to completing the questionnaire; 51% attended more than one. Church was the most attended gathering type overall (71%). Self-reported mask wearing was highest at clinics (84%) and church services (81%). Funerals were attended by 200-300 people, but individuals were 55% less likely to report wearing masks than those attending a clinic visit (aOR = 0.44, 95% CI [0.3, 0.6]). Compared to T1, the odds of self-reported mask wearing were higher in T2 (aOR=1.5, 95% CI ([1.3, 1.7]) and T4 (aOR=3.0, 95% CI [2.5, 3.5]) which broadly overlay two major COVID-19 peaks. Additionally, the odds of mask wearing decreased as distance from the health facility increased; those living more than 15 km away were 43% less likely to wear a mask compared to those living less than

5 km away (aOR=0.57, 95% CI [0.4, 0.7]). Respondents from Eastern province more often reported feeling at high risk (41%) compared to those in Southern province (5%). Perception of risk in both provinces generally increased over the study period.

Conclusion

Results suggest guideline awareness of the importance of mask use penetrated these rural communities. However, there is a need to optimize messaging to increase compliance to NPIs at high-risk gatherings. These findings should be considered as the COVID-19 pandemic continues to evolve.

97. KNOWLEDGE, MOTIVATORS, DEMOTIVATORS, AND BEHAVIOR SKILLS FOR COVID-19 PREVENTION BEHAVIORS IN RURAL ZAMBIA

Scientific Abstract (Oral)

Kaiser, J.L.[1], Hamer, D.H.[2], Juntunen, A.[3], Ngoma, T.[1], Schueler, J.[1], Rockers, P.C.[1], Fink, G.[4], Biemba, G.[5], and Scott N.A.[6]

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Introduction

In early 2020, the Zambian Ministry of Health (MoH) issued guidelines encouraging the use of multiple non-pharmaceutical interventions (NPIs) to slow the transmission of the SARS-CoV-2 virus. Changing health behaviors directly or indirectly can be difficult in many circumstances, particularly in

the absence of tangible, immediate harms. This has proved true for many COVID-19 prevention behaviors. While knowledge, attitude, and practice studies for COVID-19 are now widespread, few studies have explored these aspects in greater depth against known behavior change models or in the rural Zambian context. In this study we assessed community knowledge, motivations, behavior skills, and perceived community adherence to COVID-19 prevention behaviors (i.e. hand hygiene, mask wearing, social distancing, and limiting gatherings) in four rural districts (Choma, Kalomo, Pemba, and Nyimba).

Methods

Within a larger cluster-randomized controlled trial, we conducted in-depth interviews with health center staff (n=19) and community-based volunteers (n=34) and focus group discussions with community members (n=281) in November 2020 and April 2021. We conducted a content analysis in Nvivo v12 and interpreted the data against the Information-Motivation-Behavior Skills Model, adapted for this study and context.

Results

Generally, all respondent groups showed good knowledge of COVID-19 symptoms, spread, high-risk activities, and prevention methods, though some gaps existed around asymptomatic transmission and the loss of smell/taste as a symptom. Lack of soap in rural communities was a barrier to appropriate hand hygiene technique. Few respondents discussed wearing masks over both the nose and mouth or choosing to avoid crowded settings. Performance of prevention behaviors was driven by personal and social factors: different factors motivated adherence or non-adherence, which was moderated by epidemic severity and its associated media coverage. Respondents described institutional settings (e.g. clinics and church) as having higher levels of perceived adherence to prevention behaviors. These settings had stronger adherence enforcement measures in place and clear leaders who supported adherence. Conversely, informal, community settings (e.g. weddings, funerals, football matches) lacked similar social and leadership expectations for adherence and had lower perceived levels of adherence. These settings often involved higher emotions (excitement or grief) and many involved alcohol use, resulting in community members "forgetting" to abide by guidelines. Doubt about COVID-19 existence or severity was widely discussed as a persistent driver of non-adherence in this context. Respondents received information primarily at community gatherings through local leaders;

community members also reported hearing announcements over the radio. These communities lacked access to tv broadcasts, social media, and other visual sources of COVID-19 information.

Conclusions

COVID-19 information successfully penetrated these very remote, rural communities; however more targeted messaging may be needed to address persistent COVID-19 doubt and misinformation. Engaging local leaders in religious, civic, and traditional leadership positions to monitor health behaviors in high-risk, low adherence settings could improve community behaviors without adding additional monitoring duties on an already overburdened, resource-limited health system. Improving access to soap in these communities may also improve general health and wellbeing during and after the current COVID-19 pandemic.

98. UNWANTED PREGNANCIES AND UNSAFE ABORTION AMONG IN SCHOOL ADOLESCENTS: A CASE STUDY OF LIVINGSTONE

Scientific Abstract (Poster)

Chansa, I.[1], Sibeene, E.[1], Ndubakwenda, M.[1], and Kasengele, C.T.[2]

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Introduction

The integration of CSE into school curriculums only supports the information side leaving the support and services aspects weak. This makes adolescents vulnerable to unwanted pregnancies and unsafe abortions given the stigma and discrimination associated with premarital conception. Main Question/hypothesis: 'To investigate the role of teachers as support structures in solving issues of unwanted pregnancies and unsafe abortion.

Methods

'This was an exploratory qualitative study, conducted in Livingstone District, Southern province in 2021. Twenty (20) FGD were conducted with in school adolescent girls (n=200), 31 Key informant interviews with guidance and counselling teachers (n=10), pharmacists (n=6) and adolescent focal point persons (n=15). Data was analyzed using thematic analysis with the aid of NVivo. The study

integrates a gender transformative approach, leaving no one behind in attaining equity universal coverage.

Results

'Teachers are better placed to act as support structures to solve issues of unwanted pregnancies and unsafe abortions among in school adolescents though, but this depends on the perceived burden this would bring to the teachers in addition to their work. The findings from the study also showed that parents have a huge role to play and the community at large.

Teachers felt they could address unwanted pregnancies and unsafe abortion among in school adolescents in collaboration with other stakeholders such as parents, healthcare workers, law enforcement offices, and the adolescents themselves.

Conclusion

A system's approach at all levels in solving issues of unintended pregnancies and unsafe abortions among in school adolescents is ideal. There is need to build the capacity of teachers in adolescent friendly methodologies.

99. STRATEGY TO SCALE UP HEPATITIS ELIMINATION ACTIVITIES THROUGH HEALTH WORKFORCE EDUCATION PROGRAM IN ZAMBIA

Best Practices Abstract (Poster)

Ginwalla, R.[1], Sinkala, E.[1,2], Fwoloshi, S.[1,2] Kawana, W. [1,2], Kanunga, A.[1], Chirwa, R.[1], Chama, E.[1], Mulenga, L.[1,2,3], Vinikoor, M.[1,3,4]

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Introduction

Chronic viral hepatitis is neglected in sub-Saharan Africa, including Zambia. While evidence-based tools exist to screen for, treat, and prevent hepatitis B and C virus infections, implementation has been slow largely because of the knowledge gaps. Lack of local expertise in viral hepatitis management is a major problem. Health workers often lack competency to manage hepatitis and awareness of the condition among the general population is very limited. In Zambia, we established an integrated, cost-effective, decentralized program to train health workers in HBV evaluation and management in an effort to target hepatitis elimination. We present our preliminary experience and results.

Methods

We targeted 3 groups of health workers with hepatitis education. First, we recruited a group of 'hepatitis expert trainees', who are medical officers based in Lusaka who were undertaking specialty clinical training to be cross-trained on a part-time basis in viral hepatitis. Expert trainees joined weekly didactic lectures on hepatitis B natural history and management, presented clinical cases, and attended an HBV clinic supervised by an expert. They were also trained as facilitators in Extension for Community Health Care Outcomes (ECHO), a distance clinical training tool that utilizes virtual meeting platforms in a hub and spoke model, and attended a sub-Saharan Africa wide ECHO. After six months expert trainees were allowed to deliver lectures, manage HBV patients with minimal supervision, and lead Project ECHO sessions for a national audience. The second group were HIV/TB focused clinical mentors, based in 4 provinces, whose main role is to provide clinical mentorship to staff across various facilities under provincial health offices. During their quarterly meetings in Lusaka, a day-long session on hepatitis was added. In addition, HIV/TB mentors joined bi-weekly virtual meetings/trainings. The third group targeted were front-line health workers (including medical and clinical officers, nurses, pharmacists) at the 310 facilities in Zambia that participated in the MoH's national ECHO program. Every 2-3 months, they were invited to a hepatitis ECHO session.

Results

From September 2021 to August 2022, 37 expert trainees initiated the program, and 32 remain active. Among active trainees, an average of 14 lectures and 12 clinic sessions were attended, and an average of 39 hepatitis patient visits/trainee occurred. In addition, 28 were certified as Project ECHO

facilitators and 9 have served as facilitators or expert discussants during a national ECHO session to date. We also engaged 80 HIV/TB mentors from Eastern, Lusaka, Southern, and Western Provinces, and of them, 52 attended at least 3 training activities. Finally, we reached 511 unique health workers (a larger number logged in but did not register) across all 10 Zambian provinces through the delivery of 4 hepatitis ECHO sessions. ECHO sessions were attended by an average of 312 health workers.

Conclusion

Leveraging existing healthcare workforce programs such as the ECHO model and HIV/TB mentorship program to scale-up hepatitis B education and training was feasible, had national reach, and promises to catalyze strides toward hepatitis B elimination in Zambia.

100. EVALUATION OF THE SARS-COV-2 DIAGNOSTICS AND THE IMPACT OF CO-MORBIDITY ON MANAGEMENT AND OUTCOMES OF COVID-19 IN ZAMBIA

Scientific Abstract (Poster)

Tembo, J.[1], Egbe, N.F.[2], Maluzi, K.[1], Mulonga, K.[1], Chilufya, M.[1], Kapata, N.[3], Mukonka, V.[3], Edgar Simulundu, E.[4], Zumla, A.[5], Fwoloshi, S.[6], Mulenga, L.[6], Pallerla, S.R.[7], Velavan, T.P.[8], and Bates, M.[9]

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Introduction

To conduct a diagnostic validation study of SARS-CoV-2 diagnostic kits which were widely used in the early phases of the COVID-19 pandemic.

Methods

We compared SARS-CoV-2 diagnostic test results from 3 RT-PCR assays used at the time the Panther Fusion® assay, Da An Gene's 2019-nCoV RNA kit and Maccura's PCR Kit with Altona RealStar RT-PCR kit which served as the gold standard. We also evaluated results from rapid antigen testing.

Results

We recruited 244 participants 61.1% (149/244) were positive by at least one PCR assay. Da An Gene, Maccura and Panther Fusion assays had sensitivities of 0.0% (95%CI 0-41%), 27.1% (95%CI 15-42%) and 76% (95%CI 65-85%) respectively but specificity was low (<85% for all three assays). HIV and TB patients weren't more likely to be SARS-CoV-2 PCR positive, being Female (OR 0.5 (0.3-0.9), p = 0.026) and Chronic Pulmonary Disease (0.1 (0.0-0.8), p = 0.031), were associated with lower odds of being PCR positive. 84% of 44 samples sequenced were Beta variants.

Conclusions

Local diagnostic validation studies should be embedded in outbreak preparedness plans, to ensure that molecular diagnostic assays that do not meet performance thresholds, can be discontinued and resources put behind the best performing tests.

101. AN ASSESSMENT OF PERCEPTION OF METRO MANILA RESIDENTS AND WORKERS ON THE EFFECTIVENESS AND IMPLEMENTATION OF COVID-19 CONTACT TRACING TECHNOLOGIES

Scientific Abstract (Poster)

Pichay, C.D[1]., Pera, R.O.[1], Reyes, E.M.[1], Rodriguez, J.P.[1], Romero, L.O.[1], Sangalang, A.E.[1], Santiago, C.M.[1], Santiago, M.D.[1], Santiago, M.C.[1], Roldan, M.M.[2], and Ramos, R.P.[2]

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Introduction

In response to the COVID-19 pandemic, contact tracing became one of the main control measures in fighting the spread of the virus. The World Health Organization (WHO) mentioned that contact tracing remains a key and effective strategy in disrupting the chains of transmission of SARS-CoV-2 and reducing the COVID-19-associated mortality. This study aimed at assessing the perception of individuals and establish the factors affecting the implementation and effectiveness of available COVID-19 contact tracing strategies and technologies in the Philippines.

Methods

This quantitative research study utilized a 28-item descriptive survey divided into three parts - sociodemographic profile, implementation, and effectiveness. The researchers used Slovin's Formula with a 95% confidence level to compute the sample size of 400. A frequency table and multivariate regression analysis were then used to interpret the data collected.

Results

Metro Manila residents and workers strongly agree on the convenience of using their mobile device's camera to scan QR codes. However, they strongly disagree that contact tracing applications allow interoperability. Contact tracing promotional materials on social media have a better perception of the implementation ($\beta=0.236$, $p<0.001$) and effectiveness ($\beta=0.247$, $p=0.005$) of the contact tracing. Furthermore, those who prefer using pen and paper to write personal information in the contact tracing form consider ($\beta=0.268$, $p<0.001$) contact tracing more effective. However, they tend to disagree ($\beta=-0.185$, $p<0.001$) with the implementation.

Conclusion

This study showed that respondents give a somewhat agreeable perception of the implementation and effectiveness of COVID-19 contact tracing strategies and technologies in the Philippines. The need for a standardized contact tracing application is acknowledged upon data analysis. Furthermore,

increasing promotional advertisements regarding contact tracing applications on social media can help influence the implementation of a standardized contact tracing application.

102. MEASLES AND RUBELLA SEROPREVALENCE AND VACCINATION COVERAGE AMONG CHILDREN ATTENDING A SUPPLEMENTAL IMMUNIZATION CAMPAIGN IN ZAMBIA

Scientific Abstract (Oral)

Mutale, I.[1], Truelove, S.A.[2,3], Hamahuwa, M.[4], Prosperi, C.[2], Chongwe, G.[1], Mwansa, F.D.[5], Simulundu, E.[4], Ndubani, P.[4], Chilumba, I.[1], Kapungu, K.[1], Matakala, H.[4], Musukwa, G.[4], Betha, E.[1], Kampamba, L.[1], Munachoonga, P.[4], Hasan, A.Z.[2], Winter, A.K.[3,6], Sakala, C.[5], Bobo, P.[5], Carcelen, A.C.[2], Moss, W.J.[2,3], and Mutembo, S.[2]

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Introduction

Measles and rubella (MR) supplemental immunization activities (SIA) may provide additional doses largely to children previously vaccinated through the routine immunization program and little is known of the proportion of susceptible children vaccinated during measles SIAs. Post-coverage evaluation surveys, conducted shortly after an SIA, estimate the additional value in terms of vaccination coverage but cannot address if the SIA reached children seronegative to MR viruses. This

study was set out to measure the proportion of children vaccinated during the MR SIA who are seronegative to MR viruses at selected SIA vaccination sites.

Methods

A descriptive cross-sectional serosurvey was conducted in two districts of Zambia (Choma District, Southern Province and Ndola District, Copperbelt Province) during the November 2020 MR SIA nested in the Child Health Week at selected vaccination sites, including static sites at health centers and outreach sites. Children were systematically sampled for the survey from the pool of all children aged 9 months to 5 years attending the SIA but the sampling interval varied by vaccination site based on the number of children seen at the site. Consent was obtained from parents or guardians by trained study staff and a dried blood spot (DBS) was collected. A questionnaire was administered by a nurse to the parent or guardian to collect the child's vaccination history. Samples were tested for MR IgG antibodies using an enzyme immunoassay by the teams from MRT and TDRC. We estimated MR vaccination coverage and seroprevalence, and explored differences by campaign setting (fixed or outreach; rural or urban) and which day they presented to the SIA.

Results

A total of 2,400 children aged 9 months to 5 years were enrolled in the survey. Among these children, 91% reported receiving at least one dose of MR vaccine before the campaign, either via card or recall. History of prior vaccination differed across campaign sites (73% to 99%), and by day of campaign and type of site. Forty-five percent of children aged <1 year presenting to the SIA were receiving their first MR dose. Measles and rubella antibodies were detected in approximately 86% and 90% of children attending the SIA, respectively, although this decreased to approximately 50% among children aged <1 year. Measles antibodies were detected in 84% of children aged 12-18 months and 89% of children older than 18 months. Twenty-two percent of parents reported having delayed vaccination due to the COVID-19 pandemic.

Conclusion

Although most children reached by the SIA had already received at least one dose of the MR vaccine, the overall seropositivity of 86% for measles is below the herd immunity threshold (95%) required to interrupt measles virus transmission. The findings provide critical insight into how efficient and effective the SIA was in addressing population immunity gaps. A limitation of this study is that

children vaccinated through the SIA may not be representative of the general population. However, nesting a serosurvey within an SIA provided a valuable platform for assessing population immunity against vaccine preventable diseases and collecting disease surveillance data and specimens, especially during public health emergencies when other types of community-based surveys may not be feasible. To our knowledge, this was the first serosurvey nested in an SIA, providing direct measurement of the efficiency of these campaigns at vaccinating seronegative children.

103. INCREASED HIV POSITIVITY RATE IN OLDER PLHIV IN LUAPULA AND NORTHERN AND MUCHINGA PROVINCES.

Best Practices Abstract (Oral)

Mumbalanga, M.[1], Marie-Chantal, U.[1], Constance Wose, K.[2], Charles, C.[2], Mwango, A.[1], Mwala, P.[1], and Chirwa, B.[1]

USAID Zambia

Introduction

According to the ZAMPHIA preliminary results, 2021, Zambia reached the 90-90-90- UNAIDS targets with the 2nd and 3rd 90% in linkage to treatment and virally suppression of PLHIV, compared to the 1st 90% where identification of identifying PLHIV was below the 90% target, and as such finding new positives will require targeted testing with high yielding modalities. USAID Action HIV is implementing the HIV, Prevention, Care, and treatment program in Muchinga, Luapula and Northern Provinces.

We characterized clients with high positivity rates in Muchinga, Luapula and Northern Provinces

Methods

Men and women were offered and tested for HIV at different Service Delivery points using different testing modalities namely, Index testing, IPD, OPD, PMTCT and VCT. Clients who test HIV positive were linked to ART and those negative to prevention services

Baseline viral load was undertaken on a subset population and further analyzed and in turn frequencies were done by age and sex.

Frequencies for HIV positivity were calculated and compared by age, sex, geo location and by testing modalities.

Results

A total of 326,203 clients were tested for HIV with more females than males (62% female and 38% male), with an HIV positivity rate of 7% (24,160). From the overall tests, the highest contribution was 40% from Northern Province and Luapula 37% while Muchinga was at 24%.

High positivity rate increased with age with the yield observed among 30+ year old, with statistically significant difference (P Value= 0.001) in females and males (14% male vs 10.4% female). The highest contributions being in Northern and Muchinga with 10% positivity yield in both Provinces and Luapula with 8%. The testing modality that contributed to this positivity rate was index testing.

Baseline Viral load were conducted on 1682 clients. Overall, 719 (43%) were virally suppressed.

Baseline Viral suppression was high in Northern province at 60%, flowed by Luapula province at 38% and Muchinga province at 34%. The baseline VL Suppression increased by age, with VL Suppression of 48% among the 30+ years old. By age disaggregation, the baseline Viral suppressions was 45% and 41% for the males and females respectively.

Conclusion

More females are testing for HIV as compared to males; however, positivity rate is high among males in the older age group 30 and above. The high viral suppression rates among the older age groups correlates with high positivity rates among this age group, the high positivity rates could be due to people testing while on treatment. The high positivity rate is due to clients testing while on treatment. We therefore recommend recency testing at baseline and possibly qualitative studies to understand why such high numbers of people test for HIV even when they know they are HIV+ and are already on ART

104. USE OF TECHNOLOGY TO BUILD SERVICE PROVIDER' CAPACITY AND PROGRAM PERFORMANCE. "CASE OF THE USAID ACTION HIV KNOWLEDGE CAFE"

Best Practices Abstract (Oral)

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Introduction

The Ministry of Health (MOH) set up Project Echo (Extension for Community Healthcare Outcomes) It is a tele-mentoring service dedicated to sharing knowledge and amplifying the capacity of health workers to provide best practice for underserved people particularly in rural communities.

RTCZ set up an ECHO approach in the DSD provinces of Muchinga, Luapula and Northern.

To facilitate the setup of ECHO in DSD two RTCZ staff participated in the ECHO Immersion training in Maputo Mozambique from 2nd to 5th November 2019. They were accompanied by a three-member team from the provinces—the PHD, Provincial Public Health Specialist or Provincial Clinical Care Specialist and Health Information/IT Officer.

The RTCZ-MOH team worked together to mentor district and facility staff through ECHO mechanism which strengthened the collaboration to support the MOH twin HIV and TB epidemic as well as cervical cancer programme.

RTCZ set up Situation rooms in Mansa, Kasama and Muchinga as well as in each respective hub. To facilitate ECHO training, RTCZ procured and set up IT equipment initially in 11 districts in each of three provinces. Key staff were trained in the four pillars (Amplification, Best practice, Case based learning and Data based learning) for a tele-mentorship to qualify for ECHO.

Methods

Building on the innovative ideas that RTCZ has developed to deliver quality health services, the Knowledge Café platform was introduced in all the 3 Provinces. The goal was to increase knowledge not only among staff but clients, by providing access to learning material beyond the ECHO platform which is not accessible in all sites. The strategy has been delivered through interactive learning sessions and sharing of developed Audio-visual learning material focusing on various topics around the 95-95-95 UNAIDS objectives. The topics delivered address both gaps and successes, with the goal of mitigating gaps and sharing best practices from the success recorded.

At baseline, the gaps identified included low elicitation ratios in index testing services, resulting in low performance across the index cascade. A video was developed on the correct process of elicitation and shared with the Counselors in the 3 Provinces. In addition, overall pediatric performance was low. Sessions were shared on the KYCS+ strategy using the Knowledge Café platform, and online tools developed for real time performance monitoring.

Results

Overall elicitation ratio increased from 1:1 to 1: 3, Index testing volume by 35% in quarter 2 and 59% in quarter 3. Pediatric performance across various indicators was at an upward trajectory; Case finding increased 77% in quarter 2 and 98% in quarter 3, while the positive cases increased by 35% between quarters 1 and 2. The overall number of new clients identified also increased by 23% in quarter 2 and 16% in quarter 3 with mastery of elicitation skills by the Counselors.

Conclusion

Overall performance improved over time as each topic addressed various gaps and the Knowledge café provided a platform to develop strategies to mitigate the gaps. We recommend learning events and development of visual materials as a means of improving performance and skills enhancement. With the slow growth of the pediatric Tx_Curr, the next steps include devising retention topics focused on various strategies to maintain pediatric clients in care—based on the terrain and analyze the reasons for missing appointments to inform the development of ART retention strategies, with the inclusion of the beneficiary.

HARNESSING THE POWER OF PUBLIC-PRIVATE-PARTNERSHIPS (PPPS) IN HEALTH SYSTEMS DURING PANDEMICS.

105. ENHANCING HEALTH INFORMATION EDUCATION AND COMMUNICATION AMIDST COVID-19 IN MAZABUKA DISTRICT

Best Practices Abstract (Oral)

Chilapala, P.[1], Ntutuma, D.[1], Simusokwe, R.[1], Mwamba, S.[1], and Mwaba, P.[1]

[1] Mazabuka District Health Office

Introduction

The government of Zambia, social organisations and health agencies, have extensively used Information Education Communication (IEC) as an integral medium for social change and development. The enhancement of IEC has become an effective medium for bringing awareness, providing information, eradicating mythical beliefs, and championing health. IEC is aimed at instilling positive information for appropriate behaviour in the community which promotes preventive health measures and development. IEC is a powerful tool which aims at changing, reinforcing or enhancing a set of behavior among a targeted audience regarding specific identified problem. A total of 144 radio slots and 48 TV slots were set as targets for 2021 to sensitize the community on the prevailing diseases of public health importance. However, the dissemination of health information through Television (TV) and Radio programs was low in Mazabuka district.

Aim:

To determine the root cause of low Health information dissemination and implement strategies to improve the dissemination of health information from 31% (60 TV & Radio programs combined) as of December 2021 to 100% (192 TV & Radio programs combined - Target) by December 2022.

Method

This was an interventional study conducted in Mazabuka district. A retrospective audit and root cause analysis was conducted to assess number of information disseminated programs prior to the month of January 2022 (pre-implementation). An intervention model was developed based on the root cause analysis and implemented from January 2022 to June 2022 (post-implementation). Descriptive statistics were used using excel.

Results

TV and radio programs were the main variables used in this quality improvement, however focus groups and door to door programs were also being implemented. The target for 2021 was also adopted

for 2022. The results for 2021 and 2022 were compared. The results show that the district recorded total of 30 TV & Radio programs combined (16% against target) information dissemination as of June 2021 (pre-implementation) as compared to 93 TV & Radio programs combined (48% against target) as of June 2022 (post-implementation) representing an improvement of 32% after the intervention.

Conclusion

As shown in the results, good planning and consistency in attending the scheduled TV and radio sessions is key in disseminating information on health matters to the community thereby reducing the disease burden as seen with the overwhelming response to the COVID-19 vaccinations. Stakeholder (media houses) engagement or partnership was also crucial in achieving these results. It is therefore recommended that districts should strengthen relations or partnership with media houses in order to get free slots and avoid cost implications. It is also recommended that a panelist schedule is put up and scripts shared with journalists to familiarize themselves with the topic prior to the set date. It is further recommended that a week's notification be sent to the participants attending the sessions.

106. PRIVATE SECTOR INVOLVEMENT IN IMPLEMENTING MALARIA ELIMINATION INTERVENTIONS IN ZAMBIA

SCIENTIFIC ABSTRACT (Oral)

Chama-Chiliba, M.C.[1], Mukanu, M.[2], Kangale, C.[3], Phiri-Chibawe, C.[3], Somtore J.[4], and Mwase, I.[4]

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[4] *USAID.*

Introduction

Malaria elimination remains one of the public health priorities of the Government of the Republic of Zambia. Whereas the private sector players are essential in providing health services as they invest financial and non-financial resources, their role in malaria elimination is unclear. This study examines the coverage, approach, investments and lessons learned in private sector implementation of malaria elimination programs in Zambia. In addition, the study highlights the type of interventions they are

involved in, the level of financial, technical, and human resources investments in those malaria programs, and makes recommendations for effective leveraging and coordination of multi-sector involvement in malaria programs. The study also highlights the complementary role played by the private sector involvement during the COVID-19 pandemic.

Methods

The study uses a mixed-method approach, covering the 10 provinces in Zambia. Data was collected using a semi-structured questionnaire and key informant interview guides from representatives of private sector companies and beneficiaries, government representatives and cooperating partners at the national and sub- national levels. Of the 132 private sector companies sampled, responses were obtained from 95 companies (72%) of which 69 (73%) had provided financial or non-financial support towards the malaria elimination programme. A total of 33 participants, including national and subnational government officers, representatives from private sector organisations and cooperating partners were interviewed.

Results

Nominal private sector expenditure on malaria elimination activities increased from ZMW 15.1 million in 2018 to ZMW 23.2 million in 2020. From 2018 to 2020 the three main categories of private sector malaria related expenditure were on case management, vector control and health system strengthening. Most (59%) of the surveyed companies contribute to malaria programs through corporate social responsibility (CSR) activities, followed by those motivated to manage employee welfare at 39%. The overall private sector investment in malaria elimination activities is about 1% of the estimated cost of malaria interventions in the National Malaria Elimination Strategic Plan 2017-2021. The proportion of private sector firms involved in malaria programs was highest in Copperbelt at 29% and lowest in both Northern and North Western provinces at 3%. Although the private sector is included in government planning and budgeting through the National Malaria Elimination Programme, there are some gaps, particularly at sub-national level, which lead to uncoordinated implementation of work plans and delays or non-implementation of planned activities.

Conclusion

Private sector investment in malaria elimination activities has consistently complemented government funding even during the time of the COVID-19 pandemic, albeit at a relatively small scale. There is

opportunity for the Ministry of Health to leverage private firms' willingness to support interventions as part of their CSR and their investments in employee welfare. The tracking of private-sector financial and non-financial investments in health, including malaria, is critical for effective planning and policy making.

107. MONITORING SPECIES DIVERSITY, ABUNDANCE, COMPOSITION AND PARASITE INFECTIONS OF ANOPHELES MOSQUITOES IN A MALARIA-ENDEMIC AREA OF LUAMPA DISTRICT, WESTERN PROVINCE, ZAMBIA

Scientific Abstract (Poster)

Simubali, L.[1], Stevenson, J.[1], Matoba, J.[1], Mungo, A.[1], Chisanga, M.[1], Wagman, J.[2], Chanda, B.[3], Kaniki, T.[3], Muyaba, R.[3], Miller, J.[3], and Chanda, J[3].

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[2] PATH, Seattle WA, USA,

[3] PATH, Lusaka, Zambia,

Introduction

Long-lasting insecticidal nets (LLINs) and indoor residual spraying (IRS) are the main malaria vector control methods in Zambia. Despite scaling-up LLINs and IRS in Luampa District of western Zambia, malaria transmission persists, posing a serious public health challenge. The Zambia National Malaria Elimination Programme is carrying out operational research studies to evaluate next-generation vector control tools to aid in achieving malaria elimination. One of the potential additional tools being evaluated is the use of attractive sugar baits (ASBs). Additionally, enhanced entomological surveillance is required to provide data that will guide selection of effective and sustainable vector control strategies in western Zambia. This study monitored species diversity, relative abundance, species composition and parasite infection of Anopheles mosquitoes in Luampa District, Western Province of Zambia.

Methods

Entomological cross-sectional surveys were conducted from March to May 2020 in Katongo village of Luampa District (lies between latitude 15.0633°S and longitude 24.4077°E) in Western Province of

Zambia. Four cross-sectional entomological surveys were carried out; one pre-collection period in which mosquitoes were sampled for 15 nights and three post-collection periods which lasted for 45 nights (i.e. each round with 15 nights). Different collection methods were used to sample the mosquitoes including indoor and outdoor CDC light traps, indoor prokopack aspiration and outdoor clay pots. Sub-samples of An. gambiae s.I and An. funestus s.l were randomly selected for Plasmodium falciparum sporozoite detection using Enzyme-Linked Immunosorbent Assay (ELISA) while polymerase chain reaction (PCR) was used for sibling-species identification.

Results

A total of 60 nights of mosquito trapping was conducted with a total of 4,018 adult anopheline mosquitoes belonging to thirteen species were collected during pre- and post-collection period. The most abundant species was An. squamosus accounting for 53.7 % (n=2,156) with the least being An. rufipes 0.02% (n=1)

Out of 4,018 anopheline mosquitoes, 783 anopheles belonging to An. gambiae s.I and An. funestus s.I complexes were further analyzed by PCR technique. Three species of the An. gambiae s.I complex were identified; An. gambiae s.s (29%, n=185), An. arabiensis (18.8%, n=118) and An. quadriannulatus (0.8%, n=5), and only two species belonging to An. funestus s.I complex were identified; An. funestus s.s (40.3%, n=62) and An. leesoni (1.9%, n=3) in the study area. Out of the total, 2,039 anopheline mosquitoes were screened for Plasmodium falciparum (Pf) and 14 positives were detected giving a mean P.f sporozoite infection rate of 0.7% (n=14/2039). None of the secondary vectors tested positive for P. falciparum sporozoites.

Conclusion

The identification of thirteen species of anopheline mosquitoes in the study area of Luampa District highlights high species diversity which might pose a challenge for malaria control and elimination efforts in western Zambia. Anopheles gambiae s.s and An. arabiensis are the main vectors of malaria in the study area. Longitudinal studies focusing on the seasonality, ecology, and biology of potential secondary vectors of malaria will be critical in the selection, design and implementation of sustainable vector strategies in western Zambia.

OTHERS (INCLUDING OTHER PUBLIC HEALTH THREATS)

108. EFFICACY, SAFETY AND TOLERABILITY OF PYRONARIDINE-ARTESUNATE IN ASYMPTOMATIC MALARIA-INFECTED INDIVIDUALS: A RANDOMIZED CONTROLLED TRIAL

Scientific Abstract (Oral)

Hachizovu, S.[1], Dabira, E.D.[2], Conteh, B.[2], Mendy, A.[2], Nyang, H.[2], Lawa, B.[2], Ndiath, M.O.[2], Mulenga, J.M.[1], Mwanza, S.[1],Borghini-Fuhrer, I.[3],Arbe-Barnes, S.[4], Miller, R.[4], Shin, J.[5],Duparc, S.[3],D'Alessandro, U.[2], Achan, J.[2], and Manyando, C.[1]

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Introduction

A major challenge for malaria elimination is transmission from asymptomatic malaria-infected individuals carrying low-density infections. Interventions targeting the human transmission reservoir, such as mass drug administration (MDA), can reduce malaria prevalence and transmission. Effective MDA requires high coverage, good adherence to an efficacious, well-tolerated and affordable treatment for this purpose. *Pyronaridine-artesunate (PA)* is a fixed-dose artemisinin based combination therapy (ACT) shown to be highly efficacious and well tolerated for the treatment of uncomplicated *plasmodium falciparum* malaria. A study was done to evaluate PA efficacy, safety, and tolerability in individuals with asymptomatic *Plasmodium falciparum* infection. The study was set out to assess the efficacy of *Pyronaridine-artesunate* administered for three, two and one day by measuring polymerase chain reaction (PCR)-adjusted adequate parasitological response (APR) at Day 28 in asymptomatic *P. falciparum* carriers

Methods

This was a phase II, multi-center, open label, randomized clinical trial conducted in The Gambia and Zambia (Nchelenge) between October 2018 and May 2019. Male and female asymptomatic participants aged above 5 years and weighing above 20 kg were -pre-screened with a hyper-sensitive Rapid Diagnostic Test (HS-RDT) for detection of *P. falciparum malaria* after signing a pre-screening informed consent/assent. Individuals with a positive pre-screening HS-RDT and confirmatory blood smear had the study further explained and those interested in study participation were required to sign a Study Specific Informed Consent / Assent detailing all study procedures. Those who met the inclusion criteria and none of the exclusion criteria were enrolled and randomized 1:1:1 to receive treatment with Pyramax orally for 3 days, 2 days or 1 day (Treatment Arms A, B and C, respectively) and followed up for 63 days. Screen failures were offered local standard of care treatment. Blood samples were collected on Days 0, 1, 2, 3, 7, 14, 21, 28, 35, 42 and 63 for malaria diagnostics, assessment of parasite density and qPCR analysis. The primary efficacy outcome was PCR-adjusted APR at day 28 in the per-protocol population.

Results

303 participants were randomized. Day 28 PCR-adjusted APR was 100% for both the 3-day (98/98) and 2-day regimens (96/96), and 96.8% (89/94) for the 1-day regimen. Efficacy was maintained at 100% until day 63 for the 3-day and 2-day regimens but declined to 94.4% (84/89) with the 1-day regimen. Adverse event frequency was similar between the 3-day (51.5% [52/101]), 2-day (52.5% [52/99]), and 1-day (54.4% [56/103]) regimens; the majority of adverse events were of grade 1 or 2 severity (85% [136/160]). Only 2 Serious Adverse Events were reported.

Conclusions

Pyramax administered over 1, 2 or 3 days was well tolerated, with no new safety concerns. It was highly efficacious in clearing initial parasitemia in carriers and in preventing new infections up to 63 days post first dose. Overall, in this population the efficacy of 2-day treatment regimen was similar to that of standard treatment of 3-days. However, the efficacy for the 1-day treatment regimen was less than that of the standard 3-day dosing regimen. These data are very informative for MDA strategies which Zambia is considering in pursuit of malaria elimination.

109. EPIDEMIOLOGY OF SEVERE AND NON-SEVERE MALARIA IN CHILDREN: PROTOCOL REVIEW OF A PROSPECTIVE OBSERVATIONAL STUDY.

Scientific Abstract (Poster)

Gwasupika, J.[1], Chaponda, M. [1,2], and Maitland, K.[3,4]

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[2] London School of Hygiene and Tropical Medicine.

[3] Imperial College London.

[4] Kenya Medical Research Institute-Wellcome Trust

Introduction

Malaria remains the commonest cause of morbidity and mortality in sub-Saharan African children under the age of 5, despite the many control measures over the years. Although, there has been a reduction in malaria incidence over the past 2 decades, some studies have noted that this is not a universal phenomenon. Hospital admissions due to malaria have increasingly shown a change in disease pattern and age phenotype. This study aims to compare characteristics of admitted children, incidence of post discharge events of all cause readmissions and cause of mortality and time from presentation to hospital gate way among children with severe malaria and non-severe malaria.

Methods

This is a prospective multicentre observational study currently running in 5 country sites, Zambia inclusive. All children aged 3 months to 15 years with a positive malaria RDT at admission and whose caregivers have consented to take part in the study, are recruited and followed up to day 180. Children meeting the WHO or Taule severity criteria at admission are recruited as cases and those not meeting severity criteria as controls. Screening of children for study eligibility is being done using a structured case report form. Entry of data into REDCap is done by two independent personnel and merged by a data manager. Continuous factors will be compared between cases and controls using means and standard deviation or median and interquartile range for skewed data. Categorical data will be compared using chi-squared or Fisher's exact tests. Time to event outcomes will be analysed and

compared between malaria cases and controls using Kaplan Meier and cox proportional hazards. Incidence of readmissions and potential malaria episodes will be summarised using all events as incidence per 100 child years.

Ethical approval was obtained from Tropical diseases research centre ethics committee (TDRC-EC) and national health research authority (NHRA).

Results

It is expected that children admitted with severe malaria will also have bacterial co-Infection which may be associated with a higher mortality than children with non-severe malaria. On the other hand, children admitted with severe diseases will likely be admitted later post initial admission for malaria. However, the majority of patients with severe and uncomplicated malaria will be under the age of 5.

Conclusion

Findings from this study will inform policy on the treatment of severe malaria patients by addition of an antibiotic in view of a possible bacterial co-infection. Also delay in the treatment of malaria and health seeking behaviour will be addressed as it is the main driver of increased parasitemia and worsening of disease progression thus leading to high morbidity and mortality.

110. INCIDENCE AND RISK FACTORS ASSOCIATED WITH ENTEROTOXIGENIC E. COLI DIARRHOEAL DISEASE IN CHILDREN UNDER 3 YEARS OLD IN LUSAKA, ZAMBIA.

Scientific Abstract (Poster)

Kabuya, J.B.[1], Thuma, E.P.[2], Shapiro, A.T.[1], Moss, J.M.[1], and Ippolito, M.M.[1]

[1] Tropical Diseases Research Centre

[2] John Hopkins School of Medicine,

Introduction

Enterotoxigenic *E. coli* (ETEC) is the third commonest cause of moderate to severe diarrhoea in children under 5 years in the developing world after rotavirus and *Cryptosporidium*. In a study by

Chisenga et., al (2016) which analysed 1135 stool samples from children under five (5) presenting with MSD at local health facilities in Lusaka, ETEC was found to be one of the top 5 enteric pathogens detected with a prevalence of 40.7%. Given the advance of ETVAX® in the development pipeline, it is important to determine the incidence of ETEC in this population to help determine population at risk for both efficacy and effectiveness studies. While the estimated prevalence of ETEC is known in Zambia, the incidence is not known. We aimed to determine the incidence of Moderate to Severe diarrhoea (MSD) with confirmed *ETEC* aetiology and the risk factors associated with ETEC diarrhoea in children under 3 years old in Zambia.

Methods

Design: This was a two-stage prospective observational study in which 6828 children below 3 years were recruited from 5 peri-urban communities in Lusaka via a census and then followed up for 12 months. In Stage one, a household census was, conducted in the catchment areas for the respective health facilities to establish the population at risk. Thereafter, a surveillance passive system for diarrhoea case detection was set up at the health facilities located within each community.

Clinical and demographic data: Demographic data for each child was collected during census and clinical data for severity determination was collected at health facility when the child presented there with diarrhoea.

Sample collection and processing: Stool samples were collected from health facilities and were immediately cultured, while an aliquoted was stored for future etiologic testing

Sample testing: The samples we cultured on MacConkey media overnight, lactose fermenting colonies were sub cultured and the pure colonies subjected to biochemical tests and then all *E.coli* positive ones were the run on colony PCR targeting ETEC toxin genes(i.e., LT, STh and STp)

Statistical analysis: Incidence was calculated using STATA statistical software package (version 17.0) (StataCorp LP, College Station,TX, USA and hazard ratios computed to determine risk factors associated with ETEC specific diarrhoea.

Results

A total of 1100 children presented to the health facility with diarrhoea, out of which 144(10.4%) tested positive for ETEC. The overall incidence rate was 30 cases per 1000 child years (95% CI 2.63 -3.65). One significant risk factor for ETEC diarrhoea was age 1-2 years (hazard ratio [HR], 95% CI 1.1 - 2.29) while Mother's level of education (i.e., senior secondary school education or higher) was a significant protective factor (HR 0.65, CI 0.44- 0.97).

Conclusion

There is a high incidence and burden of ETEC specific diarrhoea in the population studied with children between the ages of 1-2 being the most at risk. Given the debilitating effects of diarrhoea on children and the associated sequalae, an effective vaccine targeting children between 1-2 years would be of great public health value in this setting.

111. AN FUNESTUS S.S EMERGENCE AND IT'S THREAT TO MALARIA ELIMINATION EFFORTS IN NDOLA DISTRICT, COPPERBELT PROVINCE OF ZAMBIA.

Scientific Abstract (Poster)

Hamwata, W.[1], Muleba, M.[1], and Shimaponda-Mataa, N.M.[2]

[1] Tropical Diseases Research Centre,

[2] University of Zambia

Introduction

The primary malaria vectors in Zambia are *An. funestus* and *An. gambiae* complexes[1]. *An. funestus s.s* is predominant malaria vector in 8 of the 10 provinces of Zambia. *An gambiae s.s* and *An arabiensis* are the predominant malaria vectors on the Copperbelt and Southern Province respectively [2]. However, implementation of vector control activities could lead to a shift in the abundance and distribution of malaria vectors over time[3–6]. As such, this study assessed the abundance and distribution of malaria vectors in Ndola, Zambia during the dry season.

Methods

Mosquito collection was done using CDC-LT, PSC, Aspiration and larval collection from a total of 225 collection efforts. The study was conducted in 4 sites Musalu (urban, high density, gardening activities); Mapalo (urban, medium density); Kamalasha (rural, high density, farming activities). Mosquitoes collected were morphologically identified and determination of the sibling species was done using multiplex PCR[7–9].

Results

A total of 737 malaria vectors were collected. *An gambiae s.s* (83%) was the most abundant malaria vector and *An funestus s.s* was 17% of the Collections. All the four sites had the two primary vectors. From Kamalasha and Pima over 70% of the vectors were *An funestus s.s.* Further, 90% of the malaria vectors collected from Musalu were *An gambiae s.s* whereas 65% of the malaria vectors from Mapalo were *An funestus s.s.*

Conclusions

All *An funestus s.l* and *An gambiae s.l* were molecular identified as *An funestus s.s* and *An gambiae s.s* respectively. *An gambiae s.s* is the most abundant malaria vector but *An funestus s.s* was predominant in three of the four sites sampled. The emergence of *An funestus s.s* pose a threat of sustaining malaria transmission in both the wet seasons and dry seasons (when *An gambiae s.s* densities are low) in Ndola District.

112. VOLUNTARY MEDICAL MALE CIRCUMCISION TRANSITION ASSESSMENT DASHBOARD (VTAD); A PRACTICAL APPROACH TO MEASURING PROGRAM SUSTAINABILITY.

Best Practices Abstract (Oral)

Silondwa, M.[1], Longwe-Ng'andwe, B.[1], Chilembo, M.[1], Mwamba, T.[1], Haimbe, P.[1], Kanyenda, T. [1], Kamboyi, R[2].

[1] Clinton Health Access Initiative,

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Introduction

The voluntary medical male circumcision (VMMC) programme in Zambia was launched in 2009 following a recommendation by the World Health Organization. The programme has had significant success in scaling up services, with over 3 million men circumcised to date. VMMC was originally a vertical programme mainly supported by implementing partners, over time the programme has transitioned to a routinized HIV prevention intervention that is embedded into other primary health services. To measure this transition to a sustainable health programme, the Clinton Health Access Initiative (CHAI) with support from the MOH developed and launched the VMMC Transition Assessment Dashboard (VTAD). The VTAD is a locally developed assessment tool that measures progress towards six country-defined sustainability goals across programme pillars namely; leadership, advocacy, governance & coordination, service delivery, communication & demand generation, resource mobilization, monitoring & evaluation, and supply chain. The abstract will demonstrate the utility of the VTAD in measuring programme sustainability.

Methods

Using convenience sampling, programme implementation data was collected from 40 districts across the 10 provinces of Zambia. This data was obtained through focus group discussions with members of provincial and district health teams such as health directors, pharmacists, VMMC coordinators, and health education officers. Excel workbooks and Google docs were used to record and collect the scores from preset questions. The data collected (scores) from the assessments were uploaded into a visual dashboard in Tableau online.

Results

Two phases of the VTAD have been completed: the baseline VTAD in 2019 and the second phase in 2021. All the six pillars recorded an improvement in the second phase. Between Phase I and Phase II, progress towards sustainability was documented, with 15 districts progressing from mid to a mature state. The VTAD exercise identified key enablers and barriers to sustainability progress. Key enablers included: routinized service delivery models that supported programme sustainability and MOH policy change requiring centralized VMMC commodity procurement, improving product visibility. Barriers to sustainability included: a lack of decentralization of training and other opportunities for VMMC

providers and exclusion of VMMC in the MOH Performance Assessment tool which has led to limited opportunities to identify programme gaps.

Conclusion

The VTAD highlighted transition-specific changes and identified enablers and barriers across the VMMC programme pillars. This study has demonstrated that programs can develop context-specific measurement tools with concrete milestones to track progress towards programme sustainability. This tool can be adapted to support sustainable programme planning for other HIV prevention programs.

113. ASSESSING THE POTENTIAL EFFECT OF TRADITIONAL FERMENTED FOODS ON THE GUT MICROBIOTA METABOLISM USING AN IN-VITRO SINGLE BATCH CULTURE SYSTEM

Scientific Abstract (Oral)

Chileshe, J.[1], Sikalima, J.[1], Malunga, P.[1], Handema, R.[1], Zwaan, B.[2], Talsma, E.[2] and Schoustra, S.E.[2]

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[2] Wageningen University

Introduction

The microbial composition of the human gut differs between healthy and less-healthy individuals and can be said to influence human health. The human gut microbiota is affected by diet, with fermented foods having been found beneficial in modulating the gut microbiota. Several foods naturally contain lactic acid bacteria that could have probiotic effects this can be attributed to traditionally fermented food products that contain a microbial community consisting of a variety of lactic acid bacteria. The study was set out to determine differences in concentrations of Short Chain Fatty Acids (SCFAs) as an indicator of beneficial bacterial activity when exposing the microbes in the stool samples to Mabisi or Munkoyo and to determine if exposure of stool microbiota to Mabisi and Munkoyo shifts the levels of the indicator beneficial bacterium Lactobacillus.

Methods

This was a laboratory based in-vitro experiment. Stool samples were obtained from 3 adults (1 Female and 2 Males) residing in Ndola between the ages of 20 and 30 years old in 2018 who had not been treated with antibiotics in the 6 months prior to the study. An in-vitro single-batch culture fermentation system was used to study probiotic effects of traditional fermented products Mabisi and Munkoyo. Stool samples were exposed to these products and various controls. Concentrations of short chain fatty acids were measured using HPLC machine and used these as an indicator of beneficial bacteria activity. Shifts in levels of the beneficial bacterium Lactobacillus were measured by qPCR using SYBR green on the ABS Fast 7500 Real-Time PCR machine. Ethics approval was obtained from the TDRC Ethics review committee.

Results

It was shown that exposure to any of the fermented foods results in higher levels of SCFAs and also higher levels of Lactobacillus.

Conclusion

These results support the idea that consumption of fermented foods can result in healthier metabolism of the gut microbiota as measured with SCFA concentrations. These results can inform further more complex in-vitro as well as in-vivo studies on the effects of the traditional fermented foods on gut microbiota metabolism and composition. During pandemics or under restrictions, innovations such as in-vitro experiments can be used to generate important data without necessarily involving big numbers of human subjects.

114. A HYBRID OF SCREEN-AND-TREAT AND INTERMITTENT PREVENTIVE THERAPY FOR THE PREVENTION OF MALARIA IN PREGNANCY: A RANDOMIZED CONTROLLED TRIAL

Scientific Abstract (Poster)

Kabuya, J.B.[1], Ippolito, M.[2], Nambozi, M.[1], Chongwe, G.[1], and Manyando, C.[1]

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Introduction

Despite the increase in Plasmodium falciparum resistance to sulfadoxine-pyrimethamine (SP), intermittent preventive treatment in pregnancy with SP (IPTp-SP) remains the only recommended chemoprevention for malaria in pregnancy (MIP). Alternative chemopreventive strategies are urgently needed. We conducted a phase IIIb open-label, two-armed randomized controlled superiority trial to assess the safety and efficacy of an IPTp approach that incorporates screening with rapid diagnostic test (RDT) and treatment with dihydroartemisinin-piperaquine (DP) at the first antennal care (ANC) visit.

Methods

The study was conducted in Nchelenge District, Luapula Province, Zambia. 392 HIV-negative pregnant women without signs or symptoms of malaria out of 850 screened were recruited and randomized to either standard IPTp-SP or hybrid IPTp-SP plus screening and treatment (IPTp-SP+). In the IPTp-SP+ arm, participants who screened positive by RDT were treated with DP at the first ANC visit while those who screened negative received SP. Participants in the control arm were administered IPTp-SP per current guidelines. All received SP on days 35 and 63. Participants were followed biweekly up to day 63 and then monthly until delivery. Infants were followed until 1 year after delivery. The primary endpoint was incident PCR-confirmed MIP at day 42. Secondary endpoints included incident MIP at other time points, placental malaria determined from histology of placental biopsies, congenital malaria determined from cord blood smears, hemoglobin trends, birth outcomes, and incidence of adverse events in infants. The last infant follow-up visit was completed July 2021 and data analysis is underway.

Conclusion

This trial assesses the safety and efficacy of a hybrid approach combining standard IPTp-SP with screening and treatment using DP at the first ANC visit. Over 50% of P. falciparum infections diagnosed during pregnancy can be detected at the first ANC visit, and higher density infections that occur early in gestation may pose the most harm, therefore focusing on detection and treatment at the first ANC visit may improve birth outcomes in a cost-effective manner.

115. DIHYDROARTEMISININ-PIPERAQUINE IS ASSOCIATED WITH HIGHER POST-TREATMENT GAMETOCYTEMIA RELATIVE TO ARTEMETHER-LUMEFANTRINE: PRELIMINARY RESULTS OF A PHARMACODYNAMIC STUDY

Scientific Abstract (Poster)

Kabuya, J.B.[1], Thuma, E.P.[2], Shapiro, A.T.[3], Moss, J.M.[2], and Ippolito, M.M.[3]

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Introduction

Mass drug administration (MDA) for the elimination of *Plasmodium falciparum* malaria remains a controversial practice. Currently, the favored agent for MDA is dihydroartemisinin-piperaquine (DP) due to the relatively long elimination half-life ($t_{1/2}$) of the non-artemisinin partner and its relegation in most endemic areas of sub-Saharan Africa as a second-line therapy to the more widely used artemether-lumefantrine (AL).

Methods

We conducted a phase II/III randomized controlled trial of AL and DP to assess their relative anti-gametocyte and secondary chemopreventive efficacies to elicit information relevant to their deployment in different contexts, including in MDA. The trial was conducted in Nchelenge District, Luapula Province, a high-transmission area of rural Zambia. Children younger than 5 (n=182) with uncomplicated falciparum malaria were randomized to AL or DP, admitted for a 72-hour period for parasite and drug kinetics, and followed for 9 weeks.

Results

A total of 173 participants (95%) contributed 1,424 person-weeks of observation time. Asexual parasite clearance did not differ between the groups (parasite clearance 3.1 ± 1.2 h *vs.* 2.7 ± 1.3 h in the AL *vs.* DP group, p=0.35) but gametocyte clearance was more rapid and durable in the AL group. In participants who had gametocytes at baseline, all of those treated with AL (n=8) were clear of gametocytes by 1 week after the start of treatment (i.e., 4-5 days after the last dose) compared to 5 of

8 (62%) of those treated with DP (p=0.04). Gametocyte density measured as the area under the gametocyte concentration-time curve was significantly lower in the AL group ($AUC_{0\text{-}63d}$ 38 gametocytes × h/mL (95% CI 13-107) *vs.* 136 (95% CI 34-550) in the DP group, p<0.001). Gametocyte carriage was significantly lower in the AL group after treatment at 2 weeks (relative risk (RR) 0.50, 95% CI 0.25-0.98, p=0.03) and remained lower at 9 weeks (RR 0.50, 95% CI 0.26-0.93, p=0.02). Further, those treated with DP had a higher likelihood of developing emergent gametocytemia during the 9-week follow-up period. The overall incidence of recurrent asexual parasitemia was higher in the AL group compared to the DP group (hazard ratio 1.9, 95% CI 1.3-2.7, p=0.001) but by week 9 there was no statistically significant difference in the cumulative prevalence of recurrent parasitemia (AL 58% *vs.* DP 49%, p=0.31) or clinical failure, defined as recurrent parasitemia with fever (AL 19% *vs.* 18%, p=0.89). These results suggest that the more efficient, durable anti-gametocyte activity of AL compared to DP supersedes the limited post-treatment chemoprotective benefit of DP in terms of projected utility in MDA campaigns.

Conclusion

MDA is typically pursued in low-transmission settings where blocking gametocyte-mediated transmission to achieve elimination is a higher priority than preventing recurrent parasitemia in individuals already at low risk of reinfection. An important tenet of MDA is to avoid first-line agents so as not to subject them to emergent drug resistance. Reversing the roles of AL and DP in sub-Saharan Africa as first- and second-line agents, or reformulating alternative agents that share similar properties, could offer a next step toward optimizing antimalarial drugs for malaria control and elimination.

116. THROMBOCYTOPENIA PREDICTS TRANSFUSION RESPONSE IN CHILDREN WITH SEVERE MALARIAL ANEMIA.

Scientific Abstract (Oral)

Ippolito, M.M.[1,2,3], Kabuya, J.B.[4], Hauser, M.[5,6], Kamavu, L.K.[7], Banda, P.M.[7], Yanek, L.R.[1], Malik, R.[8], Mulenga, M.[9], Bailey, J.A.[10], Chongwe, G.[4], Louis, T.A.[11], Shapiro, T.A.[1,2,3], Moss, W.J.[2,12] for Southern and Central Africa International Centers of Excellence for Malaria Research

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Introduction

Severe malaria resulting from Plasmodium falciparum infection is the leading parasitic cause of death in children worldwide, and severe malarial anaemia (SMA) is the most common clinical presentation. The evidence in support of current blood transfusion guidelines for patients with SMA is limited.

Methods

We conducted a retrospective cohort study of 911 hospitalized children with SMA in a holoendemic region of Zambia in Nchelenge district to examine the association of whole blood transfusion with in-hospital survival. Data were extracted from pediatric ward registers and laboratory. logbooks across dates for which all data sources were available. These were inclusive of March–December 2012 and January 2014–June 2019. Data were analysed in adjusted logistic regression models using multiple imputation for missing data.

Results

The median age of patients was 24 months (interquartile range, 16–30) and overall case fatality was 16%. Blood transfusion was associated with 35% reduced odds of death in children with SMA (odds ratio, 0.65; 95% confidence interval, .52–.81; P=.0002) corresponding to a number-needed-to-treat (NNT) of 14 patients. Children with SMA complicated by thrombocytopenia were more likely to benefit from transfusion than those without thrombocytopenia (NNT=5). Longer storage time of whole blood was negatively associated with survival and with the posttransfusion rise in the platelet count but was not associated with the posttransfusion change in haemoglobin concentration.

Conclusions

Whole blood given to paediatric patients with SMA was associated with improved survival, mainly among those with thrombocytopenia who received whole blood stored for 4 weeks. These findings point to a potential use for incorporating thrombocytopenia into clinical decision making and management of severe malaria, which can be further assessed in prospective studies, and underline the importance of maintaining reliable blood donation networks in areas of high malaria transmission.

117. SHORTER TREATMENT FOR MINIMAL TB IN CHILDREN: MAIN FINDINGS FROM THE SHINE TRIAL

Scientific Abstract (Oral)

Chabala, C.[1], Turkova, A.[2], Thomason, M.J.[2], Wobudeya, E.[3], Hissar, S. [4], Mave, V. [5], van der Zalm, M.[6], Palmer, M.[6], Kapasa, M.[7], Bhavani, P.K.[4], Balaji, S.[8], Raichur, P.A. [5], Demers, A.[6], Hoddinott, G.[6], Owen-Powell, E.[2], Kinikar, A.[5], Musoke, P.[3], Mulenga, V.[7], Aarnoutse, R.[9], McIlleron, H.[10], Hesseling, A.[6], Crook, A.M.[11], Cotton, M.[12], Gibb, D.M. [13], SHINE trial team

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Introduction

Two thirds of children with tuberculosis have non-severe disease, which may betreatable with a shorter regimen than the current 6-month regimen.

Methods

SHINE was an open-label treatment-shortening trial in children with minimal, symptomatic drug-sensitive TB, in 5 African (Zambia, Uganda, South Africa) and Indian sites. Children <16 years were randomised to 4 versus 6 months of treatment using WHO-recommended paediatric fixed-dose formulations (8 weeks isoniazid/rifampicin/pyrazinamide +/- ethambutol followed by either 8 or 16 weeks of isoniazid/rifampicin). Primary efficacy outcome was the proportion with unfavourable outcome (treatment failure or lost to follow-up on treatment, TB recurrence or death by 72 weeks). The study was powered on a key subgroup independently adjudicated to have TB at baseline (assumed to be 80%); the non-inferiority margin was 6%. Primary safety outcome was grade ≥3 adverse events occurring during treatment.

Results

From July 2016 through July 2018, a total of 1204 children underwent randomization (602 in each group). The median age of the participants was 3.5 years (range, 2 months to 15 years), 52% were male, 11% had human immunodeficiency virus infection, and 14% had bacteriologically confirmed

tuberculosis. Retention by 72 weeks was 95%, and adherence to the assigned treatment was 94%. A total of 16 participants (3%) in the 4-month group had a primary-outcome event, as compared with 18 (3%) in the 6-month group (adjusted difference, −0.4 percentage points; 95% confidence interval, −2.2 to 1.5). The noninferiority of 4 months of treatment was consistent across the intention-to-treat, per-protocol, and key secondary analyses, including when the analysis was restricted to the 958 participants (80%) independently adjudicated to have tuberculosis at baseline. A total of 95 participants (8%) had an adverse event of grade 3 or higher, including 15 adverse drug reactions (11 hepatic events, all but 2 of which occurred within the first 8 weeks, when the treatments were the same in the two groups).

Conclusion

Four-month treatment was as good as 6 months for drug-sensitive minimal TB in children and should be considered by TB programmes to reduce treatment burden on children, caregivers and the health service. Program implementation requires clear messaging for identifying children with minimal TB and consideration of the implementation requirements for the stratified approach to paediatric TB treatment.

118. SUBOPTIMAL LOPINAVIR EXPOSURE ON 8-HOURLY LPV/R 4:1 IN HIV/TB CO-INFECTED CHILDREN

Scientific Abstract (Oral)

Chabala, C.[1,2,4], Turkova, A.[3], Kapasa, M.[2], LeBeau, K.[3], Zimba, K.[2], Weisner, L.[4], Zyambo, K.[2], Choo, L.[3], Chungu, C.[2], Lungu, J.[2], Crook, A.[3], Mulenga, V.[2], Gibb, D.[3], and McIlleron, H.[4] on behalf of the SHINE trial team

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Introduction

Young children with HIV/TB co-infection have limited antiretroviral treatment (ART) options. Lopinavir/ritonavir 4:1 (LPV/r) is widely used for first- and second-line ART but lopinavir (LPV) exposures are profoundly reduced by concomitant rifampicin. Recommended super-boosted lopinavir (LPV/r 1:1) is not feasible, as single-entity ritonavir is not widely available. A previous study in 11 children showed that 8-hourly liquid LPV/r formulation co-administered with rifampicin achieved targeted trough concentrations of LPV ≥1 mg/L in nearly two-thirds of children, suggesting that higher LPV/r dosing could potentially be used. We evaluated increased 8-hourly LPV/r (4:1) doses in HIV/TB co-infected children in a substudy of the SHINE trial (ISRCTN 63579542).

Methods

HIV/TB co-infected Zambian children, weighing 3.0 to <20 kg, on LPV/r-based ART and rifampicin-containing TB treatment, received liquid LPV/r 4:1 formulation 8-hourly using weight band (WB) dosing 31-40 and 20-22 mg/kg in the lowest and highest WBs, respectively. Children were switched to WHO-recommended 12-hourly LPV/r 2 weeks after stopping rifampicin. LPV plasma concentrations were assessed on 8-hourly LPV/r and repeated 2 weeks after returning to 12-hourly dosing. Samples were obtained pre dose and post dose at 1, 2, 4, 6 and 8hr, as well as 12 hr on 12-hourly dosing.

Results

15 children (10[66%] males) with a median age of 3.0 (range 1.0 to 7.0) years were enrolled and received median LPV 23(range 21-37) mg/kg/dose.Plasma LPV exposures on 8-hourly LPV/r with rifampicin were lower compared to 12-hourly dosing (AUC24 GMR [90% CI] 0.35[0.21-0.61]) (Table). Only 7/15(44.7%) and 8/12(66.7%) children achieved LPV Cmin ≥1mg/L post dose trough concentrations (8hr and 12hr) with and without rifampicin respectively. During median 12 (IQR 4-16) weeks on 8-hourly LPV/r, 2 patients had 3 grade 3/4 adverse events (2 pneumonias, 1 urinary tract infection) deemed unrelated to the intervention; there were no treatment-related discontinuations.

Conclusion

LPV/r oral solution given in increased doses 8-hourly alongside rifampicin did not reach adequate LPV concentrations, and therefore unsuitable for HIV/TB co-infected children. The subtherapeutic

exposures observed after TB treatment raise questions about the bioavailability of LPV/r oral solution in this population and supports the rapid transition to dolutegravir-based ART.

119. EFFECT OF A FAMILY PLANNING/HIV PREVENTION PROGRAMME ON LONG-ACTING REVERSIBLE CONTRACEPTIVE (LARC) USE IN A COHORT OF HIV-NEGATIVE ZAMBIAN FEMALE SEX WORKERS.

Scientific Abstract (Oral)

Chopo, S.[1], Kabengele, C.[1], Malama, K.[1], Mwangelwa, S.[1], Sharkey, T.[1], Ticachek, A.[1], Parker, R.[1], Wall, K.[1], Vwalika, B.[1], Inambao, M.[1], Kilembe, W.[1], and Allen, S.[1]

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Introduction

Unplanned pregnancies and HIV impact young women the most in sub-Saharan Africa. Long-Acting Reversible Contraception (LARC) i.e., hormonal implant and intrauterine device use remain extremely low, young women (15-24) have up to 8 times more HIV than men in Zambia. We created an integrated family planning (FP)/HIV prevention program for HIV- Female Sex workers (FSW) that combined FP education with enhanced access to LARC with HIV testing/counseling, screening, and treatment for sexually transmitted infections (STIs), condom provision, PrEP referral and risk reduction counseling. This study aims to assess how fertility intentions affect LARC use in this population.

Methods

From 2012 to 2017, Center for Family Health Research in Zambia (CFHRZ) recruited 389 HIV- FSW 18 to 45 years from known hotspots for sex work in two main cities, Lusaka, and Ndola. Participants were followed up quarterly for up to 5 years. We reviewed reproductive goals and contraceptive options at each visit and offered LARC to any woman not pregnant or not using LARC. We collected demographic characteristics, sexual behavior, and reproductive history by direct data entry on Survey CTO and predicted baseline fertility intentions with LARC use using multivariable logistic regression.

Results

Of the 389 FSW, 88/389 (22.6%) were on LARC, the rest were either on non-LARC methods or no FP at baseline. Of those not on LARC, 99/301 (32.9%), initiated LARC thus culminating in a total of 187 LARC users throughout the study. This represents an uptake rate of 15.21 per 100 person-years (95% CI: 12.33-18.76). At baseline, 119 (30.6%) women expressed intent to have children within the subsequent 3 years), the remainder expressed a desire to delay childbearing until after 3 years or not to have any more children. FSWs who wanted to delay childbearing until after three years (P-value < 0.001) or to stop having children (P-value = 0.011) respectively, were 3.23 and 3.04 times more likely to be using a LARC method when compared to those who wanted to have children in three years. After multivariate analysis, we found independent factors associated with baseline LARC use i.e., literacy, parity, and condom-less sexual debut. Women who understood English with difficulty (aOR=0.39, P=0.002) or not at all (aOR=0.34, P=0.002) had lower odds of using LARC at baseline. FSW who had given birth 1-3 times (aOR=14.67; P< 0.001) or greater than 3 times (aOR=7.31; P=0.006 respectively) had a higher likelihood of using a LARC method at baseline. FSWs who reported condom-less sexual debut were more likely to use LARC than women who reported having used a condom at their sexual debut (aOR=2.97; P=0.003).

Conclusion

Integrating an FP and HIV prevention can increase LARC use among FSWs, who are at a heightened risk of both unintended pregnancies and STIs, including HIV/AIDS.

120. ASSOCIATION OF UROGENITAL SCHISTOSOMIASIS WITH HIV AND OTHER SEXUALLY TRANSMITTED INFECTIONS IN A LARGE COMMUNITY-BASED COHORT IN ZAMBIA

Scientific Abstract (Oral)

Shanaube, K.[1], Ndubani, R.[1], Lamberti, O.[2], Kasese, N.[1], Neufeld, B.[2], Webb, E. [3], Nyondo, B.[1], Cheeba, M.[1], Kelly, H.[2], Ayles, H.[1], and Bustinduy, A.[2]

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Introduction

There is a geographical and epidemiological overlap between the ongoing HIV-1 epidemic in sub-Saharan Africa and urogenital schistosomiasis, a disease caused by the waterborne parasite Schistosoma (S.) haematobium that affects around 90 million people with half of the cases affecting women with dire consequences for their sexual and reproductive health. There is compelling evidence of an association between schistosome infection and increased HIV-1 prevalence, and suggestion of increased transmission in women with female genital schistosomiasis (FGS). Chronic genital inflammation caused by S.haematobium eggs is hypothesized to facilitate HIV-1 transmission. The role of Sexually Transmitted Infections (STI) in HIV acquisition in the presence of FGS is not well known. The Schista study is a 3-year longitudinal cohort designed as a one-stop intervention to integrate home-based genital self-sampling for S.haematobium and Human Papillomavirus (HPV) by molecular testing, and self-testing for HIV and Trichomonas(T.) vaginalis in two urogenital schistosomiasis endemic areas in Zambia. We examined the cross-sectional association between S.haematobium with HIV-1 and other STIs (HPV, T.vaginalis) using baseline data collected over nine months (January 2022- September 2022).

Methods

Women aged 15-50 years, who were sexually active were randomly selected using a community-based cluster sampling. After obtaining informed consent and completing questionnaires on demography, clinical symptoms and water contact information, women were asked to collect at least 15 ml of urine, two cervicovaginal self-swabs for the detection of S.haematobium and HPV. A rapid oral HIV-1 self-test, and one vaginal self-swab for T.vaginalis were also administered and results were read and given immediately. Women were referred for treatment at the clinic where a midwife collected two cervicovaginal swabs and a cervicovaginal lavage. Hand-held colposcopy images were also obtained. A urine test was analysed via microscopy for S.haematobium ova detection. High risk HPV was detected by GeneXpert. Chi-squared tests were used to check the associations between S.haematobium, site, risk factors and morbidity. Univariable and multivariable logistic regression were conducted for S.haematobium associations with independent variables. Stepwise regression approach was used for the multivariable adjusted model.

Results

Overall, 1,572 women were recruited; median age 28 (1QR: 22-36); 18.2% (265/1457) were HIV-1 seropositive with 2.9% (23/782) newly HIV-1 positive. The prevalence of S.haematobium infection by microscopy was 4.8% (67/1572), TV prevalence by RDT was 10.2% (160/1572) and HR-HPV prevalence was 25.6% (174/680). Majority of women who were S.haematobium positive were aged 15-19 years (35.8%) and in secondary school (44.8%). Adjusted odds ratios (OR: 2.82; 95%CI: 1.29-4.51; P=0.03) revealed a significant association between T.vaginalis infection and S.haematobium egg-patent infection after adjusting for age, education and working status. There was no significant association between prevalent HIV-1 and S.haematobium urinary infection. (OR: 0.45; 95%CI: 0.19 – 1.10; p=0.07). Further adjusted analysis controlling for age, district and employment status found an association between women with T.vaginalis and prevalent HIV-1. (OR: 2.41; 95%CI: 1.50 – 3.47; p<0.001)

Conclusion

In our preliminary baseline analysis, genital infection with T.vaginalis was associated to both egg patent S.haematobium infection and prevalent HIV-1. Ongoing analysis of genital samples and images for FGS will help refine these associations.

121. PREVALENCE OF K540E MUTATION IN PLASMODIUM FALCIPARUM ISOLATES AMONG ASYMPTOMATIC PREGNANT WOMEN RECEIVING IPTP-SP AT SELECTED CLINICS IN NCHELENGE DISTRICT NORTHERN ZAMBIA

Scientific Abstract (Oral)

Kasonde, B[1]., Chaponda, M[1]., Mwanza, S[1]., Chaponda, E[2]., Simbeye, L[1]., Chileshe, J[1]., Ghilardi, L[3]., Chandaramohan, D[3]., and Chico, M[3].,

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Introduction

Interventions to reduce the burden of malaria in pregnancy in sub-Saharan Africa are inadequate. Malaria infection during pregnancy is responsible for adverse birth outcomes. To protect against adverse pregnancy outcomes in malaria-endemic areas, the WHO recommends providing intermittent preventive treatment with sulfadoxine-pyrimethamine (IPTp-SP) to pregnant women at each scheduled antenatal (ANC) visit as directly observed therapy from the second trimester to delivery with at least one month between doses. However, the loss of parasite sensitivity to SP has compromised the efficacy of IPTp-SP. Studies have revealed that resistance to SP is associated with Single Nucleotide Polymorphisms in the dihydrofolate reductase and dihydropteroate synthase (dhps) genes of Plasmodium falciparum including in position 540 of the dhps gene. Mutations in codon 540 of the dhps gene are proxy measures for the presence of all 5 key mutations that are markers of resistance to SP). The current study is part of the ASPIRE trial (Registration: NCT04189744) which is aimed at addressing the dual burden of malaria and curable sexually transmitted and reproductive tract infections in pregnancy. The objective of this study was to estimate the prevalence of the K540E mutation in a sample of 200 malaria positive women.

Methods

The study was cross-sectional by design and was conducted in four health facilities of Nchelenge District, a holoendemic area with a malaria prevalence estimated at 50% throughout the year. A total of 5,422 pregnant women were recruited at their first antenatal visit from November 2019 to August 2022. Dried Blood Spot (DBS) samples were collected from all the participants. Plasmodium falciparum DNA was isolated using the Chelex DNA extraction method and detected using SYBR green on the ABS 7500 fast Real-time Polymerase Chain reaction platform. The mutations were detected using Polymerase Chain Reaction restriction fragment length polymorphism method.

Results

Out of 5,422 samples, 2888 (55.1%, 95% CI= 51.9-55.5) tested positive for malaria by PCR. From those that were positive, 200 samples were randomly selected for determination of P. falciparum dhps mutations associated with drug resistance. The K540E marker was found in 68.8% (95% CI= 61.2-74.1) samples.

Conclusion

The data suggest a high prevalence of P. falciparum K540E mutation which is associated with resistance to SP among pregnant women, which may explain reduced efficacy of IPTp treatment in Zambia. More efficacious antimalarials are urgently needed to address malaria in pregnancy

122. BASELINE PREVALENCE OF BACTERIAL VAGINOSIS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CARE IN A HIGH MALARIA TRANSMISSION AREA IN NCHELENGE, ZAMBIA

Scientific Abstract (Poster)

Chikwanda, E., Chaponda, M., Chaponda, E.B., Mwanza, S., Mukubuta, L.M., Malunga, P., Justin Chileshe, J., Hachizovu, S., Nambozi, M., Gwasupika, J., Daka, V., Ghilardi, L., Bruce, J., Chandramohan, D and Chico, R.M.

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Introduction

Bacterial vaginosis (BV) is the most common urogenital disorder in the world among women of reproductive age and increases the odds of preterm delivery 1.5-2 times. Malaria infection and curable sexually transmitted and reproductive tract infections (STIs/RTIs) during pregnancy are very common in East and Southern Africa and associated with adverse pregnancy outcomes. A pregnancy cohort in Nchelenge found an estimated 48.3% of pregnant women in Nchelenge, had bacterial vaginosis (BV) whereas 29.2% had malaria and BV co-infection. The World Health Organization recommends intermittent preventive treatment of malarial in pregnancy (IPTp) using sulfadoxine-pyrimethamine (SP) to protect against adverse pregnancy outcomes attributable to malaria, and metronidazole (MTZ) is indicated for BV or TV. Syndromic management of curable STIs/RTIs fails to detect the infections in women for whom STIs/RTIs are asymptomatic. The objective of this study is to determine the efficacy of IPTp-SP plus MTZ, and IPTp-DP plus MTZ on curable sexually-transmitted and reproductive -tract infections (STIs/RTIs) relative to IPTp with SP alone. The present study is part

of the ASPIRE trial (Registration: NCT04189744), a 3-arm, parallel, partially placebo-controlled, individually randomised, phase -3, superiority trial of 5, 436 pregnant women in Nchelenge District of Zambia which aims to address the dual burden of malaria and curable STIs/RTIs in pregnancy.

Methods

Consenting, HIV-negative pregnant women with a gestational age between 16-28 weeks were tested for BV by Gram stain microscopy based on the Nugent score. Vaginal smears were collected at enrolment and second antenatal visits. BV diagnosis was based on the Nugent criteria (7-10 and 4-6 in the presence of clue cells). Slide reading was done by two readers and disparities were settled by a third reader. Any disparities were resolved by the 3rd reader.

Results

At antenatal enrolment, 1865 (34.4%, 95% CI: 33.1 to 35.7) of women had BV with a Nugent score of at least 7 and 186 (3.4%, 95% CI: 2.1 to 3.9) women had a score of 4 to 6 with the presence of clue cells. Of the 440 BV slides analysed for second antenatal visit, 93 women (21.1%, 95% CI:17.4 to 25.3) had BV with a Nugent score of at least 7 and 18 (4.1%, 95% CI:2.4 to 6.3) had a Nugent score of 4-6 with presence of clue cells.

Conclusions

Bacterial Vaginosis was common among pregnant women in this low-resource setting in Nchelenge district. Point of care tests are urgently needed to diagnose the STIs/RTIs, especially the asymptomatic infections which contribute significantly to adverse pregnancy outcomes. Providing metronidazole to pregnant women appears to reduce the incidence of BV and may reduce adverse birth outcomes in this population. Syndromic management of STIs/RTIs, despite being useful, does not go far enough to diagnose and treat infections in resource limited settings.

123. THE PREVALENCE OF MALARIA AMONG PREGNANT WOMEN AT THEIR FIRST ANTENATAL VISIT IN NCHELENGE

Scientific Abstract (Poster)

Mukubuta, I.L. Chaponda, M., Mwanza, S., Chaponda, B.E., Malunga, P., Chanshika, B., Chileshe, J., Ghilardi, L., Chandramohan, D. and Chico, M.

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Introduction

In sub-Saharan Africa, malaria in pregnancy (MIP) is very common with one-third of women infected. MIP is associated with adverse pregnancy outcomes including miscarriage, stillbirth, prematurity, and low birth weight and is associated with neonatal death. Malaria parasites sequester in the placenta and, therefore, testing a peripheral blood sample may fail to detect some maternal infections. World Health Organization (WHO) recommends providing intermittent preventive treatment using sulfadoxine-pyrimethamine (IPTp-SP) from the second until delivery to clear placental infection. The prevalence of malaria among pregnant women resident in Nchelenge, a district in Luapula province of Zambia was investigated.

Methods

As part of a 3-arm, parallel, partially placebo-controlled, individually randomised, phase-3, superiority trial for malaria chemoprevention which enrolled 5,436 pregnant women in Nchelenge District of Zambia between 2019-2022, dried Blood Spot (DBS) samples were collected from all the participants at the enrollment visit. Plasmodium falciparum DNA was isolated using the Chelex DNA extraction method and detected using SYBR green on the ABS 7500 fast Real-time Polymerase Chain reaction platform.

Results

Out of 5, 422 samples, 2888 (53.3%,) tested positive, the identified prevalence of malaria was 53.3 % (95%CI 51.9-54.5)

Conclusion

Malaria prevalence in Nchelenge among pregnant women continues to be high and has devastating consequences for the mother and the foetus. The efficacy of Intermittent preventive treatment in pregnancy with sulfadoxine-pyrimethamine, recommended by the WHO, is threatened by high-level parasite resistance to SP. Therefore, more efficacious antimalarial drugs need to be developed to address malaria and its adverse birth outcomes in malaria endemic countries.

124. SEXUALLY TRANSMITTED INFECTIONS AND PREGNANCY: A QUALITATIVE STUDY OF BELIEFS AND HEALTH SEEKING BEHAVIOURS IN ZAMBIA.

Scientific Abstract (Poster)

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Introduction

Compared with HIV, other sexually transmitted infections (STIs) have been neglected in low- and middle- income countries. For pregnant women, some untreated STIs can increase the risk of adverse pregnancy outcomes, including preterm birth and neonatal death. The study set out to explore the real-life experiences of pregnant women diagnosed with and/or suspected as having gonorrhoea, chlamydia, syphilis or trichomoniasis during pregnancy.

To describe the prioritization of STIs (other than HIV) in pregnancy from the perspective of policy makers, health care providers and other key informants.

Methods

A qualitative study was nested in a randomised controlled trial among pregnant women in Nchelenge, Zambia, from 2nd January to 16th May 2022. Purposive sampling was used to recruit pregnant women and postnatal women diagnosed with or suspected as having gonorrhoea, chlamydia, syphilis or trichomoniasis. Snowball sampling was used to identify and recruit key informants from the Ministry of Health and non-governmental organisations. We applied thematic analysis with constructs derived a priori from the Health Belief Model.

Results

In total, 30 participants were recruited, of these, 10 were pregnant women, 10 postnatal women and 10 key informants.

Pregnant women's perception

There was a perception among pregnant women that women had low levels of knowledge and awareness of the risks of STIs in pregnancy.

There was a perspective among participants that pregnant women who are identified as having or suspected of having an STI during pregnancy are at risk of being judged by men and women in the community as having more than one sexual partner (described as "promiscuous").

Key informant's perspectives

There was a perception among key informants that attention to date has been on HIV in pregnancy, that frontline healthcare workers have limited training and therefore knowledge in the detection and treatment of STIs other than HIV in pregnancy.

Key informants viewed training as being important to improve the detection and management of STIs in pregnancy, but also noted ongoing issues in supply chain and limited resources for staff, test kits, reagents and drugs.

Key informants deemed low levels of literacy among pregnant women as a barrier to diagnosis and treatment for STIs in pregnancy.

Pregnancy clinical examination by male midwives and nurses was identified as a barrier for pregnant women to be assessed for STIs.

Conclusion

Community sensitisation, information and health promotion are urgently needed at community level to de-stigmatise STIs, to increase knowledge and awareness of the risks of, and appropriate care for, STIs in pregnancy.

Education and diagnostic supplies for healthcare providers are needed to enhance their skills in diagnosis and management of STIs.

Ensuring women health care providers are available for gynaecological examination may increase the acceptability of testing uptake among pregnant women.

125. PREDICTORS OF HIGH VIRAL LOAD AMONG ADOLESCENT HIV RECIPIENTS OF CARE IN ZAMBIA, 2021: A CROSS-SECTIONAL ANALYSIS OF HIV CASE-BASED SURVEILLANCE DATA

Scientific Abstract (Poster)

Nyimbili, S.[1], Kalubula, M.[2], Bosomprah, S.[3], Somwe, P.[4], Mutale, J. [4], Lumpa, M.[4], Pry, J.[1], Mwamba, D.[4], Hanunka, B.[5], Mweebo, K.[5], Mudenda, M.[5], Funsani, P.[2], Sianyinda C.[2], T.[1], Mwansa, M.[2], Sivile, S.[2], Tally, L.[5], Minchella, P.[5], Wa Mwanza, M.[1], Savory, T.[1], Bolton, C.[1], Sikazwe, I.[1], Mulenga, L.[2], and Phiri, C.[2]

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Introduction

Although Zambia has made significant progress in attaining the 90-90-90 UNAIDS targets for epidemic control, additional work and investment are required to sustain high viral suppression coverage and reach the 95-95-95 UNAIDS targets for an AIDS-free country by 2030. Identifying and characterizing predictors of high viral load among priority population on antiretroviral treatment (ART) such as adolescents, could help guide development of targeted interventions critical to improving HIV treatment outcomes and turn the tide against AIDS. The study was set out to characterize and determine predictors of high viral load among adolescent HIV recipients of care in Zambia.

Methods

We conducted a cross-sectional analysis of HIV case-based surveillance data from January to December 2021 of adolescent RoC (10-19 years) in Zambia with record of receiving antiretroviral

therapy (ART) for ≥ 6 months and latest valid viral load (VL) measurement per national electronic health record (SmartCare). We assessed association of sociodemographic characteristics and ART duration as at 31 December 2021, with high VL load, defined as >1,000 copies HIV RNA copies/mL, based on the latest documented VL measurement in 2021. Regression analyses were conducted to estimate unadjusted and adjusted odds ratios to estimate effects of covariates independently associated with high VL.

Results

A total of 21,993 HIV RoC met inclusion criteria with a majority (68.2%) female, a median age of 15 years (interquartile range [IQR] 10-19), and median duration on ART of 45 months (IQR: 6-427). High VL occurred in 1,943 (8.83%) RoC, of whom 1,273 (65.52%) were females, and 1,374 (70.72%) had been on ART for > 18 months. Factors independently associated with high VL included: younger age 10-14 (adjusted odds ratio [aOR]=1.32, 95% confidence interval [CI]: 1.20-1.47) compared to 15-19 years, and shorter duration on ART: 7-12 months (aOR =1.31, 95% CI: 1.12-1.53), 13-18 months (aOR =1.20, 95% CI: 1.01- 1.42) compared > 18 months.

Conclusions

We identified being new on ART and younger adolescence as predictors of high VL. Intensifying activities centered on service delivery models for these risk groups will help the country in its efforts to reach the UNAIDS 95 95 95 goal. Further evaluation of existing interventions among younger adolescents (10-14 years) may identify gaps in HIV service delivery, caregiver support and other risk factors. Identifying pathways for high VL among identified sub-populations may represent an opportunity to achieve the 95-95-95 targets.

126. ABORTION CARE SERVICES IN LUSAKA AND COPPERBELT PROVINCES OF ZAMBIA: USERS' EXPERIENCES AND PERCEPTIONS

Scientific Abstract (Poster)

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Introduction

Globally, 10 to 15 per cent of women who knew they were pregnant experienced a miscarriage. The sub-Saharan region shares this burden disproportionately, with abortion-related mortality estimated at 90 per 100,000 live births. In Zambia, 7% of all maternal deaths are abortion, related, despite the country having made a long-standing political and policy commitment to address morbidity and mortality associated with abortion, evident from the 2009 Standards and guidelines for reducing unsafe abortion morbidity and mortality in Zambia. These guidelines are operationalized from the Termination of Pregnancy Act of 1972. Despite the available provisions, women continue to face barriers to accessing abortion care services, such as low knowledge of the legal provisions, high financial and emotional costs, conservative attitudes towards safe abortion, and hostility or lack of willingness to provide services by healthcare workers. Therefore, this study aimed to explore the experiences and perceptions of women receiving post-abortal care services in two provinces of Zambian.

Methods

A qualitative case study was conducted between August and September 2021 in nine selected tertiary government hospitals in Zambia's Lusaka and Copperbelt provinces. Participants were purposively enrolled on discharge from the health facility after obtaining written informed consent. Individual interviews with women seeking abortal care services were conducted in private rooms for confidentiality, using audio recorders, and transcribed data was analysed using thematic analysis. To understand how women claimed their rights when seeking care, we used the Availability, Accessibility, Acceptability and Quality (AAAQ) framework. The right to health as the central standard for assessing health care imposes four essential standards on health services, availability, accessibility, acceptability and quality. The AAAQ standard reaffirms that the "availability of services requires that public health and healthcare facilities are available in sufficient quantity, taking into account a country's developmental and economic condition".

Results

We purposively enrolled 15 participants after reaching thematic saturation, the age range of 17 to 45 years. Three major themes emerged- (i) women's experiences of abortion and their healthcare-seeking behaviour, (ii) perceptions of the healthcare system and their knowledge of the legality of abortion (iii) their views on possible measures to improve post-abortion care services. Some women delayed seeking post-abortion care (PAC) because they feared the negative attitudes from their communities and the health care system. In some cases, clients reported making payments for services directly to the provider and not direct costs for tests or consumables.

Conclusion

Women seeking post-abortion care services experienced barriers to accessing quality health services. Therefore, there is a need to continue strengthening post-abortion care to ensure that women easily access the service. Further, there should be continued community education around Zambia TOP act in a culturally sensitive manner.

127. KNOWLEDGE, ATTITUDE AND PRACTICES OF COVID-19 AMONG MEDICAL LABORATORY PROFESSIONALS IN ZAMBIA

Scientific Abstract (Oral)

Chawe, A.[1], Mfune, R.L.[2], Syapiila, P.M.[2], Zimba, S.D.[3], Vlahakis, P.A.[4], Mwale, S.[5], Mwape, K.[2], Chirambo-Kalolekesha, M.[2], Chileshe, M.[6], Mutale, J.[7], Mudenda, T.[8], Manda, G.[9], and Daka, V.[2]

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Introduction

Coronavirus disease 2019 (COVID-19) is a novel disease that has spread to nearly every country worldwide. Medical laboratory professionals are key in the fight against COVID-19 as they provide confirmatory diagnosis for subsequent patient management and mitigation of the disease. This study investigated the knowledge, attitude and practices of COVID-19 and their predictors among medical laboratory personnel in Zambia.

Methods

We conducted a cross-sectional study among medical laboratory professionals in Zambia from 10th to 29th June 2020. Data were collected using Google Forms and exported to Statistical Package for

Social Sciences version 23 for statistical analysis. Independent predictors of COVID-19 knowledge and practices were determined. Adjusted odds ratios (AOR) and their 95% confidence intervals (CI) are reported.

Results

A total of 208 medical laboratory professionals, 58.2% male and 42.8% female, participated in the study. The majority of respondents had good knowledge (84.1%) and practice (75.0%) regarding COVID-19. Poor knowledge and practices were present in 15.9% and 25%, respectively. Predictors of good knowledge included having a bachelor's degree (AOR: 5.0, CI: 1.13-22.19) and having prior COVID-19 related training (AOR: 8.83, CI: 2.03-38.44). Predictors of good practice included having prior COVID-19 related training (AOR: 14.01, CI: 6.47-30.36) and having a master's or Doctor of Philosophy (PhD) qualification (AOR: 5.23, CI: 1.15-23.87) and type of laboratory facility (AOR: 3.09, 95%CI: 1.01-9.45).

Conclusion

Our study revealed that the majority of Zambian medical laboratory personnel are familiar with and follow sound COVID-19 best practices. However, there was a sizable number of staff who lacked solid information and best practices. This is concerning because it is expected of medical professionals, by virtue of their education and training to have strong knowledge and best work practices in COVID-19. In order to ensure that medical laboratory specialists are knowledgeable about and aware of best procedures to assist manage the epidemic, continuous professional development is necessary.

128. AN INTENSIVE LONGITUDINAL COHORT TO STUDY MALARIA TRANSMISSION IN A PRE-ELIMINATION OF SOUTHERN ZAMBIA: A DESCRIPTIVE SUMMARY OF RESULTS

Scientific Abstract (Oral)

Schue, J.L[1]., Matoba, J[2]., Hamapumbu, H[2]., Musonda, M[2]., Kobayashi, T[1]., Lubinda, M[2]., Mwaanga, P[2]., Katowa, B[2]., Simubali, L[2]., Mburu, M[2]., Shields, T.M[1]., Hackman, A[1]., Thuma, P.E[1,2]., Simulundu, E[2]., Norris, D.E[1]., Wesolowski, A[1]., and Moss, W.J[1].

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Introduction

Southern Province Zambia is an area of low malaria transmission that is aiming for elimination. However, low levels of transmission have been ongoing for the past decade and it is unclear how transmission is sustained. The study set out to describe the households and participants who were found to be parasite positive but asymptomatic in an intensively followed cohort study in an area of Zambia nearing malaria elimination.

Methods

An intensive longitudinal cohort study was designed to capture all incident infections of malaria in a geographically contiguous area. The area was in Choma District, Southern Province Zambia. Households within the catchment area of a single rural health center were enrolled. During monthly collections from October 2018 through September 2020, all household members and overnight visitors were surveyed, and a blood sample was collected. Passive surveillance was also established at the health center. Blood samples were tested by real-time PCR for Plasmodium falciparum parasites. In a subset of study households, entomological collections were made both indoors and outdoors and mosquito species were morphologically identified and verified molecularly.

Results

A total of 197 households and 1,116 individuals were enrolled in the cohort. 147 of the enrolled individuals were found to be positive for P. falciparum during at least one visit over the two years of the study. There were 206 cases of malaria enrolled through passive surveillance. Of these, four clinical cases were also enrolled in the cohort, but study activities were paused during this time due to the SARS-CoV2 pandemic. Parasite prevalence by PCR was between 0-4% during the 21 months of active surveillance and nearly all parasite positive cohort participants had parasitemia levels below 10 parasites per microliter. None of the cohort participants were found to be RDT positive during a study visit. Population movement in for form of residents travelling or visitors coming to stay in the area was common. There was a large variety of mosquito species caught both in indoor and outdoor traps.

Conclusion

It is unclear if the low levels of parasitemia found in the cohort are a result of incident or chronic infections and if they are contributing to ongoing transmission. The current test and treat strategy

used to bring this area closer to malaria elimination will not capture these low-level infections with standard diagnostic tools. If this area is to achieve elimination, new strategies to detect and eliminate the remaining parasite reservoir in the community and prevent reintroduction from movement and travel are needed.

129. SEROLOGICAL MARKERS OF INCIDENT AND CHRONIC PLASMODIUM FALCIPARUM INFECTION

Scientific Abstract (Oral)

Schue, J.L[1]., Matoba, J[2]., Hamapumbu, H[2]., Musonda, M[2]., Kobayashi, T[1]., Lubinda, M[2]., Mwaanga, P[2]., Katowa, B[2]., Simubali, L[2]., Mburu, M[2]., Shields, T.M[1]., Hackman, A[1]., Thuma[1,2], P.E., Simulundu, E[2]., Norris, D.E[1]., Wesolowski, A[1]., and Moss, W.J[1].

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Introduction

Studying malaria in low-transmission settings is challenging due to the infrequency of clinical infections and low levels of asymptomatic parasitemia found in the broader community. Malaria infections with low levels of parasitemia, which are common in low transmission settings, can be the result of incident or chronic malaria infections, but differentiating the two can be challenging. Sero-epidemiology has long been used in surveillance projects to estimate exposure or protection from vaccine preventable diseases in populations. More recent work had found that antibody responses to some specific Plasmodium falciparum antigens make act as markers of recent infection. The study set out to use longitudinal antibody responses to a selection of P. falciparum antigens that invoke varying immune responses to improve our understanding of low parasitemia infections.

Methods

Samples from the first 13 months, Oct 2018 through October 2019, of a two-year longitudinal cohort in a low transmission setting of Choma District Zambia were used with a multiplex bead immunoassay to measure changes in antibody response over time. The assay included 17 P. falciparum antigens, which have either been previously found to induce antibodies that can be used as markers of recent

infection or cumulative exposure. The changes in antibody response were compared between cohort participants that were ever found positive for P. falciparum to those never found positive, stratified by age. The difference in antibody levels between a pre and post parasitemic event were measured.

Results

Several of the antigens included in the assay showed a correlation between age and measured antibody level, most of these are common markers of cumulative exposure. There were no changes found in antibody level following a parasite positive event and there were no differences found between ever-positives and never-positives. Most individuals had low variation in antibody levels over time, but several in both the ever and never positive groups showed large changes that did not have a consistent pattern between individuals or in relation to a PCR positive event.

Conclusion

The lack of antibody response after parasite positive event suggests that these low level parasitemia infections may be chronic. Additional testing of the second year of the cohort samples is needed to increase the number of samples tested and the length of time following a positive event.

130. USER PERCEPTION ON THE SERVICES PROVIDED BY NATIONAL HEALTH INSURANCE MANAGEMENT AUTHORITY TO EMPLOYEES AT NATIONAL INSTITUTE FOR PUBLIC ADMINISTRATION (NIPA) IN LUSAKA, ZAMBIA

Scientific Abstract (Poster)

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Introduction

The National Health Insurance Management Authority (NHIMA) is a social health insurance programme designed by the Republic of Zambia to compliment sources of financing the health sector

and to improve access to health care for the people of Zambia. The study was based user perception on the services provided by National Health Insurance Management Authority at National Institute for Public Administration (NIPA).

Methods

Twenty five (25) participants were involved in the study. The main purpose of the study was to evaluate the user's perception of the services provided by National Health Insurance Management Authority to National Institute for Public Administration (NIPA) employees. Specifically, the study evaluated the services provided by NHIMA; the benefits of the services provided by NHIMA and the challenges in accessing the services provided by NHIMA. A case study approach was adopted for this study and employed a qualitative approach Purposive sampling was used to select the 30 participants. Data was gathered using semi - structured interviews.

Results

Data analysis was done thematically and the following findings emerged from the study: it was revealed from the study that the participants were aware of the services provided by NIHMA which included medical, laboratory and many more. The study also revealed that participants benefited from the NHIMA because they could access services which they could not have accessed using their own resources. Furthermore, it was revealed from the study that the challenges the participants experienced with NHIMA is that not all medical requirements were attended to adequately.

Conclusion

The study concluded by recommending that more medical institutions should be accredited to NHIMA and that the NHIMA facility should also accommodate members of the extended families.

131. FEMALE GENITAL SCHISTOSOMIASIS AND STI PREVALENCE AMONG AT-RISK WOMEN FOR HIV IN ZAMBIA

Scientific Abstract (Poster)

Mwangelwa, S[1]., Kabengele, C[1]., Kilembe, W[1]., Himukumbwa, C[1]., Musale, V[1]., Rogers, E[2]., Mumba, K[1]., Chanda, C[1]., Parker, R[2].,Tichacek, A[2]., Inambao, M[1]., Vwalika, B[3].,Allen, S.[2] and Wall, K.M.[2]

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Introduction

Young women remain disproportionately affected by HIV in sub-Saharan Africa with prevalence as much as eight times higher than men of matching age groups. Among women, female genital schistosomiasis (FGS) and STIs are associated with risk of HIV infection. In a cohort of HIV- young women at increased risk of HIV at Center for Family Health Research in Zambia (CFHRZ), the HIV incidence of 3/100 PY, we conducted a cross-sectional survey to ascertain the prevalence of FGS and its risk factors and STIs among women.

Methods

From March 2020 – December 2021, we surveyed women in the cohorts at CFHRZ in Lusaka and Ndola, Zambia and assessed FGS risk factors and positivity using colposcopy. We also collected genial samples and tested them for Chlamydia, Gonorrhea, and Human Papilloma Virus (HPV) using Gene Xpert. We evaluated factors associated with FGS positivity using logistic regression.

Results

Among 536 women, overall FGS prevalence was high at 23.5%. The most common FGS indicators on colposcopy were abnormal blood vessels and homogenous yellow sandy patches. From the survey, factors associated ($p<0.1$) with FGS positivity included: living in a village or rural area prior to the age of 16, younger age at first intercourse, menstruating less than once per month, not using disposable sanitary pads or reusable cloths/towel during menstruation, and use of the hormonal contraceptive

implant. On physical examination, associated factors included: presence of bilateral inguinal adenopathy, cervicitis, non-bloody discharge from cervix, and cervical nodules. FGS co-infection with a high-risk HPV type was common (36%), with Chlamydia (9%) and with Gonorrhea (5%) but the difference in prevalence of these infections compared to women without FGS was not statistically significant. These genital abnormalities were mostly asymptomatic.

Conclusion

This is one of the first studies to report that the prevalence of FGS in young HIV- women living in urban areas in Zambia is concerningly high. Further, it is not uncommon for women with FGS to have other genital pathology and this exacerbates their risk of HIV acquisition. This study underscores the need for focused interventions to address genital abnormalities among young women in sub-Saharan Africa to mitigate the risks of HIV acquisition.

132. ACCELERATING COUNTRY-LED DIGITAL HEALTH TRANSFORMATION FOR DATA USE AND IMPROVED HEALTH OUTCOMES.

Best Practices Abstract (Poster)

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Introduction

As countries digitize their health systems, health practitioners and ministries of health are learning what makes the development and introduction of digital health tools and approaches successful. However, global policies and digital health investments often do not reflect the priorities and lessons that have emerged from these countries' experiences.

To help bridge this gap, PATH and Cooper/Smith partnered on the Data Use Acceleration and Learning (DUAL) initiative, to reflect country lessons on data use and digital transformation within future global health policies, interventions, and funding mechanisms.

Method

Following a research process that involved comprehensive documents reviews and stakeholder consultations, DUAL synthesized learnings from five countries –Burkina Faso, Ethiopia, Malawi, South Africa, and Tanzania – who received funding from the Bill & Melinda Gates Foundation and support from implementing partners to systematically digitalize health care systems and strengthen the use of health data to achieve better health outcomes.

Results

We then packaged these country experiences into a model for digital transformation for data use that evolves the World Health Organization (WHO) and International Telecommunication Union (ITU) eHealth Strategy Building Blocks. The DUAL model identifies ten key elements for transforming a country's digital health system— governance and leadership, strategy, investment, systems architecture, services and applications, health workforce, policy and standards, digital health infrastructure, data use ecosystem, and change management. (Data use ecosystem and change management are "new" elements added to the eight existing elements previously included in the WHO/ITU model.) Research from the five countries shows that developing strong data use ecosystems and change management approaches accelerate digital transformation for data use. This model emphasizes the importance of strengthening data use culture and of change management at all levels of health care systems to support the uptake of digital health tools.

Conclusion

The DUAL model serves as a practical, comprehensive guide to advancing the use of data to advance health equity by distilling key factors of success for each element. Countries with health systems at any stage of their digital transformation process can choose the actions that make sense within the context of their digital health systems.

To ensure buy-in and adoption of this model, DUAL is partnering with country governments to promote uptake and adoption. We are also identifying and working with global and regional

champions of the model including country government representatives, implementers, funders, and policymakers to integrate learnings into existing policy and funding landscapes.

During this presentation, the DUAL team will share the model's key elements that drive digital transformation for data use and decision making in addition to sharing in-country experiences.

133. CHARACTERIZATION OF HEPATITIS B IMMUNE RESPONSES IN HIV-HBV COINFECTED PATIENTS USING FINE NEEDLE ASPIRATION

Scientific Abstract (Oral)

Musonda, T., Sinkala, E., Nsokolo, B., Asombang, M., Lauer, G., Chung, R.T., Kelly, P., and Vinikoor, M.J.

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Introduction

Hepatitis B virus is an efficient human pathogen, having infected an estimated 2 billion humans worldwide. While HIV tends to worsen HBV outcomes, relatively higher rates of HBV functional cure during HBV-active ART has been observed in HIV-HBV coinfected patients. We hypothesize that in HIV-HBV coinfection, treatment with ART not only restores but may enhance HBV-specific immune responses compared to patients who are HIV-negative and take similar drugs. The liver (site of HBV viral replication and disease pathogenesis) has immunological composition which is distinct from blood. An example is the presence of HBV specific CD8 T cells whose markers are never expressed in blood and the presence of persistent HBV and cccDNA. This gives the liver unique immune responses to HBV and therefore, liver tissue must be used in HBV virological and immunological studies to understand the virus-host interactions. The purpose of this study is to identify and characterize the immune mechanisms through which patients with HIV-HBV coinfection achieve HBV functional cure during tenofovir-based ART.

Methods

In an ongoing prospective observational study being carried out at UTH, Kanyama 1st Level Hospital and Matero 1st Level Hospital, patients with HIV-HBV coinfection and HBV monoinfection were enrolled. After collection of blood for safety tests and an ultrasound, if no contraindications, liver cells are aspirated using a tiny needle (25 gauge). In the laboratory, red blood cells that contaminate the liver cell sample are depleted and 20,000 immune cells are loaded into a single cell capturing device called the hive that increases the recovery rates of fragile cells and has barcoded mRNA capture beads. The barcoding approach allows individual cells to later be studied. The cells are lysed allowing mRNA to bind to beads. mRNA is then amplified to create libraries which are sequenced and analysed using the Honeycombs custom BeeNet software. Sequencing data is used to characterize the distribution of cell types and profile cell expression patterns. After 1 year on ART, patients undergo a repeat FNA allowing for analysis of changes in the liver.

Results

To date, 113 patients enrolled, including 59 with HIV-HBV coinfection, 46 with chronic HBV monoinfection, and 8 with acute HBV monoinfection. The average age of participants was 33 years (range 19-61) and 62.0% were men. 86 successfully underwent liver FNA without complications other than mild pain at the puncture site. Initial analysis of liver cells has revealed a wide distribution of immune cell types such as monocytes, neutrophils, NK/NKT/T cells, B cells, cycling cells and megakaryocytes.

Conclusion

Liver fine needle aspiration is a feasible alternative approach to liver core biopsy and allows for sophisticated study of the immune response to HBV. Understanding the immune benefits of ART in the treatment of HIV-HBV coinfection could lead to better treatments in patients with chronic HBV who are HIV-negative.

134. EFFECT OF MODE OF SCHOOLING ON PREGNANCY AMONG SCHOOL GOING TEENAGERS: A RETROSPECTIVE CASE CONTROL STUDY IN EASTERN PROVINCE, ZAMBIA.

Scientific Abstract (Poster)

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Introduction

The proportion of teenage pregnancy (TP) and child bearing remains high in Eastern province, which ranks third highest in the country. This study sought to establish the effect of boarding schooling (exposure) on pregnancy among school going teenagers by comparing boarding and day secondary schooling, controlling for other characteristics.

Methods

The study employed a retrospective case-control design involving 783 pupils from nine boarding and nine-day secondary schools in eastern province using secondary data from 2019 to 2021. A census of 261 cases and a random sample of 522 controls were obtained. The study used STATA 16.0 MP software for statistical analysis. Model estimation involved use of the binomial logistic regression, adjusting for 18 school clusters. Various fit statistics aided the best-fit model estimation. A 5% level of significance was adopted for all inferential analysis.

Results

Cases had a mean age of 17.4 years (±1.14) whereas controls were 16.1 years (±1.71) old on average. Most participants 471 (60.2%) were in senior secondary, about 40% (315) were in boarding school

and 468 (60%) were in day secondary school. Most 479 (61.2%) schools were in an urban locality, majority, 643 (82.1%) were government run and three quarters, 587 (75%) were combined (boys and girls) schools. The odds of pregnancy in those exposed was 0.25 and 0.73 for the unexposed, resulting in a crude odds ratio of 0.34 (CI: 0.24, 0.48). Controlling for other school characteristics, pupils in boarding relative to day secondary schools (OR: 0.40, CI: 0.16, 1.00, P: 0.049) had significantly reduced odds of pregnancy, whereas being in high-populated vs low populated schools (OR: 3.88, CI: 1.69, 8.87, P: 0.001) and a year increase in age (OR: 1.95, CI: 1.58, 2.52, P<0.0001) significantly increased the odds of pregnancy.

Conclusion

The study provides evidence that considering other school characteristics, the effect of mode of schooling on pregnancy is it to reduce the odds and probability of pregnancy for teenagers enrolled in boarding schools compared to those in day schooling.

135. PREVALENCE OF CURABLE SEXUALLY TRANSMITTED AND REPRODUCTIVE TRACT INFECTIONS AMONG PREGNANT WOMEN ATTENDING ANTENATAL CARE IN NCHELENGE, ZAMBIA

Scientific Abstract (Oral)

Chaponda, M., Chaponda, E.B., Mwanza, S., Chikwanda, E., Hachizovu, S., Nambozi, M., Gwasupika, J., Daka V., Ghilardi, L., Bruce, J., Chandramohan, D., and Chico, R.M.

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Introduction

Curable sexually transmitted and reproductive tract infections (STIs/RTIs) -

syphilis, gonorrhoea, chlamydia, trichomoniasis, and bacterial vaginosis - are associated with adverse pregnancy outcomes and disproportionately impact low-resource settings. The present study is part of the ASPIRE Trial (Registration: NCT04189744), a 3-arm, parallel, partially placebo-controlled, individually randomised, phase-3, superiority trial of 5,436 pregnant women in Nchelenge District of Zambia which aims to reduce the dual-burden of malaria and curable STIs/RTIs in pregnancy. Consenting women were eligible if they tested negative for HIV and were between 16-28 gestational weeks measured by sonography. We report here the prevalence at enrolment of curable STIs/RTIs.

Methods

Women provided blood samples for syphilis testing by rapid plasma reagin (RPR); RPR-reactive women were treated. Blood samples were stored for confirmatory testing for treponema pallidum. For other STIs/RTIs, per national guidelines, syndromic management has been provided throughout pregnancy. Vaginal swabs were collected for retrospective testing of gonorrhoea, chlamydia, and trichomoniasis by polymerase chain reaction (PCR) methods and for BV diagnosis by Nugent scoring (7-10 and 4-6 in the presence of clue cells).

Results

At antenatal enrolment, 15.19% (95%CI: 14.24, 16.17; 825/5,430) of pregnant women were RPR-reactive for syphilis, of whom 95.9% (791/825) were treated. Confirmatory TPHA was conducted on 415 RPR positive samples and 84.1% (95CI: 80.22, 87.48; 349/415) confirmed syphilis. 12.49% (95%CI: 11.62, 1340; 677/5,420) had gonorrhoea, 6.29% (95%CI:5.65, 6.97; 341/5,420) had chlamydia, 13.91% (95%CI: 13.00, 14.86; 754/5,420) had trichomoniasis, 37.77% (95%CI: 36.48, 3908; 2,051/5430 had bacterial vaginosis (Nugent Score 7-10, or 4-6 with presence of clue cells)

Conclusion

Curable STIs/RTIs were common among pregnant women in this low-resource setting. POC tests are urgently needed in this antenatal care setting to diagnose the STIs/RTIs, especially the asymptomatic infections which contribute significantly to adverse pregnancy outcomes. Syndromic management of STIs/RTIs, despite being useful, does not go far enough to diagnose and treat infections in resource limited settings.

136. THE INFLUENCE OF TRADITIONAL LEADERS IN PMTCT – (IN CHIEF MPEPO'S CHIEFDOM IN KANCHIBIYA DISTRICT, MUCHINGA PROVINCE IN ZAMBIA.

Best Practices Abstract (Oral)

Jere, T[1]., Ngoma, T[1]., Umuhoza, M[1]., Mwansa, G[1]., Katongo, B[1]., Wose Kinge, C[2]., Chasela, C[2]., Mwango, A[1]., Mwala, P[1]., and Chirwa, B[1].

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Introduction

While there has been a notable reduction in HIV prevalence and incidence from 60, 000 in 2010 to 51, 000 in 2019, the rates of infection in children through Mother to Child transmission (PMTCT) remains a public health concern in Zambia. The implementation of PMTCT programs has led to the reduction of transmission of HIV from mother to child during pregnancy, delivery, and breastfeeding. However, gaps still exist especially in rural areas where women face distance, geographic & financial barriers to access health services including antenatal care (ANC). Engagement with influential individuals such as traditional leaders has been shown to influence health seeking behaviors among rural communities, resulting in improved access to care and health outcomes as demonstrated at Mpepo Health Centre in the Chiefdom of Chief Mpepo in Kanchibiya District of Muchinga Province where the USAID Action HIV program is being implemented.

Methods

Through collaboration with Chief Mpepo of Kanchibiya District, the USAID Action HIV program implemented community sensitization activities aimed at educating members of the rural communities on the importance of attendance and accessing health facility antenatal clinic (ANC) for maternal and child health and HIV prevention and care services. This was an interactive session of information sharing with the chief and his advisors. Women accessing ANC care had an average of 4 visits and the number of deliveries and pregnancies was compared to show the magnitude of the issue. After that interaction, Chief Mpepo, encouraged all pregnant women with support of their

partner/husband/significant other to attend ANC. Health care workers increased accessibility to care by offering both static and outreach delivery of care.

Result

Prior to the pronouncement (requiring all pregnant women to attend ANC) only 7 and 4 women tested positive and enrolled in ART, in 2017 and 2018 respectively. After the chief's pronouncement, the coverage of women reached for HIV testing and attending ANC increased by 71%, and positive tests rose to 51 in 2020 and 47 in 2021, evidence showed that pregnant women were being missed. No positive infant has been identified in the last 3 years. Healthcare workers worked in collaboration with Safe motherhood Action Groups (SMAGs), whose efforts contributed to the results.

Conclusion

This engagement has proved that chiefs are gatekeepers in increasing subjects' access to health care delivery. With the shift of expansion of community led health care delivery of care and treatment, health education to chiefs and their buy in is necessary. We recommend expansion of the initiative to other Chiefdoms and the other two Provinces. We further recommend male involvement in ANC to facilitate access to care and reduction in Gender Based Violence.

137. EVALUATING THE OUTCOMES OF ENHANCED ADHERENCE COUNSELING INTERVENTION ON CLIENTS WITH HIGH VIRAL LOADS IN SELECTED HEALTH FACILITIES IN MONZE DISTRICT.

Scientific Abstract (Oral)

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Introduction

Enhanced adherence counselling (EAC) is a program that offers counselling of high viral load clients on ART treatment before concluding on the effectiveness of the selected ART regimen. There is a general dearth of literature on this subject. Hence, this study aimed investigate the changes in Viral Load (VL) during Enhanced Adherence Counselling (EAC) sessions and its determinants among ART clients with unsuppressed VLs in Monze district.

Method

A Cross-sectional study involving 616 HVL ART clients from 15 health facilities in Monze district which was conducted between October 1 2019 and March 30 2021.

Results

Out of 616 clients analysed, there was an improvement in viral load suppression following completion of EAC with a final outcome of 61% suppression. 28.7% remained unsuppressed. A total of 9.1% had no final viral load results documented and 0.2 % had been transferred out of their respective facilities and were not included in the study. Collection of repeat Viral loads was done on 84% of the clients with high viral load results while 16% had no record of sample collection. A total of 56 results were not received giving a result return of 89% from repeat samples collected. Females had a 40% likelihood of being unsuppressed at 95% CI (41% to 86%) compared to the males.

Conclusion

EAC improves the outcomes of HVLs and should be encouraged on all high viral clients. Programs should be developed to improve suppression in females on ART.

138. QUALITY OF CARE OFFERED BY NURSES TRAINED UNDER THE DECENTRALISED MODEL AND THOSE TRAINED

Scientific Abstract (Oral)

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Introduction

Zambia has had a shortage of nurses and midwives spanning from early 2000 and the situation is dire in rural areas, where many young nurses and midwives are reluctant to live. The skill-based shortage is of concern in a healthcare context characterised by global health indicators such as high maternal mortality ratio, high under-five mortality ratio, high HIV prevalence rate, and a life expectancy lower than the global average. In order to address the above challenges, a decentralized placement model in the training of nursing students was introduced at one College of Nursing and Midwifery.

Methods

The aim of this study was to investigate the quality of nursing care provided by graduates from the decentralized training model against the cohort of graduates of the traditional model of Nursing training. The study utilised a cross sectional analytical study design involving 143 nurses who graduated from one College of Nursing offering training through the decentralized model and one College of Nursing offering training using the traditional model. The participants were conveniently selected and in the case where graduates on the list could not be reached, snowball sampling technique was used. Data was collected using a standardised checklist as the candidates performed mandatory procedures. To supplement information obtained from assessment of the candidates, a 5-point Likert scale questionnaire was used to obtain information from their supervisors, on additional aspects of graduates' clinical competences. The data were analysed using the Statistical Package for Social Sciences (SPSS) version 26. Measures of central tendency were used to analyse the data on demographic characteristics of the participants, while Chi square was used to determine the relationship between variables. In addition, independent samples t-test was used to determine the significant differences in means between the two groups.

Results

Results of the t-test show that there was no significant difference on overall knowledge levels between graduate nurses from the decentralized model of nurse training (M = 3.24, SD = 0.93) and the traditional model of nurse training (M = 2.58, SD = 1.07), p = 3.285. In terms of skills, the study highlighted a significant difference in overall skills levels between graduate nurses from the decentralized model of nurse training (M = 23.52, SD = 3.02) and the traditional model of nurse training (M = 21.72, SD = 3.14), p = 0.018. In addition, results indicated a significant difference in overall attitudes towards patient care between nurses trained from the decentralized model of nurse training (M = 23.52, SD = 3.20) and those trained from the traditional model of nurse training (M = 21.73, SD = 3.15), p = 0.017. Comparison of supervisors' rating of graduates overall clinical skills revealed no significant difference in nurses trained under the decentralized model (M = 3.34, SD = 0.88) and those trained under the traditional model (M = 3.21, SD = 0.77), p = 0.119.

Conclusion

From this study, it can be concluded that some specific aspects of knowledge, skills and attitudes of graduate nurses are influenced by the model used in their training. Based on these results, the decentralized model of training can be recommended for scale-up to all nursing and midwifery training institutions.

139. HIVCONSVX: DEVELOPMENT OF A GLOBALLY RELEVANT T-CELL VACCINE AGAINST HIV

Scientific Abstract (Oral)

Kilembe, W.[1], Jaoko, W.[2], Kaleebu, P.[3], Sanders, E.[4], Muturi-Kioi, V.[5], Ciconni, P.[4], and Hanke, T.[4]

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Introduction

T cells clearly impose a selective pressure on HIV and their protective potential should be harnessed if only to complement antibodies. Our aim is to contribute to an effective HIV-1 vaccine by developing a strategy for induction of protective T cells. We advance through iterative improvements of the T-cell vaccine design (immunogen and delivery) informed in part by pre-clinical studies, but by mainly driven by human data.

Methods

The HIV-CORE trials test a candidate T-cell vaccine strategy consisting of a prime with engineered replication-deficient simian (chimpanzee) adenovirus vector ChAdOx1 followed by a heterologous boost with two replication-deficient poxviruses called MVA.

These vectors deliver unique mosaic algorithm-computed immunogens derived from the six most functionally conserved regions of the HIV proteome, collectively called HIVconsvX, whereby two regions are derived from Gag including the whole capsid protein p24 and four are from Pol. Furthermore, their mosaic character achieved a perfect match of potential T-cell epitopes to 80% of HIV group M isolates. Importantly, CD8 T-cell responses to the HIVconsvX regions correlated with high significance to good clinical parameters in Japanese treatment-naïve people living with HIV. If effective, the vaccines could work across all major HIV-1 clades and be deployed in all geographical regions as a component of preventive or cure packages.

Results

HIV-CORE 0052 in Oxford, UK and HIV-CORE 006 at 4 sites in sub-Saharan Africa (in Lusaka, Zambia at Center for Family Health Research in Zambia (CFHRZ), Nairobi, Kenya at Kenya AIDS Vaccine Institutes (KAVI) and in Kilifi at Kenya Medical Research Institute and in Entebbe, Uganda at the Medical Research Center – Uganda Virus Research Institute (MRC-UVRI).) are near completion. The trials have established that the vaccines are safe and induce strong and broad T-cell responses in HIV-negative adults from key populations. Further characterization of vaccine-elicited responses will be presented as well as the current clinical development programme.

Conclusions

Further clinical development of the HIVconsvX vaccines towards prevention and cure is warranted.

140. CRITICAL SUCCESS FACTORS FOR ROUTINE IMMUNIZATION PERFORMANCE: A CASE STUDY OF ZAMBIA 2000 TO 2018

Best Practices Abstract (Oral)

Micek, K.[1], Hester, K.A.[1], Chanda, C.[2], Darwar, R.[1], Dounebaine, B.[1], Ellis, A.S.[1], Keskinocak, P.[3], Abimbola Leslie[4], Manyando, M.[2], Manyando, M.S.[2], Nazzal, D.[5], Ogutu, E.A.[1], Sakas, Z.[1], Castillo-Zunino, F.[5], Kilembe, W.[2], Bednarczyk, R.A.[1], Freeman, M.C.[1], for Vaccine Exemplars Research Consortium

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Introduction

The essential components of a vaccine delivery system are well-documented, but robust evidence on how and why the related processes and implementation strategies prove effective at driving coverage is not well-established. To address this gap, we identified critical success factors associated with advancing key policies and programs that may have led to the substantial changes in routine childhood immunization coverage in Zambia between 2000 and 2018.

Methods

We identified Zambia as an exemplar in the delivery of childhood vaccines through analysis of DTP1 and DTP3 coverage data. Through interviews and focus group discussions at the national and subnational levels, we investigated factors that contributed to high and sustained vaccination coverage. We conducted a thematic analysis through application of implementation science frameworks to

determine critical success factors. We triangulated these findings with quantitative analyses using publicly available data.

Results

The following success factors emerged: 1) the Inter-agency Coordinating Committee was strengthened for long-term engagement which, complemented by the Zambia Immunization Technical Advisory Group, is valued by the government and integrated into national-level decision-making; 2) the Ministry of Health improved the coordination of data collection and review for informed decision-making across all levels; 3) Regional multi-actor committees identified development priorities, strategies, and funding, and iteratively adjusted policies to account for facilitators, barriers, and lessons learned; 4) Vaccine messaging was disseminated through multiple channels, including the media and community leaders, increasing trust in the government by community members; 5) The Zambia Ministry of Health and Churches Health Association of Zambia formalized a long-term organizational relationship to leverage the strengths of faith-based organizations; and 6) Neighborhood Health Committees spearheaded community-driven strategies via community action planning and ultimately strengthened the link between communities and health facilities.

Conclusion

Broader health systems strengthening and strong partnerships between various levels of the government, communities, and external organizations were critical factors that accelerated vaccine coverage in Zambia. These partnerships were leveraged to strengthen the overall health system and healthcare governance.

141. USE OF AN ETEC PROTEOME MICROARRAY TO EVALUATE CROSS-REACTIVITY OF ETVAX® VACCINE-INDUCED IGG ANTIBODIES IN ZAMBIAN CHILDREN

Scientific Abstract (Oral)

Mubanga, C.[1,2], Simuyandi, M.[1], Mwape, K.[1,3], Chibesa, K.[1,4], Chisenga, C.[1], Chilyabanyama, O.N.[1], Randall, A.[5], Liang, X.[5], Glashoff, R.H.[2], and Chilengi, R. [1]

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Introduction

ETEC is a major contributor to diarrhoeal morbidity, especially in very young children in LMICs. The development of a broadly protective vaccine to cover most of the ETEC variants is critical for disease control. The exploratory study reported here, aimed to use the ETEC proteomic array technology to study IgG responses in plasma of children participating in a randomised controlled phase 1 trial for ETVAX® in Zambia to generate hypotheses for further study studies. All the proteins overexpressed in ETVAX® except for CS5, are included on the array as purified proteins. Our study evaluated whether ETVAX®-induced IgG antibodies are cross-reactive against ETEC antigens that are absent from the ETVAX® vaccine

Methods

We evaluated 40 (pre-and post-vaccination) plasma samples from 20 children aged 10-23 months from Zambia. These participated in a single site, double-blind, placebo-controlled, age-descending phase 1 trial investigating the safety, tolerability, and immunogenicity of an oral inactivated ETEC Vaccine (ETVAX®) adjuvanted with dmLT. The trial was conducted between October 2019 and October 2020 in Lusaka Zambia at the Matero clinical research site. Four children were from the placebo group while 16 were from the vaccine group, of which 8 received a 1/4 dose and 8 received a 1/8 dose of the adult vaccine dose. We assessed IgG reactivity to over 4000 ETEC antigens and proteins using a proteome microarray panel.

Results

This is the first study to evaluate samples from young children from an ETEC endemic area using the ETEC proteome microarray. Baseline samples revealed high IgG responses to a variety of ETEC proteins including classical ETEC antigens (CFs and LT) and non-classical antigens such as putative

antigen 43 precursor, conserved hypothetical proteins, putative transmembrane proteins, adhesin autotransporter, peptidoglycan associated lipoprotein, putative flagellin (Flic H11), metalloprotease YghJ and secreted proteins EtpA and EatA. Post-vaccination, reactivity to CFA/1, CS3, CS6, and LTB was stronger than baseline among the vaccinated compared to the placebo group. The CS5 protein was not included in the microarray. Three other purified non-vaccine ETEC proteins; CS4, CS14, and PCF071 had significantly higher post-vaccination responses.

Conclusions

We conclude that ETVAX® induces cross-reactive IgG antibody responses to non-vaccine CFs CS4, CS14, and PCF071 from the class 5 fimbriae. This activity could provide some broad IgG antibody coverage beyond the core vaccine antigens themselves. We have also shown that various other proteins are involved in ETEC pathogenesis and may be investigated for their role in protection.

142. A COMMUNITY-BASED EVALUATION OF ORPHANS AND VULNERABLE CHILDREN AFFECTED BY HIV

Scientific Abstract (Oral)

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Introduction

From 2015 to 2021, the University of Houston and Macha Research Trust conducted a longitudinal study of orphans and vulnerable children affected by HIV (OVCs) in Southern Province, Zambia, funded by the National Institutes of Health in the US. The aim of the study was to identify and evaluate all medical, psychological, social and educational interventions being delivered for free to OVCs in the region.

Methods

Representative villages within a 20-kilometer radius of the Macha Mission Hospital were approached by trained field personnel and households (n = 4,702) were screened for OVCs using an adaptation of the Multiple Indicators Cluster Survey. Households were invited to participate in the study if any children/youth aged 6 to 18 years old met at least one of the following criteria: (a) HIV positive status; (b) having at least one HIV positive parent; (c) having at least one parent who died of HIV/AIDS; or (d) having a primary caregiver diagnosed with HIV. Subsequently, 1,194 OVCs were enrolled in the study. Each OVC was assessed for cognitive, academic, physical, and social-emotional indicators at three timepoints approximately 1 year apart. In addition, caregivers were asked to report on any free services or supports that these children had received during the past year. Based on these reports, medical support was provided primarily by the local hospital and rural health clinics. Emotional and psychological support was mostly provided by churches. Social support (material support and money) was provided by different types of organizations, mostly NGOs and churches. Educational support was mostly provided by schools.

Results

Analyses of the data have indicated that only a small percentage of our participating OVCs reported receiving any free services (30%) at our first visit. This proportion tended to decrease each year in every category except for medical services. Using regression analyses, we examined the association between children's receipt of various services with their educational outcomes, specifically, their progress in reading and mathematics. Preliminary quantitative findings indicate both concurrent and long-term associations between having received educational and psychological interventions and academic performance. Specifically, receiving educational services at Time 1 was associated with math performance at Time 1 (β = 0.10, %95 CI = [0.01, 0.19]) and Time 3 (β = 0.10, %95 CI = [0.01, 0.18]). Receiving psychological services at Time 1 was associated with math performance at Time 1 (β = 0.12, %95 CI = [0.02, 0.22]), early reading skills at Time 1 (β = 0.17, %95 CI = [0.07, 0.27]) and reading comprehension at Time 2 (β = 0.10, %95 CI = [0.00, 0.21]). Qualitative analyses of interviews conducted with service-providing organizations help explain some of these results through descriptions of challenges faced by each organization. These included lack of training to counsel HIV OVCs, difficulty in identifying HIV OVCs when families are reluctant to disclose HIV statuses, and lack of consistent funding to provide ongoing services.

Conclusion

These findings have implications for the types of interventions that might be scaled up to improve OVC outcomes in the future.

143. PREVALENCE OF DIARRHEAGENIC BACTERIAL AND, RESPECTIVE CO-INFECTIONS AMONG CHILDREN BETWEEN 0-36 MONTHS OLD IN PERI-URBAN AREAS OF LUSAKA BETWEEN 2020 AND 2021

Scientific Abstract (Oral)

Mwape, K[1]., Simuyandi, M[1]., Chilyabanyama, O[1]., Phiri, B[1]., Chibesa, K[1]., Silwamba S[1]., Luchen C[1]., Sukwa, N[1]., Mubanga, C[1]., Chibuye, M[1]., Somwe, P[1]., Liswaniso, F[1]., Chisenga, C. C[1]., Bosomprah, S[1]., Muyoyeta, M[1]., Barnard, T.[2] and Chilengi, R.[1]

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Introduction

Diarrhoea remains a major yet preventable public health threat in low-to-middle income countries (LMICs) with children under five years of age bearing the highest burden due to poor water and sanitation conditions. It is estimated that children between 0 to 36 months, suffer from at least three episodes of diarrhoea annually in LMICs. While efforts have been made to describe the most significant aetiologic agents of diarrhoea in these settings, a significant proportion of diarrhoeal episodes have been reported to have mixed aetiologies. A hospital-based study in Zambia conducted just at the introduction of oral rotavirus vaccination reported bacteria among top aetiologic agents second to rotavirus. Given the reduction of rotavirus related severe GE post-vaccine introduction, understanding the bacterial aetiology of diarrhoea in both hospitalised and outpatient settings is critical for informing control and prevention programs. We report the burden of bacterial pathogens among children presenting at health facilities with moderate to severe diarrhoea (≥3 loose stools in 24hrs) using the Novodiag BGE+ platform which targets 13 enteric bacteria(i.e., enteropathogenic E. coli(EPEC), enterotoxigenic E. coli(ETEC), enteroaggregative E. coli(EAEC), enteroinvasive E. coli (EIEC)/Shigella spp., enterohaemorrhagic E. coli(EHEC), Campylobacter coli, Campylobacter jejuni,

Clostridium difficile, Salmonella spp., Yersinia enterocolitica, Vibrio cholerae, Vibrio poarahaemolyticus and Yersinia pseudotuberculosis/pestis).

Method

This cross-sectional study was nested on the ETEC surveillance cohort study which was aimed at determining the incidence of ETEC among children under the age of three.

Demographic and clinical data collection: Clinical and demographic information was collected from participants using a diarrhoea case form with variables to determine diarrhoea severity scores across key scores (DHAKA and WHO).

Sample collection and processing: Stool was collected in sterile containers and transferred to a lysis buffer using a swab. It was tested on the Novodiag bacterial GE+ according to the manufacturer's instructions.

Bacterial pathogens detection: The novodiag uses both real-time PCR and microarray technology to produce qualitative results for each bacteria.

Results

Of the 860 samples, enteric bacteria were detected in 83%(n=716) samples. The top three bacterial pathogens were diarrhoeagenic E. coli (i. e., EPEC (45%), EAEC(39%) and ETEC (29%). These were followed by Campylobacter coli(23%), Shigella/EIEC(19%) and Campylobacter jejuni(130%). Single infections accounted for 37%(268/716) while co-infection of at least two pathogens present in the same stool sample was 448/716(63%). About 10% (70/716) had at least four pathogens detected in one sample. When stratified by age, children under 12 months accounted for 321/860(36%) of the diarrhoea cases, with EAEC being significantly higher in this age group (P-value <0.001). Enterotoxigenic E. coli and Shigella/EIEC were significantly higher in the 12-23 months age group.

Conclusion

Diarrheagenic E. coli were the most prevalent pathogens detected, often occurring in combination with other pathogens (i)EPEC + Campylobacter coli (ii)Shigella/EIEC + Campylobacter jejuni + EAEC and (iii)ETEC + Campylobacter coli + EAEC + EPEC. The early exposure to DEC (i.e., <12months) shown in this study warrants further investigation in terms of its impact on EED,

children's growth velocity, and other sequelae associated with early and repeated exposure to these pathogens.

144. PERCEIVED QUALITY OF CARE AND SATISFACTION AMONG PATIENTS ENROLLED IN DIFFERENTIATED SERVICE DELIVERY MODELS AND STANDARD OF CARE IN ZAMBIA: A MIXED METHODS STUDY

Scientific Abstract (Oral)

Phiri, B[1]., Mwenechanya, M.M[2]., Mulenga, P.L[3]., Kaiser, J.L., Haimbe, P[4]., Shakwelele, H[1]., Mokhele, I[5].,Huber, A[5]., Pascoe, S[5] and Rosen, S[4].

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Introduction

Differentiated service delivery (DSD) is a patient-centered approach that aims to improve patient outcomes, including quality of care and satisfaction. Zambia, among other countries in sub-Saharan Africa, has been implementing DSD models for HIV treatment since 2016. There is little evidence of patients' experiences in DSD models compared to standard of care (SoC), however.

Methods

We surveyed patients ≥18 years between April-October 2021 at 12 health facilities in Lusaka and Central Provinces, Zambia. Participants were selected and recruited during facility visits. Eligible patients were active on ART for ≥6 months and enrolled either in a DSD model (6 multi-month dispensing [6MMD], community-based DSD models [CBDM], and facility-based DSD models

[FBDM]), or in SoC (which included some eligible for enrollment in DSD) and had received at least one medication refill in this model. A structured questionnaire with quantitative and qualitative questions was administered to assess patients' perceived quality of care (QOC) and satisfaction. Ten questions asked about aspects of QOC, including provider attitudes, trust in the provider, and time spent with provider. Each question used a 5-point Likert scale ranging from one (strongly disagree) to five (strongly agree) (Cronbach's alpha = 0.7). Mean scores were categorized as "low" QOC (score ≤3) or "high" QOC (score >3). Overall satisfaction with HIV care was assessed with a 5-point Likert scale ranging from one (extremely dissatisfied) to five (very satisfied). Satisfaction score was categorized as either not satisfied (score ≤3) or satisfied (score >3). We present proportions for those enrolled in each DSD model and in SoC. Major qualitative themes arising from satisfied and dissatisfied patients were analyzed by model.

Results

A total of 558 patients were surveyed; 390 (70%) were in DSD models and 168 (30%) in SoC. Almost all patients (99.5%) perceived high QOC regardless of model. DSD model patients reported slightly higher satisfaction levels than did those in SoC (98.3% on 6MMD, 96% on CBM, 93.1% on FBM, 87.9% SoC eligible for DSD, and 83.3% SoC not eligible for DSD). Patients in DSD models expressed satisfaction due to time saved by being in the models, allowing them to attend to other activities, such as farming, piecework, or rest. Many associated their additional time to more months of ART medication dispensed, requiring fewer clinics visits in a year. Those in SoC related their satisfaction primarily to providers' attitudes, disposition, and helpfulness, describing them as friendly, welcoming, and respectful. The few who reported dissatisfaction cited long waits at facilities (SoC) and those in DSD models cited shorter dispensing intervals (1.7% SoC not eligible for DSD, 12.1% SoC eligible for DSD, 1.7% on 6MMD, 4% on CBDM, and 6.9% on FBDM).

Conclusion

The majority of HIV treatment patients perceived high quality of care and satisfaction. While quality of care was perceived similarly across DSD models and SoC, patient satisfaction was slightly higher in those enrolled in DSD models compared to those in SoC. DSD models are a promising method to decongest busy ART clinics, while maintaining high quality of care and patient satisfaction.

145. CROSS-REACTIVITY OF THE ETVAX® VACCINE-INDUCED ANTIBODIES TO DIARRHOEAGENIC ESCHERICHIA COLI SPECIFIC ANTIGENS: A MICROARRAY ANALYSIS

Scientific Abstract (Oral)

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Introduction

Diarrhoeagenic E. coli (DEC) have been identified as a key contributor to the burden of diarrhoea among children. Belonging to the same species, molecular conformations of some antigenic proteins may be conserved across the DEC pathotypes. Thus, a vaccine developed against one pathotype may elicit immune cross-reactive responses to other pathotypes. Although there is no licensed vaccine against DEC, several vaccines against the enterotoxigenic E. coli (ETEC) pathotype are in advanced developmental stages (i.e., ETVAX phase IIb, FTA phase I/IIb and ACE527 live attenuated phase II). The ETVAX® vaccine is scheduled for a phase III trial placing it as the most advanced ETEC vaccine at present. If ETVAX® can elicit cross-protection across DEC, the additional benefit of introducing the ETVAX® vaccine when licensed would drive country uptake, especially in areas endemic to DEC. This study was aimed at exploring the cross-reactivity of ETVAX® vaccine-induced antibodies against proteins derived from other DEC using the E coli microarray by ADI. This data is of great value in LMICs where enteric diseases remain a huge burden and vaccination offers the only tangible hope for public health mitigation.

Methods

Study design: A nested study of 20 children aged between 10-23 months participating in the phase 1b dose-finding RCT of the ETVAX® vaccine. Participants received varying doses of the vaccine; four placebo, eight 1/8th and eight ¼ vaccine dose.

Sample collection and processing: Blood samples were collected over a 97-day period at two time points; pre-vaccination and 7 days post third dose. Plasma samples were evaluated for IgG response to DEC proteins using the GenePix 4300 microarray scanner.

Data analysis: antigens were categorised as reactive if at least one sample was seropositive (signal ≥1.0). We performed paired t-tests of pre- and post-vaccination samples to assess the vaccination effect in each treatment group separately and independent t-tests to assess differences between groups.

Results

We profiled the top 20 most reactive proteins across all samples, proteins with the highest intensities in IgG reactivity were EHEC and EPEC proteins; Tir, EspB and SseC-like family proteins. The reactivity among individual participants from different vaccination groups revealed a proportionate increase with the increase in vaccine dosage (i.e from placebo to ¼ of the adult dose). In the vaccinated group, the EIEC-derived proteins Ipa comprised most of the top reactive proteins with reactivity intensity being higher after the third dose of vaccination.

Conclusion

We observed a dose-response trend to IpaH, SseC, and EspB proteins which are not overexpressed in the vaccine strains indicating some non-intended induced response. An important note is the proteins with the highest IgG reactivity in our study are known to have a critical role in the pathogenesis of EIEC, EHEC and EPEC. We conclude, therefore, that the scope of protection offered by the ETVAX® may extend to these pathotypes. Further analysis of samples from all clinical trials of ETVAX as well as checking for homology between proteins that had high reactivity against those in the etvax vaccine would provide more insight into this observation.

146. DOES THE EFFECT OF ECONOMIC SUPPORT AND COMMUNITY DIALOGUE ON EDUCATIONAL OUTCOMES DEPEND ON THE AVAILABILITY OF SANITATION AND MENSTRUAL HYGIENE AMONG ADOLESCENT GIRLS IN RURAL ZAMBIA?

Scientific Abstract (Oral)

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Introduction

Lack of facilities and resources to manage menstrual hygiene at school are among numerous factors that are cited as barriers to girls' education, in addition to poverty, early pregnancy and marriage, and social norms that discourage girls from completing school. Economic support to reduce financial barriers, community dialogue and comprehensive sexuality education (CSE) have been seen as promising interventions to improve grade 8 and 9 school attendance and the probability of passing grade 9 examinations. The purpose of the study was to find out whether the effectiveness of these interventions varied with availability of sanitary facilities and materials for menstrual hygiene management.

Methods

A three-arm cluster randomised controlled trial was conducted in Zambia, enrolling girls (aged 10 to 25 years) in grade 7 in 2016 from 12 study districts (Kalomo, Choma, Pemba, Monze, Mazabuka, Chikankata, Chisamba, Chibombo, Kabwe, Kapiri Mposhi, Mkushi and Luano.The interventions were implemented between September 2016 and November 2018, with biannual follow-ups until 2020. In addition to the control arm, the study included an economic support arm that offered adolescent girls payment of school fees, monthly stipends, and annual grants to parents. The combined arm offered both economic support and community dialogue and comprehensive sexuality education (CSE). We analysed the interaction between the availability of sanitary facilities and materials for menstrual

hygiene management with study interventions on school outcomes on an additive scale using the absolute excess risk due to interaction (AERI).

Results

There was a moderately negative interaction between the availability of usable toilets with economic support on grade 9 school attendance (AERI -0.16;95% CI -0.38-0.06) and on passing grade 9 examinations (AERI-0.10;95% CI -0.23-0.04) with the effects being stronger in schools where toilets were not in usable condition. There was possibly a slight negative interaction between non-availability of usable toilets and the addition of community dialogue and CSE versus economic support (AERI -0.08;95% CI -0.19-0.03) on grade 8 attendance with the effects being stronger in schools where toilets were not usable.

There was a moderately negative interaction, on an additive scale, between availability of menstrual hygiene materials with the addition of community dialogue and CSE versus economic support alone on passing grade 9 examinations (AERI -0.10;95% CI -0.02-0.22) with effects being stronger in schools where sanitary materials were not provided.

Conclusion

The effects of economic support and the addition of community dialogue and CSE appeared stronger in schools without usable toilets and without the availability of sanitary materials, respectively, probably because the support boosted the motivation to succeed in school among participants who were enrolled in schools with poor sanitary conditions.


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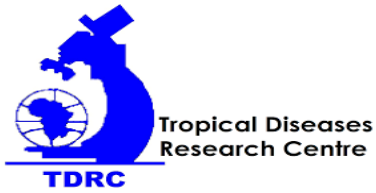
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