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CONFERENCE PROCEEDINGS

The 31st Annual Joint Scientific Conference of the National Institute for Medical Research (NIMR)

17th-19th May 2022

A Multisectoral Approach for Health: an Agenda for Health Systems Strengthening Towards Achieving Universal Health Coverage

Sub-themes

1. Health challenges due to environmental and climate change
2. Non-communicable diseases
3. Nutrition, reproductive, maternal, neonatal, child and adolescent health
4. Neglected tropical diseases and emerging and re-emerging infectious diseases
5. Health care financing
6. Traditional and alternative medicine
7. Health systems strengthening
8. Innovation and health technologies
9. Infectious diseases and antimicrobial resistance

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CONFERENCE PROCEEDINGS: 31st Annual Joint Scientific Conference of the National Institute for Medical Research, 17th-19th May 2022.

THEME: *Multi-sectoral Approach for Health: An Agenda for Health Systems Strengthening Towards Achieving Universal Health Coverage.*

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Abstract

The National Institute for Medical Research (NIMR) was established under the Parliament of the United Republic of Tanzania Act of 1979 (Cap.59. R.E. 2002) and became operational in 1980. It is mandated among other functions, to establish and operate systems of documentation and dissemination of information on any aspect of the medical research carried out by or on behalf of the institute. Since 1982, the Annual Joint Scientific Conference (AJSC) has been an important platform where researchers, policymakers, practitioners, development partners, media and any other health research stakeholders discuss, and deliberate evidence generated from diverse research conducted across the world.

Objectives: The AJSC objectives have always been to; (i) promote health research for sustainable socio-economic development in Tanzania and Sub-Sahara Africa; (ii) share findings of health research with key stakeholders and the general public; and (iii) discuss and explore new health research and service priority areas.

The 31st Annual Joint Scientific Conference: It was held from 17th to 19th May 2022 at Julius Nyerere International Convention Center (JNICC) in Dar es Salaam and Hon. Isidor Phillipo Mpango, Vice President, United Republic of Tanzania graced its opening ceremony. The main theme of the Conference was *"A Multisectoral Approach for Health: An Agenda for Health Systems Strengthening Towards Achieving Universal Health Coverage*." The conference had nine sub-themes namely non-communicable disease, neglected tropical diseases, emerging and re-emerging infectious diseases, health systems strengthening and health care financing, nutrition, reproductive, maternal, neonatal, child and adolescent health, traditional and alternative medicine, Innovations and health technology, Infectious diseases and anti-microbial resistance and cross-cutting health issues. There were Oral and poster presentations, symposia and round table discussions, dissemination sessions on malaria molecular surveillance and the launch of the Genomics laboratory at NIMR headquarters. The Conference generated evidences and action-oriented recommendations to aid the general practices, assist in formulating policies and provide guidance to disease control programs in subsequent years.

Keywords: NIMR, AJSC, Health, Research, *Multisectoral*, Universal, coverage, conference

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C*hapter 1:* NIMR Annual Joint Scientific Conference

NIMR was established under the Parliament of the United Republic of Tanzania Act of 1979 (Cap.59. R.E. 2002) and became operational in 1980. It is mandated among other functions, to establish and operate systems of documentation and dissemination of information of the evidence generated through various research implemented in the county.

The Annual Joint Scientific Conference started in 1982 to fulfil the NIMR mandates with the following objectives (i) promote health research for sustainable socio-economic development in Tanzania and Sub-Sahara Africa; (ii) share findings of health research with key stakeholders and the general public; and (iii) discuss and explore new health research and service priority areas.

The AJSC has proven to be the avenue for NIMR-visibility-nationally, regionally, and internationally. It has fostered debate among different partners on different emerging issues, hence more improvement in health research systems and health delivery services.

As for policy implications, the conference has provided a good forum for the exchange of research information to policymakers, media, and the public at large. It has influenced shreds of policy making and changes based on evidence-based research findings. From each conference, recommendations have been submitted to the Government through the Ministry of Health and other stakeholders for implementation.

The **31st Annual Joint Scientific Conference** was held from 17th to 19th May 2022 at JNICC in Dar es Salaam. The main theme was ***"A Multisectoral Approach for Health: An Agenda for Health Systems Strengthening Towards Achieving Universal Health Coverage."*** The theme was appropriate as Tanzania reiterates to achieve Universal Health Coverage, it reflected the fact that access to all the necessary health services, anytime and anywhere, requires integrated sectoral plans. There is a need of strengthening the countries' health systems `while also improving the coordination of Health system strengthening efforts.

Nine major subthemes were:

1. Addressing health challenges due to environmental and climate change,
2. Non-communicable disease,
3. Neglected tropical diseases,
4. Emerging and re-emerging infectious diseases,
5. Health systems strengthening and health care financing,
6. Nutrition, reproductive, maternal, neonatal, child and adolescent health.
7. Traditional and alternative medicine,
8. Innovations and health technology,
9. Infectious diseases and anti-microbial resistance
10. Cross-cutting health issues.

Six symposia and one round table discussion included:

1. Malaria preventive therapies
2. Maximizing the benefits and minimizing the harm of COVID-19 control measures
3. Health promotion and system strengthening
4. Strengthening clinical research oversight and pharmacovigilance capacities in Tanzania
5. East Africa network on malaria molecular surveillance
6. WHO Roadmap 2021-2030 for ending NTDs
7. Round table discussion on 'Integrating management of Chronic Respiratory Diseases into the health systems'

There was also a plenary session on the malaria molecular surveillance project with participants from Ghana, Senegal, Kenya, USA, CHMTs, RHMTs, and district and regional malaria focal person from all regions in the country.

Exhibition and health-related activities

There were exhibitions from within NIMR and outside NIMR.

1. NIMR Centres (Tanga, Amani, Mbeya, Muhimbili, Mabibo, HQ and Tabora)
2. National Microfinance Bank
3. Health Promotion System Strengthening in Tanzania
4. MEDIPIECE
5. IFHI (Integrated Financial Holdings Inc)
6. SCIEX LTD
7. SUAPOPO RESEARCH PROJECT
8. Health Promotion and System Strengthening (HPSS)

Keynote address

The keynote address was given by Dr Andrew Kitua, NIMR Council Chairman and former Director General. The address covered reflections on a "*Multi-sectoral Approach for Health: An Agenda for Health Systems Strengthening Towards Achieving Universal Health Coverage.*" He described the health system using an analogy of a house with the roof as the community, the health system as the structure of the house and the owners and the house as the public and private sectors. Rain was depicted as diseases and ill health.

He reiterated that the current health system is only looking at mopping up the floor instead of fixing the leaking roof. He further explained that the disease epidemiology has shifted from being a triad of agent, host and environment to a more complex aetiology that involves to a great extent social and economic determinants.

He further emphasized that the diseases that we face today can to a great extent be prevented if we shift our attention to fixing the leaking roof by empowering and engaging the community. An emphasis was also made to strengthen the structure of the house to strengthen the health system including universal access to high-quality health services including well-trained health workers, available safe treatments, access to medicines and vaccines and advocacy to users on where and when to access the services.

The above address was braced by the following reflections:

1. The first was provided by Dr. Grace Magembe, Deputy Permanent Secretary (Health) at the President's Office- Regional Administration and Local Government. She reflected on ***"The experience of the President's Office of Regional Administration and Local Government (PORALG) in transforming the health system to achieve universal health coverage in Tanzania"*** The highlights made included; a description of the full spectrum of essential health services, promotion of prevention treatment rehabilitation and palliative care, accessibility to all services that constitute Universal Health Coverage that requires competent human resources and the status of the rehabilitation and construction of health facilities in Tanzania to ensure that the provision of health five kilometres is according to the standards set by the Ministry of Health.
2. Prof. Kaushik Ramaiya from the Tanzania Noncommunicable Diseases Alliance (TANCDA) gave the second reflection, and he reflected on ***"The growing burden of non-communicable diseases (NCDs), and the need to re-orient the health care system: prevention, multisectoral action, financing and access to health services."*** *He* summarised the spectrum of NCDs in low and middle-income countries which consists of 80% of the global burden of disease. He further noted that an

increasing prevalence in the African region is driven by an unhealthy diet, lack of physical activities, smoking, excessive alcohol use and other environmental factors driving the NCD epidemic. NCDs have economic consequences at the patient, family and national levels and gave data-based evidence from a study in Tanzania which looked at NCD comorbidity, that showed that 94% of the patients had two comorbidities and indicated that household expenditure increased with an increasing number of co-morbidities, increasing the risk of catastrophic expenditures. He insisted that the success in managing the NCDs calls for a need for a multisectoral approach at all levels and shifting focus to more preventive than curative approaches. It is also important to use the lessons earned from implementing the HIV program, which uses Community Health Workers for patient empowerment in terms of resources, standardization, and proper monitoring.

3. The third reflection was given by Dr. Catherine Joachim from the Ministry of Health and focused on ***"How Health Sector Strategic Plan V integrates the Universal Health Coverage".*** She noted that the Ministry of Health is implementing the Health Sector Strategic Plan (HSSP) V which will run for a period of five years from 2021-2026. The priorities in the plan are: protecting the population against disease emergencies and ensuring increased resilience is another priority area and ensuring well-being and health, the strategy focuses beyond health, through health in all policies and strengthening engagement of other sectors. She also noted that to achieve UHC, the Government needs to increase the domestic funding because external funding is going to be reduced and emphasised a need to review the health financing strategy and by strengthening the health financing system, with reference to the planned implementation of universal mandatory health insurance.
4. The fourth reflection was *given* by Ms Joy Phumaphi, Executive Secretary, of the African Leaders Malaria Alliance (ALMA). She focused **on *"Multi-sectoral engagement and resource mobilisation for malaria elimination in Africa where African Leaders' Malaria Alliance, a coalition of all the African heads of state and government are working to eliminate malaria on the African continent"*** This initiative was founded by His Excellency former president Jakaya Mrisho Kikwete. It details malaria data as a burden in the African continent and yet the disease, all for an effective multi-sectoral health system requires innovation and multi-stakeholder commitment today. ALMA has also been advocating for data-driven decision-making, transparency, accountability and action on malaria, child and maternal health, NTDs and nutrition and has developed scorecards which provide data on communities, country and regional levels. The councils use national district and community scorecards which are informed by data. ALMA recommends a need to mobilise countries through budget allocation processes across the African continent to eliminate malaria through this multi-sectoral engagement and approach.

Opening speech.

The Vice President of the United Republic of Tanzania, Dr. Philip Isidor Mpango, officiated the opening of the 31st Annual Joint Scientific Conference of the National Institute for Medical Research.

He called for a vast array of strategies to ensure the achievement of Universal Health Coverage based on the fact that Tanzania has taken several steps aimed at bringing health care services closer to the people and achieving healthcare access for all Tanzanians. Among the measures in place is a new funding strategy for the health sector focusing on improving the health insurance scheme, expanding the scope of health insurance and encouraging citizens to join health insurance schemes to ensure that every citizen receives appropriate and timely health care.

Participants were made aware of the Government's focus on financial risk protection, improving access to quality health care services and essential, safe and affordable medicines and vaccines for all, in line with SDG 3. However, with all these efforts there are challenges affecting the

pace of implementation are still many. For example, available information shows that Tanzania and many other African countries still have limited capacities to identify emerging variants of viruses/disease outbreaks as well as those transmitted from animals or caused by industrial/air pollution and how to deal with them. Lack or shortage of vaccines, medicines, medical equipment and skilled health care workers remains characteristic of most of our countries in the region, aggravated by inadequate financing.

He designated the wish of the Government of Tanzania to continue supporting the development and execution of innovative medical and scientific research to bolster quality and more effective health care delivery. As the Government is very much aware that NIMR houses the Health Research Trust Fund which supports research in priority health areas, he confirmed the wish of the Government's commitment to supporting the Fund. And that there should be deliberations on how other stakeholders can support this Fund to scale up health-related research that focuses on our priorities as a country. He called and urged urge the private sector to contribute to funding health research in Tanzania more sustainably.

He further commended the excellent work that NIMR has been pioneering on evidence-based health research in Tanzania to enhance disease management, prevention and control since it was established in 1979. Among the vivid example he pointed out was the role of NIMR during the COVID-19 pandemic where NIMR collaborated and coordinated to advance the use of traditional medicines that lessen the hazards of the pandemic. He urged that the progress made in developing NIMRCAF should not stop with the coronavirus outbreak as there is still a lot more to explore.

As the Government continues to campaign for environmental conservation and tree planting, including medicinal plants and fruit trees, he advised NIMR to scale up research on local herbal remedies known in each district of our country and strive to produce homemade quality medicines and vaccines. He applauded NIMR for creating several scientific awards to motivate and recognize talents, including the Maria Kamm Best Female Scientist Award and more recently the Mwelecele Malecela Memorial award. He extended congratulations in advance of the award-giving ceremony to all those researchers who were recognised and awarded.

Research scientific awards and recipients

These awards are among the highest honours for scientific achievement by health researchers in Tanzania. A Selection Committee scrutinised the top nominees before decisions were made. These awards are in six categories:

1. **The national best health scientist award** recognises scientific excellence for researchers who have contributed substantially to health research. Nominated scientists are those who received majority voting from Tanzania researchers in an open online competition. The recipient of this award was Professor Sayoki Godfrey Mrinde Mfinanga of the National Institute for Medical Research, Muhimbili Research Centre.
2. **The national lifetime achievement award in health research** recognises the contribution of scientists who have retired but made substantial contributions to health research and continue to do so throughout their lifetime. The recipient of this award was Professor Japhet Zebedayo Killewo of Muhimbili University of Health and Allied Sciences.
3. **The national health innovation award** recognises a Tanzanian scientist who has made a significant contribution through the development of a high-impact health innovation that has the potential to improve the health and well-being of our population and beyond. The recipient of this award was Mr. Franc Mussa of Muhimbili University of Health and Allied Sciences.
4. **Dr. Maria Kamm best female scientist award** recognises an outstanding female scientist that has made a significant scientific contribution to research and capacity building across the

country. The awardee had at least five peer-reviewed publications (as first author/last author) in the past five years, contributed to capacity building of upcoming research scientists through training and mentorship and has contributed to the dissemination and translation of research evidence. The recipient of this award was Doctor Stella George Mpagama of Kibong`oto Infectious Diseases Hospital.

5. **The NIMR best scientist award** recognises a Research scientist of the National Institute for Medical Research who has at least four Journal publications in the year of review, has won Grants/Consultations in the year under review 2021/22 and research conducted has informed practice and policy changes. The recipient of this award was Doctor Jacklin Franklin Mosha of NIMR Mwanza Research Centre.
6. **Dr. Mwelecele Malecela memorial award** is a new award introduced in memorial of the 3rd NIMR Director General, the late Dr. Mwelecele Malecela. The award recognises Early Career Researchers in health. The awardee is aged 40 years or below at the time of award, has less than ten years in health research and has at least three papers published in peer review journals. The awardee had presented their work at scientific conferences at least once and developed or participated in developing at least two fundable proposals. The recipient of this award was Doctor Anange Fred Lwilla of NIMR Mbeya Research Centre.

Closing remarks

The Chief Medical Officer graced the closing ceremony of the AJSC by congratulating all presenters, exhibitors and participants during the Conference. He informed participants on the Government's steps and multi-sectoral deliberations to make health care services available to their populations regardless of their financial situations. And this is in line with the conference theme, "*A Multi-sectoral Approach for Health: An Agenda for Health Systems Strengthening towards Achieving Universal Health Coverage*".

He pointed out that achieving universal health coverage (UHC) is one of the overarching targets of the 2030 agenda for sustainable development, under goal 3 (Ensure healthy lives and promote well-being for all ages). He called upon all stakeholders to play important roles in the implementation to ensure that the goals of the UHC are met. He further urged NIMR to ensure that it exercises its mandate and most importantly ensure that it disseminates research findings to the fullest; use these conferences and other fora to relay proper health messages in a language that can be grasped even by lay persons.

As the conference had attracted participants from different parts of the globe, he challenged NIMR to use and seize the opportunity, to acquire the various new technologies that were described and exhibited. To the media, he hinted that this is the time to get in touch with the experts in the field of health and acquire the basics of the various disciplines in order to ensure the transmission of correct messages to the people. The importance of the media in health education cannot be overemphasised here. Neither is the damage arising out of relaying false messages.

CHAPTER 2: Conference abstracts by sub-themes

1. Health challenges due to environmental and climate change

Climate change and its consequences are the crises that could compromise the gains in achieving global health security, impact development and poverty reduction efforts and health inequalities. Evidence from studies informs the impacts of several climate-sensitive health risks and estimates of increased morbidity and mortality to global warming (UNFCC 2022). They include increases in zoonoses, food and water and vector-borne diseases, and mental health issues.

Vector-borne disease infections are a major concern in tropical regions and their distribution is influenced by climate and climate change. There is increasing evidence that the pattern and pathogenicity of viruses, bacteria, protozoa, and helminths are influenced by climate change (Joacim et al, 2020). Extreme weather patterns such as droughts concentrate pathogens and contamination of water sources may influence the geographical spread due to increased precipitation, storm surges, and sea temperatures. These environmental factors contribute to flooding and runoff that can spread sewage, toxicants, and disease pathogens.

Participants deliberated on research findings on the environment and climate change and their effects on the social, climatic, and ecological determinants of health, community vulnerability, and proposed interventions and mitigation measures to avert the health risks.

ECC1: Menstrual Health and Hygiene Knowledge among Post Menarche Adolescent School Girls in Urban and Rural Tanzania

Presenting author: Robert Njee [1]*
Co-authors: Calister P. Imeda, Said M. Ali, Adiel K. Mushi, Doris D. Mbata[1], Albert Kapala, Emmanuel A. Makundi[1], Vitus A. Nyigo, Albert M. Majura, Winfrida Onesmo, Yolanda Mbatia[1], Germana Baraka, Judith Msovela[1], Ester Ngadaya[1], Mbazi Senkoro[1], Hamisi M. Malebo[1]
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Background: Lack of knowledge about menstruation and requirements for its hygienic management has limited adolescent girl's ability to enjoy healthy life and impaired learning. Schools in Africa South of Sahara are characterized by absence of enabling infrastructure, inappropriate menstrual materials, and limited socio-support for good menstrual health and hygiene. We assessed menstrual hygiene knowledge among school adolescent girls and identify bottlenecks that are relevant to policy and programming for menstrual health and hygiene.
Methods: A community-based cross-sectional study was conducted from April to September 2019 covering 8,012 adolescent schoolgirls in the age group of 11–18 years (mean age = 14.9years). The study employed a combination of qualitative and quantitative methods to assess knowledge regarding menstrual health and hygiene (MHH) from school and community perspectives. Data was collected using self-administered questionnaires, Focus Group Discussions, In-depth Interviews, and Site observations.
Results: Menstrual hygiene knowledge was positively associated with girls' age (AOR = 1.62, P < 0.001), having a female guardian (AOR = 1.39: P = 001), and having a formally employed parent (AOR = 1.03: P. 0.023). MHH knowledge levels were comparable between girls from rural schools and urban schools, yet they varied significantly between those in government (53.3) and non-government schools (50.5%, P = 0.0001). Only 21% of study schools had at least one teacher trained in MHH teaching for school children.

Conclusion: We have confirmed that majority of school adolescent girls are uninformed about menstrual health and hygiene, and that schoolteachers lack the necessary skills to equip and support young adolescents through pubertal transition. Concerted actions targeting supportive policy are paramount to improve knowledge and enhance the long-term benefits of good menstrual health practices for school adolescents.

ECC2: Children's Air Pollution Profiles in Kilimanjaro, Tanzania

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Co-authors: Blandina Theophil Mmbaga[1], James Samwel Ngocho[1], Bibie Said[2], Ronald Mbwasi[1]
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Background: There is an increase in the burden of human disease referable to ambient air pollution in sub-Saharan Africa and yet estimates of its impact on the region are possibly underestimated due to a lack of air quality monitoring. Personal monitoring is now becoming popular both
as a research tool and from a health promotion perspective. We aimed to collect and analyse personal air pollution exposure data, activity profiles, and lung function measurements for school children in the Kilimanjaro region, Tanzania.
Methods: Primary school children aged 12 to 16 years identified to have asthma symptoms in the previous 12 months through the ACACIA Breathing Survey were recruited. Children were enrolled in 5 primary schools in Moshi Municipality. Following parental consent, the participant was given a backpack with a monitor attached inside to stay with for 96 hours. The monitor collected information on the air profile around the participant. It logged particulate matter (PM10, PM2.5), nitrogen dioxide (NO2), temperature, humidity, and GPS location. At the end of the week, data was uploaded to a central server for analysis.
Results: A total of 919 participants were screened male 511 and female 408. Overall, 62 participants were enrolled and monitored of which females were 33 (55%) and males 27(45%), with a mean (SD) age of 12.75 (0.86). Mean exposure was 34.1 µg/m3 higher than WHO's 24-hour PM2.5 exposure guideline of 15 µg/m3. High variability in exposures was observed between participants. Of the main microenvironments there were similar mean exposures between at school (34.9 µg/m3), commuting (38.6 µg/m3) and at home (30.0 µg/m3). However, commuting exposures had the largest range in exposure (15.6 µg/m3 - 163.0 µg/m3). There was no obvious trend for different schools, however, the highest mean concentrations were the schools around industrial areas slightly skewed with a large range in participant exposures recorded and highest commuting. Participants from schools with the lowest exposure also had short commuting periods suggesting they lived closer to the school.
Conclusion: The current mean PM2.5 exposure was high than what WHO recommended. Different microenvironments expose children to high levels putting them at risk of acquiring diseases later in life. Further studies need to establish mitigation strategies for children.

ECC3: Evaluating the health and socio-economic impacts of landscape restoration activities in Dodoma region

Presenting author: Faraja S. Chiwanga[1*]
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Background: Degraded natural ecosystems generate many interrelated global challenges including climate change and desertification, with a wide range of health impacts. Restoring degraded landscapes under 'nature-based solutions can deliver multiple societal benefits linked to the environment, health, and socioeconomics. Farmers in the Dodoma region of Tanzania have been combating desertification using Farmer Managed Natural Regeneration (FMNR), a low-cost and sustainable means of regenerating tree stumps and shrubs into fully grown trees. The intervention has restored 9 million native trees since 2019; the impact on health, socioeconomics and adaptive capacity of this intervention has however not been examined empirically.
Objective: To evaluate health and socio-economic impacts of FMNR and to map the causal pathways from the intervention to ecological, social and health outcomes.
Methods: We conducted Focus Group Discussions in two villages of Mpwapwa District. We used the Millennium Ecosystem Assessment (MEA) Framework to map the emerging themes to ecosystem services that have an impact on human health. MEA groups ecosystem services into four broad groups: supporting services (e.g., soil formation); provisioning (e.g., food); regulating services (climate) and cultural services (recreation and mental well-being).
Results: Participants across the four villages demonstrated an understanding of the link between ecological outcomes and improvements in health depicted by the MEA framework. As an example, several respondents traced improvements in food security to improved soil quality because of an increase in soil moisture generated by tree shading.
Conclusion: Findings from this study have demonstrated complex interlinking between ecological variables and health outcomes mediated by socio-economic factors. These pathways will require further empirical testing to quantify the exact impact on human well-being. The group discussions revealed that health and socio-economic benefits are major incentives for rural communities to engage in landscape restoration, and restoration initiatives that address local needs have more success.

ECC4: Prevalence of asymptomatic malaria, sub microscopic parasitaemia and anaemia in Korogwe District, north-eastern Tanzania

Presenting author: Paul Martine Hayuma[1*]
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Background: Asymptomatic malaria infections largely remain undetected and act as a reservoir for continuous transmission.
Objectives: To determine the prevalence of sub-microscopic asymptomatic malaria infections and anaemia in two rural settings of Korogwe District north-eastern Tanzania.
Methods: A cross-sectional malariometric survey involving individuals aged 0-19 years was conducted in June 2018 in the two rural villages. Venous blood was collected from eligible study participants for estimation of haemoglobin level, detection of malaria by RDT, quantification of malaria parasitaemia by microscopy, as well as dried blood spot (DBS) for determining sub-microscopic infections by PCR targeting the small subunit of the ribosomal ribonucleic acid (ssrRNA) of human Plasmodium.
Results: Out of 565 individuals tested, 211 (37.3%) were malaria positive based on RDT, whereas only 81 (14.3%) were positive by microscopy. Three out of 206 (1.5%) RDT/microscopy negative samples were P. falciparum positive by PCR. Of the 211 RDT and 81 microscopies positive, 130 (61.6%) and 33 (40.7%), respectively, were defined as being asymptomatic. Of the 565 individuals, 135 (23.9%) were anaemic (haemoglobin < 11 g/dL) out of which 5.2% were severely anaemic.
The risk of being anaemic was significantly higher among individuals with asymptomatic malaria as compared to those without malaria as confirmed by RDT (AOR = 2.06 (95% CI: 1.32-3.20) while based on microscopic results there was no significant differences observed (AOR = 2.09, 95% CI: 0.98-4.47).
Conclusion: Asymptomatic malaria is associated with an increased risk of having anaemia in the study communities. The findings highlight the need for targeted interventions focusing on asymptomatic infections which is an important risk factor for anaemia in the community and act as a source of continued transmission of malaria in the study area.

ECC5: First detection of potential carcinogenic toxins of Cylindrospermopsin and Nodularin in the Freshwaters of Lake Victoria, Tanzania
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Background: There is a global concern regarding the increase of cyanotoxins in freshwater and their potential effects on human health. The existence of multiple toxins in freshwater can result in an increased risk of their bioaccumulation in humans from their ingestion through contaminated drinking water or recreational activities. This study, the first of its kind, was conducted to determine the occurrence of thirteen cyanotoxins namely; microcystins (-LA, -LF, -LR, -LY, -LW, -RR, -YR, -WR, dm MC-RR and dm MC-LR), anatoxin-a, nodularin and cylindrospermopsin in the freshwaters of Lake Victoria in Tanzania.
Methods: A total of 23 sites were selected for water sampling. Samples were randomly collected from lakeshores (n = 54), wells (n = 66) and piped water (n = 18) in two phases, February (dry season) and December (rainy season) 2018. Samples (n = 138) were analysed using liquid chromatography mass spectrometry (UPLC-MS/MS).
Results: Cylindrospermopsin was the most abundant cyanotoxin detected in the lakeshores, with eight of the nine collection sites (89%) reporting cylindrospermopsin in phase I, compared to three out of

nine (33%) in phase II. Microcystin congeners -RR, -LR and -YR were detected in phase I, with microcystins -RR and -LR detected in phase II. MC concentrations ranged from 0.003 to 0.007 µg/L for MC-RR, 0.01–0.013 µg/L for MC-LR and 0.004 to 0.01 µg/L for cylindrospermopsin, with nodularin reported once at a concentration of 0.01 µg/L. No cyanotoxins were detected in wells or in treated pipe water samples.
Conclusion: The existence of multiple toxins in different collection sites may lead to synergistic effects and increase the toxicological risk to humans. This is the first study to report the presence of cylindrospermopsin and nodularin in the freshwaters of Lake Victoria.

ECC6: First multiple detection of cyanotoxins in human serum and potential risk for liver cancer after exposure from freshwater of Lake Victoria, Tanzania

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Background: Human intoxication and their health effect due to cyanotoxins exposure from drinking water is one of the neglected health problems that requires global attention. Occurrence of multiple cyanotoxins in Lake Victoria is of concern to human health, their existence may enhance levels of toxicity and synergistic effects that poses a higher risk to humans. This study aimed at assessing the exposure of cyanotoxins occurrence in drinking waters and risk of exposure to human in Ukerewe District Mwanza, Tanzania. Thirteen cyanotoxins namely; microcystins (-LA, -LF, -LR, -LY, -LW, -RR, -YR, -WR, desmethylated (dm) MC-RR, desmethylated (dm) MC-LR), cylindrospermopsin (CYN), nodularin (NOD), and anatoxin-a (ATX-A) were assessed in both samples of water from Lake Victoria and human blood.
Methods: A cross-section study was conducted using simple random sampling the selection of study subject from Ukerewe population n=432 and water samples collected from nine selected site along the lake shores in three consecutive weeks n=27 in February 2018. Samples were analysed using liquid chromatography mass spectrometry (UPLC-MS/MS).
Results: The result indicates that 7% of the tested serum samples were detected to have a various type of cyanotoxins such as CYN, dmMC-LR and NOD after exposure from contaminated water.
Eight nine percent of the water samples collection in eight sites were detected to have CYN, NOD, MC congener of (-RR, -LR and -YR). CYN toxins were highly detected followed by MC-RR, compared other toxins. This study present relationship between liver biochemistry indices such as ALP, Alb, TP, ALT, AST, and the existence of multiple toxins in human serum. This is the first study to report detect of CYN, dmMC-LR and NOD in human serum after exposure from drinking water.
Conclusion: Consumption of untreated water from the Lake Victoria poses a higher risk to human's health. Long-term studies should be conducted to enhance our understanding of the effects that attribute to the increase of cyanotoxins and emerging of new toxins such as CYN and NOD in Lake Victoria.

ECC7: Isolation of Histoplasma capsulatum, the causative agent of Histoplasmosis: A Case Study Mbeya Tanzania

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Background: Histoplasma is a genus of dimorphic fungi commonly found in birds and bats fecal materials and Histoplasma capsulatum is the causative agent of histoplasmosis which occurs worldwide and should not be overlooked in patients with unexplained pulmonary or systemic illnesses. H. capsulatum has been reported to cause human disease in the coastal areas around the cities of Tanga and Dar es Salaam. After exposure chronic histoplasmosis can resemble tuberculosis.
Methods: This was a case study conducted at NIMR-MMRC, bats droppings were collected into falcon tubes and transported to the lab prior processed, 0.5ml of 0.85%Nacl was used to prepare the inoculum by vortexing, few drops were inoculated on two Sabouraud dextrose agar plates, we incubated one plate at room temperature for few days and another at 370c for 24hours. The results were identified macroscopically and microscopically.
Results: Culture at 37°C we observed 2-3mm, wrinkled, moist, heaped, and creamy yeast like colonies, Gran stain we observed round, oval budding yeast cells at room temperature we observed white, fluffy mould that turns to brown to buff with age in sellotape techniques we observed the mycelium with round microconidia.
Conclusion: From the results the fungi investigated was Histoplasma capsulatum which is the causative agent of Histoplasmosis in human and people should be prevented from exposed spores. The chronic stage of histoplasmosis

ECC8: Incidence and Prevalence of Diarrhoea: Household Survey in Geita, Tanzania

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Background: Substantial progress has been made globally in reducing the burden of diarrhoeal diseases. However, evidence shows that diarrhoeal diseases disproportionately affect locations with poor access to health care, safe water, and sanitation, and low-income or marginalised populations.
Objective: To determine prevalence and incidence of diarrhoea among individuals living in randomly selected households in Busolwa and Mgusu wards in Geita region, Tanzania.
Methods: A cross sectional study design was conducted to generate baseline data for a randomized field trial. Using structured questionnaire, data on occurrence of diarrhoea a week before the survey was collected from 186 households in Geita region. Two villages from Mgusu ward and one village from Busolwa ward were selected because of their closeness to mining areas.
Results: A total of 1,281 individuals (1,070 above 5 years and 211 under the age of 5-year children) lived in 186 households (on average household had 7 individuals). Majority of households had unacceptable latrines (72.7%) with faeces being found in the surroundings of few households. The respondents had limited knowledge on handwashing and rarely used soap when washing hands. The reported one-week prevalence and incidence of diarrhoea was 10.8% and 8.4% respectively. Children under the age

of five years had high incidence (22.7%) of diarrhoea than individuals aged 5 years and above (5.6%). Among under five children, boys had high incidence and prevalence of diarrhoea than girls. Individuals with diarrhoea were likely to live in poor household, use of unsafe water and not using toilet.
Conclusion: In order to reduce incidence and prevalence of diarrhoea, there is a need for interventions to raise water, hygiene and sanitation awareness for individuals residing in mining areas.

2. Non-Communicable Diseases (NCDs)

According to the World Health Organization, NCDs represent the leading cause of death worldwide, killing 41 million people each year, which is equivalent to 71% of all deaths globally. Among NCDs, the four top killers that together account for more than 80% of all premature NCD deaths include cardiovascular diseases (17·9 million deaths annually), cancers (9·0 million), respiratory diseases (3·9 million), and diabetes (1·6 million). It is evident that injuries account for more than 5 million deaths equivalent to 9% of the world's deaths (WHO 2021).

There has been a surge in the burden of NCDs in sub-Saharan Africa over the past two decades, driven by increasing incidence of cardiovascular risk factors such as unhealthy diets, reduced physical activity, hypertension, obesity, diabetes, dyslipidaemia, and air pollution. NCDs are set to overtake communicable, maternal, neonatal, and nutritional (CMNN) diseases combined as the leading cause of mortality in sub-Saharan Africa by 2030. Important efforts are therefore needed to curb the burden of NCDs in the region starting with the provision of research-based evidence with reliable epidemiological estimates of NCDs and their drivers to appropriately inform prevention and control strategies.

The studies presented in this session include those that evaluated diagnostic criteria for NCDs, epidemiological studies on diseases and risk factors and evaluation of treatments and their outcomes.

NCD1: Frequency, Types and Socio-demographic Characteristics of Hematologic Malignancies Diagnosed at the Muhimbili National Hospital, Tanzania from 2019 – 2020

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Background: There is a rising epidemic of non-communicable diseases (NCD) in Africa. Cancers constitute one-third of the NCD burden with an alarmingly high mortality rate. The number of diagnosed hematologic malignancies (HM) has increased owing to the growing diagnostic capacity of HM in Tanzania. Most of these HM are currently diagnosed at Muhimbili National Hospital (MNH).
Objectives: To describe the frequency, types, and socio-demographic characteristics of HM in adult patients diagnosed at MNH in Tanzania between 2019 and 2020.
Methods: A retrospective cross-sectional study of adult patients diagnosed with HM was conducted between January 2019 and December 2020 at MNH. Patients' medical data were extracted from the laboratory information system using the REDCap survey tool before analysis.
Results: A total of 349 adult patients were diagnosed with hematologic malignancies during the two years. Of which; 193 cases were male (55.3%), with a male to female ratio of 1.2. The median age at diagnosis was 46 years (range, 18 - 86 years). Almost half (42.7%) of patients diagnosed resided in the Dar es Salaam region. CML (24.1%) was the most frequently diagnosed HM followed by non-Hodgkin lymphoma (15.8%) and AML (14.9%). MDS (6.9%), Hodgkin lymphoma (6.3%), and other

myeloproliferative neoplasms (3.7%) were the least frequent HM diagnosed. Also, most patients presented late with advanced disease. The majority of patients were from the Dar es Salaam region and had chronic leukaemia or indolent lymphomas at advanced stages.
Conclusion and recommendations: This observation indicates a significant proportion of patients with acute leukaemia or aggressive lymphomas do not survive long enough for the diagnosis to be reached especially those coming from peripheral regions of Tanzania. More efforts should be directed towards building capacity in early diagnosis of HM across all regions of Tanzania. Such as, access to a simple full blood count test in all primary healthcare centers.

NCD2: Histopathological evaluation of microtomy artifacts on haematoxylin and eosin section at Bugando Medical Centre

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Background: Artifact is something observed in scientific investigation or experiment that is not naturally present but occurs as a result of the preparation or investigative procedures.
Objective: To evaluate the type and prevalence microtomy artifacts found in histopathological tissue sections slides at Bugando Medical Centre.
Methodology: This is a cross-sectional observational study. 547 consecutive hematoxylin and eosin (HandE) stained sections slides were retrieved from the archives of histopathology laboratory at BMC and analyzed for artifacts under a light microscope.
Results: 547 Histopathological slides were retrieved for the study, only 412 (75.3%) Histopathological slides had Microtomy artifacts present while the remaining 135 (24.7%) Histopathological slides had no Microtomy artifacts. Of 412 slides with Microtomy artifacts, 204(49.5%) slides had only one type of Microtomy artifacts while the remaining 208 (50.5%) slides had more than one type of Microtomy artifacts. Out of the overall 672 Microtomy artifacts, 576 (85.7%) were due to section cutting, 4 (0.6%) were due to Floatation while the remaining 92 (13.69%) Microtomy artifacts were due to Trimming. The folding artifact was the most prevalent constituting 300(54.8%) and thick section 2(0.4%) was the least common.
Conclusion: The higher prevalence of microtomy artifacts at BMC reflects the burden of misdiagnosis in our setting. Section folding artifacts were the most prevalent pattern of artifact observed in this study. Proper technical measures need to be employed to prevent or minimize the occurrence of artifacts in a skilful manner, as they may pose diagnostic difficulties

NCD3: Prevalence and Spectrum of Germline SNV/indel and CNVs in BRCA1 and BRCA2 Genes among Breast Cancer Patients in Tanzania

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Background: The Growing prevalence and the aggressiveness of breast cancer (BC) among African women strongly suggest that the genetic risk factor implicated in the etiology of the disease may have a key role. Pathogenic germline mutations in BRCA1 and BRCA2 (BRCA1/2) are known to increase the lifetime risk of BC.
Objective: To investigate the prevalence and spectrum of single nucleotide variant/insertion and deletion (SNV/indel) germline mutations and copy number variations (CNVs) in BRCA1/2 among Tanzanian BC patients and evaluated the associations of identified mutations with patient's socio-demographic and histopathological characteristics.
Methodology: One hundred BC patients were examined for BRCA1/2 mutations using Next-generation sequencing. Sanger sequencing and multiplex ligation-dependent probe amplification (MLPA) assay were performed for the confirmation of SNV/indel mutations and CNVs, respectively.
Results: Six germline SNV/indel pathogenic mutations were detected from six unrelated patients. Five of these mutations were identified in BRCA1, and one in BRCA2, and we identified, in one patient, one variant of uncertain clinical significance (VUS). CNV was not detected in any of the BC patients. Furthermore, we found that in our cohort BRCA1/2 mutation carriers were triple-negative BC patients (p=0.019).
Conclusions: Our study provides the first insight into BC genetic landscape using NGS in the understudied Tanzanian populations. Our findings support the importance of genetic risk factors in BC etiology in Tanzania and showed a relatively high overall prevalence (6%) of germline BRCA1/2 pathogenic mutations in BC patients. Our results indicate that BRCA1/2 pathogenic mutation may well contribute to BC incidence in Tanzania. Thus, the identification of the frequent mutations in BRCA1/2 genes will enable the implementation of the rapid, inexpensive population-specific BRCA1/2 genetic testing particularly for triple-negative BC patients known for their high prevalence in Tanzania and will greatly contribute to provide effective therapeutic strategies.

NCD4: The use of a thermoplastic mask for head and neck cancer radiotherapy: Patients' understanding and experiences

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Background: A thermoplastic mask is a device used to immobilize head and neck cancer patients undergoing radiotherapy. The aim is to inhibit patients' motion and reproducibility of the treatment position throughout the radiotherapy course. Patients' understanding and experiences of using a thermoplastic mask during treatment can influence the treatment outcome. Anxiety is a common experience which can affect treatment delivery by interrupting treatment sessions for patients who use a thermoplastic mask during radiotherapy. To our knowledge, patients' understanding and experiences about a thermoplastic mask among head and neck cancer patients in the Tanzania oncology settings have not been explored.

Objective: To explore barriers and facilitators to patients' understanding of a thermoplastic mask among head and neck cancer patients as well as their experiences of using a thermoplastic mask during radiotherapy.
Methodology: A qualitative exploratory study design was employed among HNC patients at Ocean Road Cancer Institute. A purposeful sampling technique was used to recruit the participants. 13 In-Depth Interviews were conducted to collect the data. The data from participants were audio-recorded, transcribed, and analysed using the thematic analysis approach.
Results: Barriers identified were patient hesitancy to ask for information, shortage of staff during thermoplastic mask preparation and treatment and the use of technical words/medical jargon during communication. Identified facilitators to patients' understanding include good staff cooperation, use of polite words during communication and provision of adequate information to the patient. During thermoplastic mask use, patients experienced thermoplastic mask anxiety, discomfort, and pain after developing side effects.
Conclusions: Identified barriers to patients' understanding negatively influenced patients' experiences of thermoplastic mask use while facilitators improved their experiences.
Recommendations: There is a need to enhance communication with patients and ensure the availability of staff required during thermoplastic mask preparation and treatment. There is also a need for regular pain assessment and management.

NCD5: Women perspectives on cervical cancer screening services accessibility: A case of Mount Meru Regional Referral Hospital
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Background: Globally cervical cancer is the fourth most common cancer with estimation of 604000 new cases and 342000 deaths in 2020, incidence is high in a developing country like Tanzania with 80% of deaths. World Health Organization recommends service accessibility, regular and early screening. Accessibility of service entails coverage, services, timeliness, and availability of competent workforce. In Tanzania, the accessibility of screening services is limited. Despite the initiatives introduced for screening and control of cervical cancer, about 80% to 90% of cervical cancer patients fail to access services timely these results to late attendance at Hospitals in the advanced stage when cervical cancer is not curable.
Objectives: To investigate accessibility of cervical cancer screening services at Mount Meru Regional Referral Hospital.
Methodology: A case study design was employed to explore women's perspectives on accessibility of cervical cancer screening services. By using saturation principle, a total of 30 women aged 25 years and above were purposely and conveniently enrolled for study. Data were obtained using interview guide and documentary review, documents reviewed are Mid -Term Review of HSSP IV and National Cancer Control Strategy. Qualitative data were analyzed thematically.
Results: The findings show that income status and distance to facility were key barriers for the utilisation of cervical cancer screening services. Women demonstrated that payment of transportation fee limits regular cervical cancer screening. Furthermore, availability of fund, medical supplies and workforce reported to determine utilization of cervical cancer screening services. However, the reviewed documents reveal limited resources like fund and staff to facilitate service, with the coverage of 12% whereby screening services are provided only by a few hospitals in Tanzania.

Conclusions and recommendations: The study recommends promotion of effective accessibility and utilization of screening services through massive education and outreach services

NCD6: Effect of peer counsellor intervention on reducing mortality and/or hospitalization in adults with hypertensive urgency in Tanzania: a pilot study

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Background: People with hypertensive urgency experience high rates of medication non-adherence, hospitalization, and death worldwide. Interventions to improve medication adherence and health outcomes after hypertensive urgency are urgently needed.
Methods: In this historical control study, we assessed the effect of a peer counsellor intervention – named Rafiki mwenye msaada – on the 1-year incidence of hospitalization and/or death among adults with hypertensive urgency in Mwanza, Tanzania. The intervention cohort involved 50 patients who presented with hypertensive urgency to two hospitals in Mwanza, Tanzania. All 50 patients received a Rafiki mwenye msaada intervention consisting of 5 sessions delivered by a peer counsellor over 3 months. Outcomes were compared to historical controls.
Results: Of the 50 patients (median age, 61 years), 34 (68%) were female, and 19 (38%) had overweight. In comparison to the intervention cohort, the historical control cohort had a significant proportion of patients who attained a high level of education (35% vs. 22%, p=0.040) and had health insurance (87% vs. 40%, p<0.001). The 1-year cumulative incidence of hospitalization and/or death was 18% in the intervention cohort vs. 35% in the control cohort. Even after adjusting for differences in attained education level and health insurance status from historical controls, cumulative rate of hospitalization and/or death remained significantly lower in the intervention cohort (adjusted Hazard Ratio, 0.39, 95% CI 0.18-0.85; P = 0.018). More than 90% of the intervention cohort maintained good medication adherence at all follow-up time points.
Conclusion: Case management using peer counsellors for people with hypertensive urgency may significantly reduce rates of hospitalization and/or death after hypertensive urgency by improving medication adherence. Randomized clinical trials should be conducted to assess the impact of this peer counsellor intervention compared to local standards of care.

NCD7: Hypertension, Cardiovascular Diseases, and associated factors among Police Officers in Dare Salaam stations

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Background: Hypertension affects about one billion people globally which is equivalent to 26% of all adults. By the year 2025, 60% of all adults will be diagnosed with hypertension. Uncontrolled hypertension leads to Target Organs Damage and contributes to 7.1 million premature deaths worldwide.
Objectives: To determine the prevalence of Hypertension, Cardiovascular Diseases and associated factors among Police Officers in Dare Salaam stations which were yet investigated.
Methodology: Cross-sectional study was conducted in Dar es Salaam. Six police stations were involved, and 360 police officers were consecutively enrolled after consent. Demographic information, clinical and 2D M mode echocardiographic findings were recorded in a structured questionnaire. Statistical SPSS version 20 was used for data analysis. Regression analyses was done to assess the factors associated with CVD. Statistical significance was taken into consideration when a P value of < 0.05.
Results: A total of 360 police officers were enrolled and 262 (73%) were males and middle-aged 114 (31%). PC and NCO were 118 (32%) and 160 (44.6%) respectively. Overall, prevalence of hypertension was 209(58%.) Also, 124 (34.7%) and 19 (5.4%) were obese/overweight and diabetic, respectively. Those who did ECHO, 51 (66.2%) had HHD and 12 (15.6%) were normal. In a regression analysis, age 41-50 and 51+ years was found to be 3 times (OR=2.96 (1.20-7.36)) and 4 times (OR=3.69 (1.47-9.24)) more likely to get CVD, respectively. NCO is 2 times (OR=1.99 (1.10-3.59)) and Gazzeted officer/above 3 times (OR=2.92 (1.39-6.14)) more likely to get CVD as compared to PC. Obese is 2.12 times (OR=2.12 (1.02-4.42)) more likely to get CVD as compared to normal weight.
Conclusion and recommendations: The prevalence of hypertension and hypertensive heart disease were higher. Neither police rank nor other risk factors were associated with cardiovascular diseases/hypertension. Regular screening and further study are highly recommended

NCD8: Importance of Exercises on Human Health
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Background: Exercises are training of the body to specifically planned activities to develop and improve its functioning and enhance its fitness. Studies show that hominids existence survived by hunting and gathering food. This is very different from the way of life today. Evolutionary history prepared humanity for a different life from the one we live now. As a result, humans suffer implications of change of patterns of diseases associated with living habits and health. Regular physical activities reduce the risk of different chronic conditions like cancer, heart diseases, skin conditions, type two diabetes, depression, anxiety, and dementia.
The review went deep to look for implications of exercise on living habits and human health
Methods: Review of different articles on exercise and health, exercise in human, exercise and diseases were conducted by searching through different engines like PubMed, google scholar and google.
Findings: Recommended exercise is at least 150 minutes per week. Results from different studies indicate that exercise helps to control weight, decrease the risk of heart diseases, help to manage blood sugar and insulin levels and helps to quit smoking. It also improves mental health and mood, encourages thinking, learning and judgement. In general, exercises improve quality of life by preventing and treating diseases and overall improvement and enhancement of wellbeing throughout the life cycle.

Conclusion and recommendations: Taking into consideration that about 71% of people die from non-communicable diseases, there is an urgent need to encourage/facilitate people in developing World to develop the habit of doing simple exercises like walking due to increasing sedentary nature of life and dependency on different means of commuting form one point to another.

NCD: Non-communicable disease risk factors among caregivers of patients attending a tertiary cardiovascular hospital in Tanzania

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Background: Notwithstanding the ever-present burden of infectious diseases, sub–Saharan Africa (SSA) region has experienced a 67% rise in the NCD burden in less than three decades. Furthermore, regardless of the increased recognition of NCDs threat in the region, reliable local estimates and associated drivers is generally lacking.
Objective: To establish the pattern and correlates of the modifiable NCD risk factors among caregivers of patients attending a tertiary cardiovascular centre in Tanzania.
Methods: A cross-sectional survey was conducted at Jakaya Kikwete Cardiac Institute, Dar es Salaam, Tanzania. We used a structured questionnaire bearing a modified WHO STEPwise Approach to NCD Risk Factor Surveillance (STEPS) tool to explore the modifiable behavioural and modifiable biological NCD risk factors.
Results: A total of 1063 caregivers were enrolled in this study. The mean age was 40.5 years and 55.7% were female. Nearly 80% of participants had good knowledge regarding NCDs and 85.4% had a positive family history of NCDs. Overall, 1027 (96.6%) participants had at least one modifiable NCD risk factor while 510 (48.0%) had three or more (i.e., clustering). With respect to modifiable behavioural NCD risk factors, 34 (3.2%) were tobacco users, 56 (5.3%) had harmful alcohol consumption, 691 (65%) had unhealthy eating behaviour, and 820 (77.1%) were physically inactive. Pertaining to modifiable biological NCD risk factors, 710 (66.8%) had excess body weight, 420 (39.5%) had hypertension and 62 (5.8%) were diabetic.
Conclusions: A vast majority of caregivers of NCD patients in this tertiary setting were found to have modifiable NCD risk factors with a strong tendency of clustering. These findings call for intensification of both population strategies and targeted group interventions for better control of the NCD menace and its correlates.

NCD10: Obstructive sleep apnea and associated factors among hypertensive patients attending a tertiary cardiac centre in Tanzania: a comparative cross-sectional study

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Background: There is mounting evidence for a reciprocal yet bidirectional association between sleep-disordered breathing and hypertension. Obstructive sleep apnea (OSA), a common cause of systemic hypertension is an independent risk factor for hypertension-related cardiovascular morbidity and mortality.
Objective: To explore the burden of obstructive sleep apnea and its associated risk factors among hypertensive patients attending Jakaya Kikwete Cardiac Institute.
Methodology: A total of 1974 individuals (i.e., 1289 hypertensive and 685 normotensives) were consecutively enrolled in this study. The Berlin questionnaire and Epworth Sleepiness Scale were utilized in the assessment of OSA and excessive daytime sleepiness (EDS) respectively. Logistic regression analyses were employed in the determination of associated factors for OSA.
Results: The mean age was 53.4 years and females constituted the large majority (60.4%) of participants. About three-quarters (74.1%) of participants had excess body weight, 11.6% had diabetes, 8.0% had asthma and 18.6% had a history of recurrent nasal congestion. Positive family history of snoring was reported by 43.1% of participants and 36.9% had a personal history of snoring. Persons with hypertension displayed a higher frequency (42.1%) of OSA compared to their normotensive counterparts (11.8%), $p < 0.001$. Multivariate logistic regression analyses revealed hypertension (OR 5.1, 95% CI 3.2-8.2, $p < 0.001$), diabetes mellitus (OR 2.2, 95% CI 1.3-3.5, $p < 0.01$), chronic nasal congestion (OR 1.6, 95% CI 1.1-2.5, $p = 0.01$), obesity (OR 2.4, 95% CI 1.8-3.3, $p < 0.001$), increased neck circumference (OR 2.7, 95% CI 1.2-6.4,$p = 0.02$), family history of snoring (OR 5.5, 95% CI 4.0-7.5, p 8 h/24 h (OR 0.6, 95% CI 0.4-1.0,$p = 0.03$) to have an independent association for OSA. Furthermore, participants with hypertension displayed superior odds for OSA compared to their normotensive counterparts across all subgroup analyses.
Conclusion: OSA is considerably common among patients with hypertension in a tertiary health care setting in Tanzania. Positive family history of snoring was the strongest associated factor; however, excess body weight proved to be the strongest modifiable risk factor. In view of its pervasiveness, OSA should be an integral part of the medical evaluation in hypertensive individuals.

NCD11: Prognostic role of cardiac, pulmonary, and systemic congestion in patients hospitalized for acute heart failure

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Background: Clinical congestion is the main driver of heart failure (HF) decomposition and hospitalization. The combined assessment of congestion status at admission, through clinical examination, echocardiography, and lung ultrasound, should be used to better recognize the type and the site of congestion. Different congestion location may be related with different outcome.
Objectives: To evaluate: 1. Cardiac, pulmonary and systematic congestion occurrence in heart failure with reduced ejection fraction (HFrEF) and heart failure with preserved ejection fraction (HFpEF); 2. The prognostic role of different congestion (cardiac vs. pulmonary vs. systematic in terms of cardiovascular death or re-hospitalization during 6-month of follow-up).
Methods: This is a single Centre, observational study including patients with the diagnosis of acute heart failure (AHF) according to the recent HF guidelines. All patients underwent; 1. Clinical examination evaluating typical HF congestion signs (rales, jugular vein distension, hepatomegaly, peripheral edema, third heart sound). 2. Trans-thoracic echocardiography evaluating left ventricular ejection fraction (LVEF), diastolic function, pulmonary artery systolic pressure (PASP), Inferior cave

vein (ICV) size and collapse. 3. Lung ultra-sound through 8 thoracic spaces evaluating the number of B-lines. Patients were followed 6 months after discharge for cardiovascular death or re-hospitalization. **Results:** A total of 230 patients AHF (135HFrEF and 95HFpEF) were included in the analysis. Systemic congestion was significantly prevalent In HFrEF with respect to HFpEF due to the evidence of increased ICV size (22±5 vs. 17±4mm; p≤0.05) and a lower rate of reduced IVC collapse in HFrEF compared with HFpEF (47% vs 32%; p≤0.01) No significant differences were found between HFrEF and HFpEF in terms of total B-Illness number and E/e` ratio. Univariate analysis showed the B-illness ≥ 30 and ICV ≥21mm were significantly related to poor prognosis (respectively HR=2.3 and HR=1.7; p≤0.05) These results were confirmed by the multivariable analysis after the adjustment for cardiovascular risk factors, LVEF and NYHA class (respectively HR=1.5 and HR=1.7; p≤0.05). Among the three congestion subtypes, only the systematic congestion resulted significantly related to a worse outcome at univariate analysis (HR=1.9, p≤0.05).
Conclusions: congestion status was different between HFrEF and HFpEF patients. The systemic congestion was related to poorer outcomes. There is a linear trend among single, double, and triple congestion sites and increased risk for adverse events. Systemic congestion appears to be much more related to adverse prognosis. In hospital HF was often associated with uncompleted systemic and pulmonary congestion resolution. Further studies should investigate what is the best decongestion strategy by serial and qualitative measurement of congestion localization in AHF.

NCD12: Screening for high blood pressure among adolescents in school settings in Mwanza city – Tanzania

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Background: High blood pressure (BP) among children and adolescents is increasingly becoming common. However, prevalence estimates vary widely partly due to variations in study setting (rural/urban), method of BP measurement and definition of high BP. Few studies have used unattended automated office BP measurements (AOBP) and to the best of our knowledge no study in Africa has used 24-Hour ambulatory BP measurement (24-Hour ABPM) for confirming high BP among adolescents.
Objectives: To estimate prevalence of high BP using unattended automated office BP (on two separate occasions) and 24-hour ABPM for confirmation of sustained high BP and ruling out white coat hypertension.
Methods: From April to September 2018, we enrolled 500 adolescents aged between 11 and 15 years from 3 public secondary schools in Mwanza city. Using standard procedures, we obtained 3 unattended AOBP readings on the first occasion. On the second occasion – within 2 weeks - 3 unattended AOBP were obtained from participants who had high BP on the first occasion. Within a month, 24-Hour ABPM was done on participants with persistently high BP on the second occasion.
Results: The median age (Interquartile range) of participants was 14.0 (13.0 – 15.0) years and 56.6% of participants were females. Most participants (91.2%) had their BP measured for the first-time following participation in this study. Based on three BP measures taken during the first occasion, prevalence of high BP was 36.6% (183) and 25.6% (128) using first BP measure and average of last two BP measures,

respectively. On the second occasion, 10.2% (51) had persistently high BP using average of last two readings. 2.6% (13) had sustained high BP using 24-Hour ambulatory BP measurement.
Conclusion: White coat hypertension is common among adolescents in Tanzania. School based screening for high BP is feasible and could be used for cardiovascular health promotion.

NCD13: sonographic findings of carotid artery disease in adult hypertensive patients as a risk of stroke at Jakaya Kikwete Cardiac Institute
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Background: Hypertension has been identified as the leading risk factor for morbidity and mortality worldwide. It is the main risk for Ischemic stroke and carotid artery disease due to atherosclerosis. Stroke is the leading cause of morbidity, mortality, and disabilities worldwide. Extracranial ultrasonography is recommended for an initial evaluation of carotid artery disease
Objective: To evaluate sonographic findings of carotid artery stenosis in adult hypertensive patients at Jakaya Kikwete Cardiac Institute (JKCI).
Methods and materials: A cross-sectional hospital-based study, conducted at JKCI for a period of 7 months. Consented adult patients with hypertension were consecutively included for sonographic assessment of extracranial carotid arteries. Demographic information and history of associated factors were recorded in a structured questionnaire. Clinical and imaging information was recorded in the data recording sheet. Statistical SPSS version 20 was used for data analysis. Descriptive analysis was used to present and describe sonographic findings of carotid artery disease and associated factors Pearson Chi-square and Fisher's exact tests were used to compare proportions between independent variables Statistical significance was taken into consideration when a P value of < 0.05.
Results: One hundred and four (104) patients with hypertension were studied with the mean age 62 (SD- 9) years. Most patients had 51- 60 and above years 40(38.46%), and females were 77(74.04%). Main risk factors were overweight (50.96%) and diabetes (26.92%). Carotid Doppler USS revealed Intima media thickness (53.85%) and plaque (30.77%). These changes were significantly associated with age (p value= <0.05), hypertension and dyslipidaemia (p value= <0.05).
Conclusion and recommendations: Sonographic findings of extracranial internal carotid artery disease in patients with hypertension were intima-media plaque and stenosis. Atherosclerosis changes were associated with high BMI, dyslipidaemias, advanced age, and female gender. Ultrasound evaluation of carotid vessels to be included in the evaluation of patients with primary hypertension.

NCD14: An Integrated Management System for the treatment of Noncommunicable Diseases: results from program implementation in Iringa district
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Background: Morbidity and mortality due to noncommunicable diseases (NCDs) are growing exponentially in Sub-Saharan Africa, including Tanzania. Hypertension is the most common NCDs in Tanzania representing the leading cause of death after HIV. A major role is also played by diabetes, with a prevalence of 9% among adults 25-64 years old and a very high incidence of complications.

The limited availability of dedicated services represents a key factor in the increased burden of NCDs in the Country. Since March 2019, a specific integrated management system has been implemented in Iringa District Council to treat patients with hypertension and diabetes.
Objectives: The purpose of this study is to share the results of the first three-year roll-out of the system.
Methodology: We analysed data regarding 1300 patients who have been enrolled into the program between March 2019 and February 2022. Data on follow-up were retrieved every six months on the occasion of the reassessment visit.
Results: Findings show that the percentage of patients on follow-up over the total enrolled patients is 50,4% at 6 months, 38,7% at 12 months, 33,9% at 18 months, and 28,2% at 24 months. Many of the patients on follow up reached the target of treatment for BP and improved the glycaemic control. Most patients who were lost to follow-up or did not reach the targets were those without medical insurance or living in remote peripheries.
Conclusions: This study presents a useful framework to be shared with actors and professionals involved in the treatment of NCDs. Particularly, our experience suggests that the integration between primary health facilities and referral hospitals, the creation of specific pathways for patients may represent useful features for the effective management of patients with NCDs.

NCD15: The relationship between types of ownership of motorcycle and the risk of road traffic injuries and mediating factors among commercial motorcycle drivers– A case control study in Dar es Salaam, Tanzania

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Background: Commercial motorcycling transportation business is an important source of employment in many low- and middle-income countries. The working conditions related to, low earnings, job insecurity, and lack of income guarantee may put drivers at greater risk of road traffic injuries (RTIs).
Objectives: To determine the associations between different types of ownership of motorcycle and the risk of RTIs, with risky driving behaviours, the number of working hours and motorcycle conditions as potential mediators among commercial motorcycle drivers.
Methods: A case-control study was conducted among 164 cases and 400 controls of commercial motorcycle drivers in the city of Dar es Salaam. Cases were identified at the hospitals, and controls were randomly selected from the parking stages of commercial motorcycle drivers. The associations between the types of ownership of motorcycles and the risk of RTIs were assessed using univariate and multivariate logistic regression. Mediation analysis was used to assess to what extent risky driving behaviors, number of working hours and the motorcycle conditions mediate the associations between types of ownership of motorcycles and the risk of RTIs. Odds ratio with 95% confidence intervals was used to present the effect size.
Results: The odds ratio for RTIs was significantly higher among drivers who co-owned their motorcycles (OR=3.42, 95% CI: 1.94 -6.02) and rented (OR=2.05, 95% CI: 1.25 –3.48) compared to drivers who owned their motorcycles after adjustment for sociodemographic characteristics and years of driving experience. Risky driving behaviors significantly mediated the relationships between the risk of RTIs and the rented motorcycle drivers (indirect effect: (OR=1.24, 95% CI: 1.09-1.40), while the

number of working hours mediated the relationships of the risk of RTIs and the co-owner motorcycle drivers (indirect effect; OR=1.19, 95% CI: 1.06 - 1.34) compared to those who owned their motorcycles.
Conclusion and recommendations: The results suggest an association between types of ownership of motorcycles and RTIs, with the highest risk found to be among co-owned and rented motorcycle drivers. Additionally, risky driving behaviours partially explained the relationships between the risk of RTIs and drivers operating rented motorcycles, while the number of working hours mediated the relationships between the risk of RTIs and co-owned motorcycles drivers. These findings suggest further investigation of challenges of the working conditions of the commercial motorcycle drivers as a precarious job in order to reduce the burden of RTIs. There is a need of developing a policy for regulating motorcycling business as informal job to reduce the burden of the RTIs among motorcyclists and other road users

NCD16: A pilot, masked, randomized controlled trial to evaluate local gentamicin versus saline in open tibia fractures

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Background: Open tibial fractures have a high risk of infection that leads to chronic osteomyelitis, functional impairment, and limb loss. Antibiotics administered locally at the site of the open wound are a potentially effective preventive measure, but there is limited data evaluating aminoglycoside antibiotics.
Objective: To assess the feasibility of a clinical trial aimed to test the efficacy of local gentamicin in reducing the risk of fracture-related infection (FRI) after open tibial fracture.
Methods: This study is a single-center pilot masked, randomized controlled trial conducted at the Muhimbili Orthopaedic Institute. All adult patients presenting with an open tibia fracture (Gustilo Anderson Types I, II or IIIA; OTA Type 42) were eligible for this study. Patients were excluded if time from injury to presentation was > 48 hours or time from injury to surgery was > 7 days. Participants were randomized intraoperatively after wound closure to receive gentamicin solution (treatment), or normal saline solution (control) injected at the fracture site. Patients, surgeons, outcome assessors, data collectors, and data analysts were all masked to treatment assignment. Follow-ups were completed at 2-weeks, 6-weeks, 3-months, 6- months, 9-months, and 1-year post-operatively. The primary feasibility outcomes were the rate of enrolment and retention. The primary clinical outcome was the occurrence of FRI. Secondary outcomes measured were the occurrence of non-union, unplanned fracture-related reoperations, EQ-5D score, FIX-IT sore, and modified RUST score.
Results: Of 199 patients screened, 100 eligible patients were successfully enrolled and randomized over 9 months (11.1 patients/month). Most of the study population were male (80%) with an average age of 34 (SD 12.3). The primary mechanism was road traffic injury (85%). Complete data were recorded at baseline and follow up for >95% of cases The rate of follow up at 6-weeks, 3-months, 6-months, 9-months and 1 year were 70%, 68%, 69%, 61% and 80%, respectively. There was no difference in adverse events, or any of the measured primary and secondary outcomes.

Conclusion: This pilot study is among the first to evaluate locally administered gentamicin in open tibial fractures. Results indicate a rigorous clinical trial with acceptable rates of enrolment and follow up to address this topic is possible in this setting. We, therefore, plan to proceed with a well-powered definitive trial.

NCD17: Implementation Fidelity of Gender Based Violence screening practice among healthcare providers in the health care facilities of Dodoma Region

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Background: Screening of Gender Based Violence (GBV) is a crucial point to identifying the survivors of GBV and provides the appropriate management for their healing. GBV screening rate among healthcare providers is reported to be low global including in Tanzania.
Objectives: To determine the level of adherence to the GBV screening practice among the healthcare providers in the health facilities of Dodoma.
Methodology: This was an analytical cross-sectional study design; mixed methods approach. A multi-stage sampling technique was applied to obtain 384 healthcare Providers. The Interviewer-administered questionnaire was used to collect quantitative data from healthcare providers in health facilities of Dodoma Region. On the other hand, qualitative data were generated through focused group discussions with 21 healthcare providers. SPSS was used for Quantitative analysis of Descriptive statistics to determine the level of adherence, Logistic regression for factors and thematic analysis for challenges affecting adherence to GBV screening.
Results: This study found low level of adherence whereby 63 (16.4%) of healthcare providers adhered to the GBV screening practices. Association of factors showed that; those who were not trained had low adherence to the GBV screening practices compared to those who were trained (AOR = 0.206, P<0.0001). Nurses were less likely to adhere to GBV screening practices in reference to the doctors (AOR=0.46, p=0.037). Some of the challenges were cost of GBV services, lack of effective tracking for GBV Services
Conclusion and recommendation: The results show that most of the healthcare providers in Dodoma do not adhere and few providers do GBV screening. There is a need to address challenge and factors to improve the adherence to GBV screening including enough training, effective tracking for the GBV services, legalize exemption of GBV survivors in the health policy.

NCD18: Patient outcomes and experience after traumatic spinal cord injury: A mixed method study.

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Background: Traumatic spinal cord injury (TSCI) is a sudden forceful damage to the spinal nerves resulting in temporary or permanent paralysis. Those who survive face lifelong risk of secondary complications and subsequently poor health, physical dependence, and early death. Few outcome

studies are published for rural low-income areas and data are scarce on the causes and experiences of those who survive a SCI longer-term.
Objectives: To examine the outcomes of individuals with TSCI and describe how those who survived longer-term in rural Tanzania cope with their injury.
Methodology: Individuals who sustained a TSCI and were admitted to KCMC were recruited over one year. The causes, severity and location of injury, and hospital discharge outcomes were obtained by patient-observation, ward rounds, patient, and records. Purposive sampling identified individuals who lived with TSCI longer than 5 years for participation in in-depth qualitative interviews. Qualitative data were transcribed, translated, and coded using a modified grounded theory approach to identify categories of coping. Quantitative data were analyzed descriptively using SPSS.
Results: Eighty-seven individuals with TSCI admitted to the hospital were enrolled (79.3% male). Injuries were predominantly from falls (66.6% and mostly from trees) and road traffic accidents (29.9%), with 56.3% affecting the cervical spine, and 42.5% were complete injuries (most severe). Thirteen individuals died after being admitted; among those discharged home, 39.1% were wheelchair dependent, 23.0% used a walking aid, and 20.7% walked independently. Ten individuals (70% males) who survived 7-28 years after injury described internal coping resources (e.g., secured in God, social and problem-solving skills) and external (reliable family, community support and material possessions) and dependence on these resources facilitated acceptance.
Conclusions and recommendations: Addressing falls would reduce TSCI incidents in this region. Rehabilitation services ought to facilitate identification and utilization of the available coping resources.

NCD19: Autism Spectrum Disorder: A review of contemporary literature on common communication difficulties and recommended research-based intervention strategies
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Background: Autism Spectrum Disorders encompass the formally known as Asperger's syndrome, Autistic disorder, and Pervasive Developmental Disorders-Not Otherwise Specified. ASD indicates a wide range of symptoms and severity, implies that needs and strengths among individuals vary from severe to giftedness across the board. The disorder is an early onset one, pervasive and lifelong. The current prevalence rate in the world is 1 in 160. Not much is known about prevalence of ASD in Africa and other developing countries. However, data available from a few studies indicate the same trend of prevalence, as in developed countries. For example, prevalence of ASD in studies done in Tunisia and Egypt (respectively) was 11.5% and 33.6% among children with developmental disabilities.
Objective: To conduct a general review of contemporary literature about communication difficulties affecting learners with Autism Spectrum Disorder and the recommended research-based intervention strategies on the same.
Methods: Articles and research findings published in international peer-reviewed journals were objectively scanned through. The target beneficiaries of this study are parents of learners with ASD, educators, speech therapists related service providers and other relevant stakeholders.
Results: Learners with Autism Spectrum Disorder exhibit a series of communication challenges. Although not every child with ASD has a language problem, their ability to communicate varies across the spectrum. It is dictated by severity, cognitive ability, and social development of the individual.

Majority of individuals have challenges in both receptive and expressive language. Further, almost all learners with ASD have difficulties understanding body language. Failure to understand context, abstract and figurative language is also a common barrier to communication in individuals with ASD. Majority of individuals with ASD also struggle with meaning and rhythm of words. Many concentrates on the keyword and not the entire statement during conversations. Other communication challenges include echolalia, lack of reciprocity, and turn taking difficulties. To address the above challenges, researchers have produced evidence-based intervention strategies. Interventions fall into two categories; the ones speech therapist use and those they train family and caregivers to use. Some interventions are hi-tech while others are low tech, cheap to make and easy to use. They include AAC, manual signing, pantomime intervention, eye gaze intervention, picture exchange communication and facilitated communication.
Conclusion and recommendation: No one intervention technique works perfectly across the board. Speech Therapists must therefore understand the needs and behaviour of the individual child before using or recommending a strategy. This will reduce the possibility of system abandonment. For positive results, family members and peers need to be incorporated in the interventions.

NCD20: Burden and correlates of cognitive impairment among hypertensive patients in Tanzania: a cross-sectional study
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Background: The evolution of cognitive impairment of vascular origin is increasingly becoming a prominent health threat particularly in this era where hypertension is the leading contributor of global disease burden and overall health loss. Hypertension is associated with the alteration of the cerebral microcirculation coupled by unfavourable vascular remodelling with consequential slowing of mental processing speed, reduced abstract reasoning, loss of linguistic abilities, and attention and memory deficits.
Objective: To assess the prevalence and correlates of cognitive impairment among hypertensive patients attending a tertiary cardiovascular hospital in Tanzania.
Methodology: A hospital-based cross-sectional study was conducted at Jakaya Kikwete Cardiac Institute, a tertiary care public teaching hospital in Dar es Salaam, Tanzania between March 2020, and February 2021. A consecutive sampling method was utilized to recruit consented hypertensive outpatients during their scheduled clinic visit.
General Practitioner Assessment of Cognition (GPCOG) Score was utilized in the assessment of cognitive functions. All statistical analyses utilized STATA v11.0 software. Pearson Chi square and Student's T-test were used to compare categorical and continuous variables, respectively. Logistic regression analyses were used to assess for factors associated with cognitive impairment. Odd ratios with 95% confidence intervals and p-values are reported. All tests were 2-sided and $p < 0.05$ was used to denote a statistical significance.
Results: A total of 1201 hypertensive patients were enrolled in this study. The mean age was 58.1 years and females constituted nearly two-thirds of the study population. About three quarters had excess body weight, 16.6% had diabetes, 7.7% had history of stroke, 5.7% had heart failure, 16.7% had renal dysfunction, 53.7% had anemia, 27.7% had hypertriglyceridemia, 38.5% had elevated LDL, and 2.4% were HIV-infected. Nearly two-thirds of participants had uncontrolled blood pressure and 8.7% had

orthostatic hypotension. Overall, 524 (43.6%) of participants had cognitive impairment. During bivariate analysis in a logistic regression model of 16 characteristics, 14 parameters showed association with cognitive functions. However, after controlling for confounders, multivariate analysis revealed ≤primary education (OR 3.5, 95%CI 2.4–5.2, p < 0.001), unemployed state (OR 1.7, 95%CI 1.2–2.6, p < 0.01), rural habitation (OR1.8, 95%CI 1.1–2.9, p = 0.01) and renal dysfunction (OR 1.7, 95%CI 1.0–2.7, p = 0.04) to have independent association with cognitive impairment.
Conclusion: This present study underscore that cognitive decline is considerably prevalent among individuals with systemic hypertension. In view of this, it is pivotal to incorporate cognitive assessment in routine evaluation of hypertensive patients.

NCD21: Depression and violence perpetration among young men in Mwanza, Tanzania
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Background: Depressive symptoms have received less attention in low and middle-income countries despite their high contribution to the disease burden. There is scarce information on the extent of mental disorders among young people in low-income contexts such as Tanzania and its association with Intimate Partner Violence (IPV), an established global health problem.
Objective: To determine the prevalence of intimate partner and non-partner sexual violence perpetration and symptoms of depression among young men in Mwanza, Tanzania.
Methods: We conducted a cross-sectional survey among 1000 young men aged between 18 to 24 years in Mwanza city. We used tablets to collect data on self-reported perpetration of last year's intimate partner and lifetime non-partner sexual violence and PHQ-9 measurement tools for self-reported depressive symptoms. Analysis was conducted through STATA version 13 software.
Results: Young men reported high rates of IPV perpetration that included 65% for any form of violence, 26% for physical and or sexual violence, 23% for economic abuse, 35% for emotional abuse, and 60% for controlling behaviors; 9% reported non-partner-sexual violence. In total, 31% of young men self-reported mild and 7% moderate depressive symptoms, and four percent ever considered committing suicide. Having depressive symptoms was significantly associated with last year's physical and/or sexual IPV (33% vs 47%) and non-partner sexual violence perpetration (8% vs 12%), even after controlling for age and alcohol use (IPV: aOR:2.09 95%CI:1.51-2.89; NPSV:1.99, 95%CI:1.26-3.14). Suicidal ideation showed similar trends, but no significant associations.
Conclusions and recommendations: Integration of mental disorders reduction programs in partner violence prevention interventions can play a significant role in addressing both issues at once and may lead to synergistic effects. Targeting young men can lead to a significant impact and increase the sustainability of the changes.

NCD22: Prevalence and factors associated with substance use among HIV positive youth attending HIV care and treatment centers in Dodoma, Tanzania

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Background: Substance use among people living with HIV is associated with poor health, social and psychological outcomes. People living with HIV who use substances have a higher likelihood of being non-adherent to antiretroviral therapy, are at an increased risk of developing opportunistic infections, and are more likely to engage in risky sexual behaviors.
Objective: To determine the prevalence and determinants of substance use among youth attending HIV care and treatment centers (CTCs) in Dodoma, Tanzania.
Methodology: This was an analytical cross-sectional study design carried out in Dodoma, Tanzania from February to April 2020 among youth aged 15-24 years attending HIV CTCs. Data was collected using sociodemographic, WHO ASSIST V.3.0., BDI II and SERAD questionnaires. Data analysis was done using SPSS version 25, descriptive statistics were used to summarize continuous and categorical variables. Multivariable logistic regression analysis was done to determine factors associated with substance use among HIV positive youths.
Results: The prevalence of substance use among HIV positive youth attending CTC was 6.6%. We observed a significant decreasing odd of substance use with every year increase in age at HIV diagnosis (OR: 0.74; 95% CI: 0.59, 0.93) and among unemployed youths (OR: 0.01; 95% CI: 0.00, 0.22)
Conclusions and recommendations: Despite the low prevalence of substance use found in this study, it is important to note the factors associated with substance use and their impact on the health of these youth. It is recommended that CTCs screen for substance use among youth who have high viral loads.

NCD23: Tackling the hidden epidemic of non-communicable diseases in rural Tanzania: the Kilombero Ulanga Malinyi Heart and Lung Disease Cohort

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Background: Cardiovascular diseases, cancer and respiratory diseases account for most burden of the non-communicable diseases. Deaths due to NCDs disproportionately occur in low to middle income countries attributing to about 77% of all NCD deaths globally. A comprehensive approach promoting awareness, screening, early detection treatment and follow up is evidently more than warranted.
Objective: To promote awareness, screen, correctly diagnose and follow up heart and lung diseases patients in people living in Kilombero valley.
Methods: This is a prospective study that set up a specialized heart and lung disease clinic located within St Francis Referral hospital, Ifakara, Morogoro. This unit offers specialized level care to both in and outpatients with heart and lung diseases, diagnostics including echocardiography, 24-hr blood pressure monitoring, 24-hr electrocardiography, point of care INR, lung ultrasound and spirometry. All

patients diagnosed with chronic heart and lung diseases are voluntarily asked to join an open cohort where they are followed up subsequently. Social demographic and clinical data is collected at base line and follow up visits, respectively. All data is captured using an electronic database, REDCAP. Enrolment is also done through the community outreach programs conducted once every month. Regular trainings to health care workers in respiratory and cardiovascular medicine is conducted both online and on site.

Results: From January 2021 to March 2022, we have screened 2144 patients, performed 1461 ECHOs and 53 spirometry tests. Out of all these 177 participants were eligible and enrolled in the cohort. Majority were female 100 (56.6%), the median age 54.6 IQR (37.3-67.2), and married 121 (68.4%). Majority had primary school education 119 (67.2%) and had irregular income 118 (66.7%). Majority have never smoked, 138 (78%), 34 (19.2%) use alcohol and among those 20 (58.8%) had alcohol abuse. Most of the patients received outpatient care 162 (91.5%). The overall prevalence of Hypertension was 87 (48.4%). While a third 67 (37.9%) of participants previously had a cardiovascular diagnosis only 62 (35.0%) were on medication, similarly 23 (13%) had a previous respiratory diagnosis but 6 (3.4%) were on medication. The most common diagnosis was dilated cardiomyopathy 103 (58.2%) followed by Post Pulmonary TB lung disease, 13 (7.3%).

Conclusion: Chronic cardiovascular and respiratory diseases remain prevalent and under-diagnosed in rural settings due to lack of comprehensive health systems to enhance early detection and offer chronic care to those already diagnosed.

NCD24: Assessment of the effect of routinely designed NCD package of care in Dar es Salaam

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Background: There is a high burden of non-communicable diseases worldwide. Urban lifestyle, insufficient knowledge on prevention and poor accessibility to health facilities are some of the factors fuelling NCD in developing countries. Currently, there are a smaller number of NCD cases detection and treatment at OPD, lack of accessibility of immediate treatment after being screened and insufficient knowledge on symptoms and risks of NCDs conditions prevention.

Objectives: To observe the effect of introduction of i) NCD risk factors screening triage desk to all facilities ii) Establish and strengthened NCD clinics at all primary health facilities iii) Health educations during outreach services.

Methodology: Descriptive cross-sectional study was conducted in Dar es Salaam region collecting data using quantitative method for the period 2018 to 2020. We observed i) Establishment and strengthening of NCD clinics at all primary health facilities to be conducted at least once a week/month ii) Each facility to establish a triage desk for screening risk factors and cases for all patients attending at OPD and all women attending RCH for family planning. Health education was given to the community around the facility during outreach services to increase awareness and sensitization for early treatment at OPD. Data were analyzed descriptively.

Results: The results show that from 2018 to 2020 there was an increase in proportion of OPD attendance for NCD treatment; Diabetes from 1.5 to 2, Hypertension 0.45 to 0.56, Asthma 0.87 to 1.1, and Malignancies cases from 0.08 to 0.16. There was increase in diabetic case detection rate from 2.3 to 2.6.

Conclusion: There is an increase in NCD case detection rate and cases treated by increasing NCD clinics accessibility and use of NCD triage desks. More robust evaluation research should be done on these interventional packages to ascertain the observed effect.

NCD25: A randomised placebo-controlled double-blind phase II trial to determine the effects of metformin versus placebo on glycaemia in HIV-infected persons with pre-diabetes in Tanzania

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Background: An estimated 460 million adults worldwide were living with type 2 diabetes in 2019, and this is rising rapidly. Studies have shown that 10-20% of subjects with prediabetes progress to clinical diabetes each year, and 70% of these individuals can expect to go on to develop overt diabetes during their lifetime. Metformin is the recommended first-line drug for persons with diabetes and HIV-infection in the world. Based on the evidence, we believe that metformin is safe for use in HIV-infected individuals on antiretroviral treatment (ART) who have pre-diabetes.
Objective: To conduct a phase II trial and generate the data needed to design a phase III trial
Methods: We conducted a phase II randomized double-blind placebo-controlled trial to evaluate the use of metformin in HIV-positive persons on ART with pre-diabetes. This study was designed to inform a phase III trial that will evaluate whether metformin can reduce the progression to diabetes. The study was based at Amana, Mwananyamala, Temeke and Hindu Mandal Hospitals. Eligible participants were HIV-infected adults on ART and confirmed to be pre-diabetic, using either impaired fasting glucose and/or impaired glucose tolerance. Enrolled subjects were randomly allocated into two study arms in a ratio of 1:1 to receive either metformin or placebo. The follow up period was 12 months.
Results: Out of 364 enrolled participants; 306 were evaluated after completing 12 months of follow up. There was a slight reduction of weight in both arms, larger weight reduction was observed in metformin arm. Despite weight reduction no significant difference was observed in 12 months OGTT in both arms P-value 0.282. Most of the participants in the placebo arm developed adverse events. This reflects that most of the adverse events were not related to metformin.
Conclusion: Metformin is safe to use in HIV positive adults with prediabetes.

NCD26: Dynamics of blood pressure and body composition during first year of antiretroviral therapy in people with HIV compared to community controls

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Background: People living with HIV (PLWH) initiating antiretroviral therapy (ART) experience a rapid increase in blood pressure (BP) during the first year of ART and this may be explained by changes in body composition. Longitudinal studies are lacking.
Methods: We analyzed data from a cohort study of PLWH and HIV-uninfected adults chosen from the same communities in Mwanza, Tanzania. Data on BP and body composition were collected at baseline and 12 months follow-up. We used multivariable mixed effect linear regression to compare BP changes over the year in PLWH and HIV-uninfected adults, and the relationship between changes in body composition with changes in BP.
Results: BP data was available for 640 PLWH and 299 HIV-uninfected adults. Sixty four percent were women, and the mean age was 38 years. Body composition changed rapidly in PLWH and was strongly correlated with change in BP in PLWH but not in HIV-uninfected adults. Even after adjusting for changes in body composition, the BP in PLWH increased more rapidly than the BP in HIV-uninfected adults. In the fully adjusted model, PLWH experienced a 5.7 mmHg (95% CI: 3.6–7.7) greater increase in systolic BP and a 1.5 mmHg (95% CI: 0.3–2.8) greater increase in diastolic BP.
Conclusions: Although change in body weight is a predictor of change of BP in PLWH initiating ART, this indicator of return to health explained only part of the rapid BP increase experienced by PLWH. Other drivers of BP in PLWH deserve further investigation.

NCD27: Inflammatory phenotype differs in East Africa and Western Europe populations: the role of dietary metabolites

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Background: Research that assesses the variation of immune and metabolic characteristics across populations is sparse. Many communities in sub-Saharan Africa experience an epidemiological transition related to changes in lifestyle and diet, and this offers unique opportunities to increase our

understanding of the epidemiology of non-communicable diseases, including the effects of diet and environmental exposures.
Objectives: To examine differences in the inflammatory proteomes of healthy Tanzanian and healthy Dutch adults.
Methods: In this study, a cohort of 323 healthy individuals residing in Kilimanjaro, northern Tanzania, and 500 Dutch healthy volunteers of Western European ancestry were enrolled. We measured plasma inflammatory proteins using the Olink platform, untargeted plasma metabolomics, as well as circulating inflammatory cytokines and adipokines. Information on dietary intake frequency and type was also collected from all volunteers. Therefore, we used a systems biology approach to combine data from functional immunology and inflammatory proteins with data from the plasma metabolome.
Results: We show that healthy Tanzanians display a pro-inflammatory phenotype compared to Dutch individuals, with enhanced activity of the Wnt/b-catenin signalling pathway and higher concentrations of different metabolic regulators such as 4E-BP1 and fibroblast growth factor 21. Food-derived metabolites were identified as an important driver of variation in inflammation-related proteins among Tanzanian volunteers, which suggests that lifestyle changes could be important.
Conclusion: These findings endorse the importance of the current dietary transition and the inclusion of underrepresented populations in system immunology studies.

NCD28: Integrating HIV, diabetes, and hypertension services in Africa: a cluster-randomised trial in Tanzania and Uganda
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Background: Until about a decade or so ago, African health services were dealing principally with acute communicable diseases. HIV programmes in sub–Saharan Africa are well-funded and crucially over 60% of people with HIV-infection are in regular care with good viral suppression. The programmes for diabetes and hypertension are weak, and the burden of these conditions is rising where only 10%-20% of people with these conditions are said to be in regular care.
Objective: To assess the effectiveness of the integration of services for diabetes, hypertension, and HIV-infection.
Methods: A total of 32 primary care health facilities in Tanzania and Uganda were randomised to either integrated or standard vertical care in a 1:1 ratio. In integrated care, services are organised from a single clinic where patients with either HIV-infection, diabetes, hypertension, or combinations of these have access to the same waiting area, triage, and health information, managed by the same clinical team and use the same pharmacy and laboratory services. Standard care involves separate clinics as routinely conducted. The trial has 2 primary endpoints: retention in care of people with HIV, hypertension, diabetes, and plasma viral load suppression.

Preliminary results: Between March 2020 and April 2021, 7602 participants were screened of whom 7033(93%) were enrolled in the trial. 16 sites were randomized to the intervention arm and 16 sites to the standard of care arm. Of the participants enrolled, 3441(48.9%) were enrolled to Arm A and 3592(51.1%) enrolled in Arm B. About 50% of participants are less than 50 years old, over 70% of participants are female and about 20% of those enrolled had multiple conditions. Participants are still being followed up and are anticipated to complete follow-up in April 2022.
Discussion: This is the only randomised trial of its kind evaluating a one-stop integrated clinic for common high-burden diseases in Africa, designed to generate policy-relevant evidence on the re-organisation of chronic care services in Africa. These early findings could lead to identification of a sustainable and effective integration model and could result to substantially improved health services for these chronic conditions in resource poor settings.

NCD29: The association of Schistosoma and geohelminth infections with β-cell function and insulin resistance among HIV-infected and HIV-uninfected adults: a cross-sectional study in Tanzania
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Objectives: To investigate whether Schistosoma and geohelminth infections are associated with β-cell function and insulin resistance among adults.
Methods: A cross-sectional study was conducted among adults during 2016-2017. Demography, Schistosoma and geohelminth infections, HIV and insulin data were collected. Insulin during an oral glucose tolerance test (fasting, 30, and 120-min), overall insulin secretion index, insulinogenic index, HOMA-β, and HOMA-IR were the main outcome measures for β-cell function and insulin resistance, respectively. Generalized estimating equations and generalized linear models assessed the association of Schistosoma and geohelminth infections with outcome measures separately by HIV status. Outcomes were presented as marginal means with 95% CI.
Results: Data were obtained for 1718 participants. Schistosoma infection was associated with higher 30-min insulin (24.5 mU/L, 95% CI: 7.1, 41.9) and overall insulin secretion index (13.4 pmol/L/mmol/L; 3.8, 23.1) among HIV-uninfected participants but with lower fasting insulin (-0.9 mU/L; -1.6, -0.2), 120-min insulin (-12mU/L; -18.9, -5.1), and HOMA-IR (-0.3 mmol/L; -0.6, -0.06) among HIV-infected participants not yet on antiretroviral therapy (ART). Geohelminth infection was associated with lower fasting insulin (-0.9 mU/L; -1.7, -0.2), 120-min insulin (-9.1 mU/L; -17.3, -1.0), HOMA-β (-8.8 mU/L)/(mmol/L; -15.1, -2.4) and overall insulin release index (-5.1 pmol/L/mmol/L; -10.3, -0.1) among HIV-infected participants not on ART. There was no association among those on ART.
Conclusions: Schistosoma infection was associated with higher β-cell function among HIV-uninfected participants whereas Schistosoma and geohelminth infections were associated with reduced β-cell function among HIV-infected participants not on ART.

NCD30: The Effect of HIV Infection and Combination Antiretroviral Therapy on bone mineral density in a cross-sectional study in Northern Tanzania

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Background: Combination antiretroviral therapy (cART) has dramatically improved life expectancy among people living with HIV infection. Extended survival has exposed chronic health conditions or co-morbidities, including involvement of the musculoskeletal system. In high-income settings, diminished bone mineral density (BMD) has been observed, possibly resulting from host, viral and cART factors. However, little is known about bone disease in HIV-infected persons in sub-Saharan Africa.
Objective: To evaluate BMD in people living with HIV in Northern Tanzania.
Methodology: This was a cross-sectional study conducted at the Kilimanjaro Christian Medical Centre (KCMC). Convenience sampling was used to recruit study participants, and all provided written informed consent. Study participants underwent standard chest X-rays using Dicom Version 3.6.19-11.fc25. Clavicular cortical bone thickness was measured, and BMD was calculated using Anburajan's Empirical Formula. The Anburajan score is a validated measure of BMD, with normal density defined as a score of 0.9-1, osteomalacia 0.81-0.9, and osteopenia <0.8. Demographic data were obtained by using a standardized questionnaire and clinical data were extracted from the Electronic Health Management System. Data were entered with SPSS version 22, then transferred into STATA version 14 for analysis. Categorical variables were summarized using frequencies and proportions, and numerical variables using means and standard deviations. T-tests were used for comparisons, and Fisher's exact and chi square tests compared categorical variables. An F-test was used for comparisons of normal, osteomalacia and osteopenia scores. Logistic regressions were performed to obtain crude and adjusted odds ratios between scores and sets of explanatory variables. P-values of less than 0.05 were considered significant.
Results: This study included 188 study participants. The majority of the study participants were aged ≥ 45 years (141; 75%) and were female (142; 75.5%). A large majority (78.2%) had at least 6 years since HIV diagnosis, and 45.2% had taken cART for at least 6 years. A majority had viral loads < 1000 (122; 64.9%), and most had CD4 counts of ≥ 200 (121; 64.4%). Many were taking tenofovir as a component of their cART (135; 71.8%). Thirty-seven participants had a history of a bone fracture, (20%). The majority of participants (101;53.7%) had Anbujaran scores in the normal range, but 73; 38.8% had osteomalacia and 14; 7.5% had osteopenia.
Conclusion: In comparing demographic and clinical characteristics between those with and without a history of fracture, only a smoking history was significant (P=0.028). In an analysis by F-test of characteristics with grouping of scores into normal, osteomalacia, and osteopenia, a number demonstrated significant associations.

NCDP1: Validity of the FINDRISC as a prediction tool for diabetes in the Tanzanian population

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Background: The prevalence of type 2 diabetes (T2D) is increasing in all populations worldwide. Early detection of T2D through screening improves length and/or quality of life and saves health resources. The Finnish Diabetes Risk Score (FINDRISC) is a recommended tool for type 2 diabetes prediction. There is a lack of studies examining the performance of the current 0–26 point
FINDRISC scale in Tanzania.
Objective: To examine the validity of FINDRISC in the Black Tanzanian population.
Methods: We conducted a cross-sectional study in September 2021 in Mbeya. A random sample of male and female black volunteers without known diabetes aged ≥18 years was recruited. Screening for diabetes mellitus was done using the FINDRISC tool, and then fasting blood glucose was performed. The diagnostic accuracy of FINDRISC to detect undiagnosed pre-diabetes and diabetes was evaluated using the area Under Receiver Operating Characteristics Curve. The optimal cut-off points were determined by the point with the closest distance to (0, 1) in the ROC curve which maximizes the sensitivity and specificity of the test. All statistical analyses were carried out using Stata software, release 14.0. The significant level was set at 5%.
Results: The mean age of participants was 35.5 (± 11) and majority were male (55.1%). At the convectional cut-off of ≥ 15 the FINDRISC tool had a sensitivity of 8.9% (CI; 3.68-17.6), specificity 98.3% % (CI; 95.7-99.5), PPV of 63.6% (CI; 30.8-89.1) and a NPV of 76.6(CI; 71.4-81.2).
Conclusion: FINDRISC tool had very low sensitivity in our population. There is a need to develop a new tool with high sensitivity for step one community screening for diabetes. The step one screening using risk tools is more cost effective than using FBG tests.

3. Nutrition, reproductive, maternal, neonatal, child and adolescent health

The United Nations Sustainable Development Goal (SDG) 3, aims to ensure healthy lives and promote well-being for all at all ages, Nutrition, Maternal, Neonatal, Child and Adolescent health are key indicators of the overall health status and socio-economic growth and development. Accelerated and concerted global and local efforts are being taken to improve adolescents' health and well-being, address malnutrition in all its forms and maternal and neonatal deaths.

Despite the recent progress in improving adolescents' health and reducing maternal and child mortality over time, adolescents still experience poor quality of life, and unacceptable maternal, neonatal and child deaths persist. Globally, it is estimated 1.2 million adolescents die each year, mostly from preventable causes. Similarly, almost 295,000 maternal deaths that occurred globally due to treatable conditions during pregnancy and childbirth, and almost 94% of these deaths happened in low- and lower-middle-income countries (LMICs). Additionally, neonatal deaths account for approximately 46% of all deaths among children aged 5 years and younger.

In Tanzania, it is estimated maternal mortality ratio increased from 454 per 100,000 live births in 2010 to 556 deaths per 100,000 live births in 2016 (TDHS 2010; 2016). About 8,500 Tanzanian women die annually from pregnancy-related causes (UNFPA, 2012; Guttmacher Institute, 2013). Unsafe abortion represents one of the leading causes of maternal deaths in the country. The under-five mortality rate declined from 81 deaths per 1,000 live births in 2010 to 67 deaths per 1,000 live births in 2016. The declining trend of fertility rate has been observed from 5.4 in 2010 to 5.2 in 2016 live births per woman. In 2016, a sizeable proportion of women aged 15-19 (27%) had begun childbearing of which 21% had a live birth (TDHS 2010; 2016).

The world is also experiencing the double and triple burden of malnutrition, with individuals, particularly women and children, suffering from more than one form of malnutrition. Malnutrition is linked with poverty and in the past, it was primarily characterised by undernutrition and micronutrient deficiencies. However, currently, it affects both the poor and the rich, with the poor being affected more, thus facing triple burden of malnutrition especially underweight, micronutrient deficiencies and overweight/obesity.

Due to the above scenario, multidimensional and context-specific evidence is critical in the efforts to end inequities underlying preventable malnutrition, poor adolescent health, and maternal, newborn, and child deaths, thus achieving the health-related targets of the 2030 Sustainable Development Goals. In this session findings of evaluation of various maternal, neonatal, and adolescent health interventions and studies that looked at the epidemiology of these conditions.

NAMH1: Anaemia prevalence and knowledge among secondary school adolescents in Kibaha Town Council, Tanzania

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Background: Anaemia is one of the micronutrient deficiencies affecting adolescents. The main contributing factor is the unmet demand for iron for rapid growth, development, and physiology.
Objective: To determine anaemia prevalence and knowledge among secondary school adolescents.
Methodology: A cross-sectional study was conducted in March 2020 which involved adolescent girls and boys from 6 public schools. A haemoglobin (Hb) assessment for detecting anaemia was performed using a Hemocue portable hemoglobinometer. The Hb cut-off points for girls and boys were 12.0 and 13.0g/dL, respectively. Four levels of anaemia knowledge were classified as high (81% to 100%), medium (61% to 80%), low (41% to 60%) and poor (≤40%).
Results: About 461 adolescents (70% girls and 30% boys) took part in the study. A total of 361 adolescents (78% girls and 22% boys) were tested (Hb). Adolescent girls (49.8%) had significantly higher anaemia prevalence compared to adolescent boys (20.0%); P value=0.000. Six in ten anaemia cases among adolescent girls and boys were mild anaemia. Anaemia was also significantly higher among menstruating girls (52.5%) than non-menstruating girls (33.0%); P-value =0.000. Adolescent girls had higher anaemia knowledge which was increased by the level of the classroom than boys, Pearson Chi2 =0.025. Low dietary intake of iron and other vitamins rich foods was ranked moderate while increasing demand for iron and infections were ranked as low factors contributing to anaemia. Prevention measures that were ranked high, low, and poor were the use of fruits and vegetables and the use of meat products and iron folic supplements, respectively.
Conclusion and recommendation: Anaemia among adolescent girls is a severe public health issue of concern. There is inadequate knowledge of anaemia causes and prevention measures among adolescents. Nutritional intervention for addressing anaemia in adolescents should consider gender differences and the knowledge gap.

NAMH3: Perceived impact of TWAWEZA, a menstrual sexual and reproductive health intervention: lessons for PASS-MHW formative study in Kilimanjaro region

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Background: Partnering to Support Schools Promoting Good Menstrual Health and Well-being (PASS-MHW) project addresses a critical evidence gap in how to comprehensively combat menstrual and broader puberty-related challenges of adolescent secondary school girls in Tanzania.
Objectives: This formative study phase explored the impact of the Twaweza intervention from the implementers and beneficiaries' perspectives, specifically asking about their experiences and suggestion in order to identifying strength, areas of improvement in the on-going project for the purpose of refining the intervention.
Methods: Data was collected from purposely selected participants who were part of the TWAWEZA program. Data collection methods key informant interviews with implementers, in-depth interviews with teachers and focus group discussions with students.
Preliminary Results: Improved menstrual health related knowledge and capacity, access to safe and hygienic menstrual products and improved school attendance and participation. Girls were freer to discuss puberty and menstrual related issues with external facilitators. However, lack of involvement of boys and limited involvement of stakeholders such as parents, teachers and local government officials, and few education sessions were the main bottlenecks of the intervention. A number of changes to the intervention were recommended including increasing number of sessions, involvement of boys, teachers and parents and include more discussion on pain management strategies.
Conclusion: Multi-components menstrual sexual and reproductive health intervention has potential to improve knowledge of puberty and menstruation, access to menstrual products and increase knowledge of pain management strategies for girls in these schools and improved school attendance and girls' participation in class. However, such intervention needs to include engagement of keys stakeholders for a broader improvement of school environment.

NAMH4: Implementers' experiences of delivering a parenting programme to reduce violence against children in Tanzania: Lessons learned from the scale-up

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Background: There is considerable evidence suggesting that parenting programmes reduce violence against children (VAC). Based on this evidence, there have been calls for implementation of parenting programmes at scale. However, most of the existing evidence on implementation quality and scale-up

comes from high-income countries and very little research ascertains the perspectives and experiences of programme implementers from low-income settings.
Objective: To explore the views and experiences of implementers from six non-profit organisations who delivered Parenting for Lifelong Health for Teens (PLH-Teens) programme at scale in Tanzania in 2020 and 2021.
Methods: This paper employed a qualitative research design involving 44 in-depth interviews and 12 focus group discussions (FGDs) with facilitators, coaches, and local implementing partners (LIPs). Data were collected on implementers' experiences of delivering the programme at scale by exploring topics including programme delivery, training and support they received and details around programme logistics. All interviews and FGDs were audio-recorded with the permission of the participants. With the aid of NVIVO 12 qualitative analysis software, thematic analysis was used to synthesise the interview and FGD data.
Results: Thematic analyses of the interviews and FGDs revealed three themes: 1) implementers' reflections on factors promoting scale-up; 2) implementers motivation for implementation of the programme; and 3) barriers to scale up. Implementers described factors that promoted successful scale up as: planning and working closely with community organisations, which enhanced trust and buy-in; delivering the programme through role plays; and delivery by skilled implementers. Implementers were motivated to deliver the programme at scale for reasons such as prestige/respect, financial incentives, and acquiring skills for their own parenting. This study highlights barriers to programme scale-up as: conflicting demands on staff time; beneficiaries' initial doubt of the programme's value; COVID-19 related disruptions; and logistical challenges that affected how both implementers and parents/caregivers engaged with the programme. Despite these obstacles, implementers remained flexible in scheduling and adapting the programme to ensure successful completion.
Conclusion: This paper highlights the perspectives of staff implementing a parenting programme aiming to reduce VAC at scale. The study suggests that several factors support staff in delivering the programme whereas other factors hindered successful implementation. It is important for all programme stakeholders to understand these factors and find ways of addressing them for desired programme impact. The study also reveals that the successful delivery of parenting programme should allow for flexibility in modes of delivery by allowing for necessary adaptations and adjustments.

NAMH5: Menstrual sexual and reproductive health needs among students in Mwanza: preliminary findings from PASS-MHW formative study
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Background: Negative menstrual experiences is associated with poor health and social outcomes including poor participation in schools (including poor performance and participation when in school, and high rates of school absenteeism and dropout). Together these issues present barriers to many girls and undermine progress towards many of the Sustainable Development Goals [#1-6, 8,10-13,16,17].
Objectives: To assess WASH situation and menstrual sexual and reproductive health needs among students in secondary schools in Mwanza region.
Methods: We utilized qualitative participatory methods of data collection including key informant interviews with teachers in charge with hygiene and health, combined with observation of school

WASH facilities, teachers' meetings, one in each school; and FGDs with students, two in each school, disaggregated by gender.
Results: Most students considered relationship between students and teachers to be of poor quality making it difficult to consult or seek counsel on matters of puberty and menstruation. Menstrual related shaming, bullying, and teasing were every common, often done by the students and even the teachers. Data show significant unmet need for menstrual sexual and reproductive health education among students. MSRH education is currently provided through the ordinary level biology curriculum. However, the teachers were not trained to deliver such education, the delivery was ad hoc and not standardized. Teachers report uneasiness teaching MSRH topics and students reported general discomfort learning such topics from teachers. Students preferred being taught by external facilitators instead of their own teachers. Observations and FGDs with girls revealed lack of access to menstrual products and safe and hygienic WASH facilities to manage menstruation while in school.
Conclusion: Poor school climate including limited access to quality menstrual absorbent materials, poor WASH facility in school, bullying and teasing, and insufficient knowledge of puberty and menstruation remain major barriers to girls achieving their education potential, calling for a more comprehensive MSRH intervention.

NAMH6: Barriers and enablers to young female sex workers accessing HIV services in Tanzania: perspectives of health providers and young female sex workers
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Background: Despite being at an increased risk of violence and HIV infection, young women who sell sex, may not easily access HIV services. The objective of the study is to explore views of health providers and young female sex workers (YFSWs) themselves on barriers and enablers to accessing HIV services in Tanzania and to offer insights to enhance access.
Methods: This study utilized an ethnographic research design involving six SRH programme implementers and photovoice with 10 Young Female Sex Workers (YFSWs) aged 18-24 years. Thematic analysis was conducted with the aid of NVIVO qualitative analysis software.
Results: Health providers reported common SRH services available in their communities as HIV testing and treatment, contraception, and STIs treatment. Barriers to accessing HIV services among YFSWs were stigma as a result of the young age of the women as well as their engagement in sex work; lack of differentiated type of services for adolescents and YFSWs in the communities; limited preferred contraception options. Enabling factors were reported as: Service providers supporting girls to access SRH services through peer groups; respect and trust built between health providers and YFSWs; prompt service provision to YFSWs when they come to facilities; localization of services to where YFSWs operate and making these services available for 24 hours.
Conclusions: There is a need to address health provider-related barriers to YFSWs accessing HIV services while emphasizing the promotion of the factors that promoted uptake such as localization of services and 24-hour access.

NAMH7: Male and female narratives of childhood abuse in Mwanza Tanzania
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Background: Child abuse is a global problem with devastating health consequences. It is also one of the risk factors for the perpetration and experience of Intimate Partner Violence (IPV). There is paucity of insights on childhood abuse from men and women in low-income countries such as Tanzania. Yet such information is crucial for developing appropriate interventions.
Objectives: To explore the lived experiences of childhood violence of men and women in Mwanza. To examine narratives of their children's experiences of violence within the family context, and those of other children in the community, and their health effects.
Methods: We conducted in-depth interviews with purposively sampled 18 women and 30 men in different localities of Mwanza city. Participant's age range was 22 to 61 years. Same sex researchers conducted the interviews using semi-structured interview guides. The data was coded using NVivo software and analyzed through a multistage inductive process.
Results: Participants recounted about their own experiences of childhood violence while growing up. The violence came from their parents, relatives, or opposite sex adults. Women reported sexual abuse from older men leading to some dropping out of school, becoming pregnant and early childhood marriages. They also reported that their male partners abused their children. Main causes of childhood violence were parent's infidelity and alcohol abuse, family's economic difficulties, early engagement in sexual acts, negative social norms about children's upbringing and discipline, youth drug abuse and negative impact of internet and social networks. These resulted into four main forms of violence: physical, psychological, economic, and sexual abuse.
Conclusions: Interventions addressing childhood violence and IPV must address both personal and structural factors propelling violence. There is a need to explore the deep-rooted connections between violence experience and perpetration in the life course of children.

NAMH8: HIV status disclosure and related factors among children Aged 6-14 Years living with HIV in Kilimanjaro Region, Tanzania

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Background: In Tanzania, disclosure of HIV status to children remains a challenge despite WHO recommendation that states; children should be informed about their HIV status at ages 6 to12 years. We aim to determine factors associated with HIV status disclosure to children living with HIV (CLHIV) in Kilimanjaro, Tanzania.
Method: A cross sectional study using mixed methods was conducted from September 2021 to February 2022 among children aged 6-14 years receiving HIV care in Kilimanjaro region. Semi-structured questionnaires were used to collect socio-demographic data and reasons of non-disclosure. We in-depth interviewed children that were disclosed, caregivers of children disclosed and not disclosed. Bivariate and multivariate Logistic regression analysis were performed to identify factors associated

with HIV status disclosure and P<0.05 was considered statistically significant. Qualitative thematic content analysis was used to determined experience of status disclosure.
Results: Out of 121 children, 51(42%) had been told their HIV status. Children (86%), above 12years were told their HIV status compared to 28% among children 6-12 years (P<0.001). The disclosure among girls was 43% and 41% for boys (P=0.8). On ART treatment children <5years were 30%, while 53% were above 5 years (P=0.01). Disclosure status for those with a treatment supporter was 57% and 28% for those without treatment supporter (p=0.002). In the final multivariate model, HIV disclosure was more likely in children aged above 12 years compared to those aged 6-12 years (OR= 13.5; 95%CI= 4-46) and children who have a treatment supporter (OR=2.8; 95%CI=2-7). Themes from forty IDIs were: (1) importance of early disclosure, (2) challenges of disclosure to children, and (3) feelings when finding out about HIV.
Conclusion: HIV status disclosure to CLHIV in Kilimanjaro region was associated with higher age and having a treatment supporter. New strategies should be introduced in Health facilities to ensure that children know their HIV status as recommended by the WHO.

NAMH9: Social support and life experiences among adolescents living with HIV (ALHIV): A mixed methods study conducted in Kilimanjaro, Tanzania

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Background: Tanzania has an HIV prevalence of 2% among adolescents aged 15-19. Despite having good access to lifelong ART, ALHIV have poor adherence to medication. Social support is key for PLHIV to better manage the disease and lead a normal life possible.
Objective: To describe social support and general life challenges faced by ALHIV in Kilimanjaro, Tanzania due to their HIV status.
Methods: We conducted a cross-sectional study using mixed methods from September 2021 to March 2022. Using semi-structured questionnaires, adolescents aged 15-19 years receiving HIV care from four health facilities in Kilimanjaro were interviewed to measure social support and faced life challenges due to HIV. We conducted in-depth interviews with purposively selected adolescents until data saturation. Data was analysed descriptively. P value < 0.05 was considered scientifically significant. We used thematic contents analysis for qualitative data.
Results: We included 142 adolescents, 20 interviewed in-depth. Adolescents had mean of 10.1(SD 5.0) years in HIV care. 76(53.5%) were male, 125(88%) had closer supportive person, while 51(36%) had people that collected medication for them in case they could not. 110 (78%) adolescents were part of peer support groups and 101(71%) received HIV education from those groups. 29 (20%) adolescents were in a relationship, 16(55%) of them did not disclose their HIV status to their partner. Among 19 adolescents (13%) that reported facing difficulties due to status, 13(68.4%) were girls. Gender was significantly associated with facing difficulties due to HIV (p=0.039). Themes from IDI were (1) the need for reminders to take medication and clinic visits, (2) peer support groups, (3) financial support, (4) difficulties in disclosing to new closer person and (5) fear of unwanted disclosure at the workplace.
Conclusion: Most ALHIV are getting social support from close family and peer support group members that they have disclosed to. However, they face difficulties when needing to interact in an unfamiliar environment and have not disclosed their status. Support systems that target adolescents in various levels are needed to assist them with each stage of life so they can better manage their HIV status.

NAMH10: Adolescent-Nutrition-and-Health: formative assessment of the School-Health Environment and Programs in Ethiopia, Sudan, and Tanzania

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Background: 90% of adolescents live in low-and-middle-income countries. They are affected by injuries, malnutrition, and diseases. Early adolescence (10-14 years) is a critical phase for research and intervention. Intervening through schools where the majority of these adolescents are found, provides

an effective strategy for improving health. There is limited summative evidence linking policies and school-environments to related nutrition and health outcomes. This formative assessment sought to understand the policy surrounding school-health-environments, individual adolescent-health, and population-level risk factors relevant to the design, delivery and scale-up of nutrition and health interventions through schools.
Objectives: To assess the school-health and food-environment in Ethiopia, Sudan, and Tanzania on three levels: Policy environment and existing interventions; the school food-environment; and the nutritional and health state for in-school adolescents ages 10-14.
Methodology: Multi-stage cluster random sampling was used to select participating schools and students. Mixed-methods were used to assess adolescent nutrition, health, and school-food-environments among 3558 adolescent boys and girls and 52 teachers. National and subnational policies on adolescent-health in relation to school-health programs desk reviews and key informant interviews were conducted.
Results: Although national guidelines are in place, only 54%, 14% and 9% of the local authorities in Ethiopia, Tanzania and Sudan had adolescent-specific health-related policy, respectively. None of the schools provided deworming services in Ethiopia as compared to 43% in Tanzania. School feeding was provided in 90%, 24% and 18%; and drinking water in 70%, 71% and 36% of schools in Ethiopia, Tanzania, and Sudan, respectively. Although adolescents demonstrated understanding of healthy behavior and nutrition, their practice was limited to their socio-economic status and decision-making involvement.
Conclusion: Improving school age adolescent-health and nutrition surpasses school environment and policy. It requires interventions through curricula and community engagement, with results frameworks to gauge progress.

NAMH11: Harnessing longitudinal data to improve adolescent health in Tanzania
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Background: Approximately 25% of Tanga's population are adolescents, yet the region lacks key information in many areas of adolescent health. Until recently, adolescents have been overlooked in surveillance efforts and health policies, leaving an absence of information on risk factors and fewer health gains in this age group compared to others.
Objectives: To utilize a standardized survey among adolescents (aged 10-19 years) to collect key adolescent health indicators related to nutrition, sexual and reproductive health, mental health, physical health, health services utilization and substance use.
Methods: This cross-sectional baseline survey in Tanga employed a mixed method approach. A total of 1,031 in-school adolescents (10-19 years) from 20 schools, 20 school administrators, and 231 out-of-school adolescents from 8 hotspots participated. Descriptive analysis was conducted, and results presented in proportions and means with 95% confidence intervals. Subgroup analysis to assess variations in various dimensions of adolescents' health by gender and age was done.
Results: Findings showed that majority (69%) of all surveyed adolescents did not attain dietary diversity. Approximately 18% of the interviewed adolescents were stunted. 6% were underweight, 8%

were overweight. Moreover, 36% of the interviewed adolescents were found to be anaemic. About 45% of the adolescents preferred to receive sexual and reproductive health information from teachers, and 67% wished to have more classes on the topic. 7% of the interviewed adolescents reported to have ever tried smoking. Overall, 37% of adolescents reported to be physically active for at least 1 hour for 6 to 7 days of the week.
Conclusion: Survey results highlights key adolescent health and nutrition intervention areas for Tanga City. With these findings we recommend revamping of ongoing adolescent interventions per the national guidelines and local policies, gleaning from the health seeking behavior and preferred access points for Tanga in-school and out-of-school adolescents.

NAMH12: Prevalence and factors associated with under and over nutrition among in-school adolescents in urban Tanzania

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Background: Malnutrition is among major public health problems globally with the burden being higher in Asian and Sub-Saharan African countries including Tanzania. In rural Tanzania, a study reported that 18% of adolescents were stunted, 14% had thinness and 5.2% adolescents were overweight/obese. There is scarce understanding of malnutrition among adolescents aged 10-14 in urban Tanzania.
Objectives: To investigate prevalence and determine factors associated with stunting, underweight and overweight among adolescents in urban Tanzania.
Methods: A cross-sectional study analyzed data of 1,219 in-school adolescents aged 10 – 14 years in Dar es Salaam, Tanzania. Multivariable logistic regression determined factors associated with stunting, underweight and overweight. Analyses accounted for school-level clustering and associations were deemed statistically significant at p-value < 0.05 during adjusted analyses.
Results: Overall, 11.6% of adolescents were stunted, 7.8% were underweight, 8.7% were overweight and 4.3% obese, respectively. Average PDQS score was 18.1 (SD 3.2). Age, gender, and wealth quintiles were significant factors associated with stunting. Age, gender, and number of siblings in the household were significant factors associated with underweight. Gender, mother's occupation, and wealth quintiles were significant factors associated with overweight. Female adolescents were less likely to be stunted [AOR 0.68; 95%CI 0.47 – 0.98], less likely to be underweight [AOR 0.64; 95%CI 0.43 – 0.95] but more likely to be overweight compared to males [AOR 1.66; 95%CI 1.10 – 2.51]. The odds of being overweight significantly increased with increase in wealth quintiles among adolescents [AOR 1.85; 95%CI 0.09 – 3.81; trend p-value 0.013].
Conclusion: Tanzania is currently facing double burden of under and overnutrition. Among significant drivers to the double burden of malnutrition include age, gender, socio-economic status, and number of siblings in the household. There is an urgent need to revise health policies and interventions to curb this double burden of malnutrition and prevent associated diseases in adulthood.

NAMH13: Disparities in under five mortality rates in Kisesa Health and Demographic surveillance site: Evidence from women household survey

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Background: Despite greater than 70% decline of under-five mortality rates in Tanzania for the past 30 years (1990-2020), disparities by socio-economic status, geographical location and area of residence still exist. These disparities present as a barrier towards attaining the Sustainable development goal (SDG) targets in reducing under-five mortality rates to <25 deaths per 1000 livebirths by 2030. In order to achieve this goal, efforts are needed from the subnational level to minimize disparities and increase the annual reduction rate.
Objective: To determine the under-five mortality rates and disparities as obtained from the women birth histories in Kisesa health and demographic surveillance site.
Methods: This was a household cross-sectional survey conducted among 8,665 women of reproductive age from October 2020 to November 2021 at Kisesa Health and Demographic surveillance site. A shortened survey instrument was developed based on existing modules from the Demographic and Health Survey (DHS). The survey instrument was adapted to reflect the population and health issues relevant to Kisesa population. The data for child mortality estimation was obtained from a woman's birth history. Under-five mortality rates were estimated from the application of synthetic cohort life table approach. Mortality rates (per 1000 livebirths) for the two 5-years periods preceding the survey (2010-2015, 2016-2021). Disparities for the past 5 years preceding the survey disaggregated by area of residence, mother's wealth index and mother's education level were also computed.
Results: For the two five-year periods preceding the survey, under-five mortality rate declined by 10.3% from 40.9 (36.0, 45.9) to 36.9 (31.7, 42.2) deaths per 1000 livebirths. For the past five years preceding the survey, we notable differentials in under-five mortality by area of residence, mother's education, and mother's wealth index. Mortality rate significantly decreased by approximately 19 deaths per 1000 livebirths in urban areas compared to rural areas (27.1 vs 46.8 deaths per 1000 livebirths). Also, under-five mortality decreased with an increased mother's education level (63.2-No education vs 23.8-Secondary education and above deaths per 1000 livebirths), and with an increased wealth quintile (62.5- poorest vs 30.4-richest deaths per 1000 livebirths).
Conclusion: Inequalities in under-five mortality rates exist, with children residing in rural areas, born from mothers with no education and from poor households being at higher risk. Efforts such as planning of equitable services, interventions from the grassroots are needed to tackle these inequalities in order to ensure increased progress towards reaching goals to reduce under-five mortality in Tanzania.

NAMH14: Where and how do young people like to get their sexual and reproductive health (SRH) information? experiences from students in higher learning institutions in Mbeya, Tanzania: a cross-sectional study

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Background: Sexual and reproductive health (SRH) among young-adults in low- and middle-income countries is still a major public-health challenge. Early school-based sexuality education and information between teachers, parents and young-people have been protective against sexual health risks to which young-people are exposed. There is limited information on preferred choices of "where," "how" and "from whom" young people would like to receive SRH information. We describe preferences of young-people regarding SRH learning and communication with parents/guardians.
Methods: We conducted a cross-sectional study among randomly selected students aged 18-24y attending Higher Learning Institutions (HLIs) in Mbeya-Tanzania. We used self-administered questionnaire to collect information on SRH education received, ability to discuss SRH matters with parents/guardians and SRH information gaps during early sexual experience.
Results: We enrolled 504 students from 5 HLIs, 446(88.5%) reported to be sexually initiated with mean-age at sexual debut of 18.4y(SD 2.2). About 61% (307/504) of participants found it difficult to discuss or did not discuss SRH matters with parents/guardians while growing up. There was a strong gender-biased preference on SRH matters' discussions, participants preferred discussions with adults of their respective sex. Peers (18.2%), media (16.2%) and schools (14.2%) were described preferred sources of SRH information. On recalling first sexual experience, sexually initiated participants felt they needed to know more about sexual feelings, emotions, and relationships (28.8%), safer sex (13.5%), how to say 'No' (10.7%).
Conclusion: Young people have a gender preference when it comes to learning about SRH from their parents; however, such conversations seldom occur. There is a need to focus on building skills of parents and strengthening school curriculum on SRH matters so as to empower parents and teachers to confidently initiate and convey adequate SRH information.

NAMH15: The prevalence of sexually transmitted infections and risk factors among young adult females in Mbeya, Tanzania

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Background: STIs are currently the global public health problem with serious threat to the infected individuals, either with symptoms or asymptomatic. Most of these curable STIs are treated

syndromically and untreated cases cause chronic pelvic diseases with increased risk for HIV acquisition also complications in pregnancy and perinatal sequelae.
Objective: This was a cross-sectional study which insighted the prevalence and risk factors of 7-STIs from young adults' females.
Methods: This study was conducted from April 2020 to June 2021 whereby total of 170 urine and cytobrush samples archived at NIMR-MMRC, the specimen were randomly selected from collected from young adult women from various universities in Mbeya. Of which 150 were cytobrush and 20 urine samples, then extracted using Qiagen, detected with 7-essential STIs assay using multiplex CFX96 system. Data were analyzed using Stata 14 and GraphPad prism software.
Results: The overall prevalence of STIs was 81.33% of which 19.33% are public health important pathogens. The proportion of STIs co-infection with HPV was (28.67%) whereby 93% of women who were diagnosed with single or multiple STIs pathogens, never had sex and diagnosed STIs. More than 50% of females who were diagnosed with STIs pathogens they had no obvious STIs symptoms and 78% of all females had poor knowledge of STIs. Hence, Seegene multiplex is reliable in STIs diagnosis using cytobrush with sensitivity and specificity of 83.33% and 92.87% % respectively against CT/NG geneXpert in urine and cytobrush samples.
Conclusion: This study demonstrated high prevalence of STIs among young adult females who are vulnerable to STIs. The crude risk factors for STIs are gender, sex experience, age, knowledge, and residence. Most of STIs are asymptomatic with multiple infections; molecular diagnosis of STIs offers reliable and accurate results. Therefore, cytobrush specimen is superior in STIs diagnosis compared to urine. Further research is needed in the general population.

NAMH16: Altered lipid profiles and vaccine induced-humoral responses in children living with HIV on antiretroviral therapy in Tanzania

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Background: People living with HIV, even under therapy, have a high burden of age-related co-morbidities including an increased risk of dyslipidemia (which often predisposes to cardiovascular diseases) and immune aging.
Objectives: In this study, lipid profiles and antibody responses to measles and pertussis toxin vaccines were compared between ART experienced HIV+ children (n=64) aged 5-10 years, and their age- and sex-matched HIV- controls (n=47).
Results: Prevalence of high-density lipoprotein cholesterol (HDL-c) and triglyceride-driven dyslipidemia was higher among treated HIV+ children than in controls (51.6% vs 27.7% respectively, $p < 0.019$). In a multivariate Poisson regression model adjusted for age, sex and BMI, the association between low HDL-c, hypertriglyceridemia and HIV remained significantly high (for HDL-c: ARR: 0.89, 95% CI: 0.82 – 0.96, $p = 0.003$; for triglycerides: ARR: 1.54, 95% CI: 1.31 – 1.81, $p < 0.001$). Among HIV+ children, the use of lopinavir/ritonavir, a protease-based antiretroviral therapy was also associated

elevation of triglyceride levels (p = 0.032). Also, HIV+ children had a 2.8-fold reduction of anti-measles IgG titers and 17.1-fold reduction of anti-pertussis toxin IgG levels when compared to HIV- children.
Conclusion: Our findings suggest that dyslipidemia and inadequate vaccine-induced antibody responses observed in this population of young African HIV+ children might increase their risk for premature onset of cardiovascular illnesses and acquisition of preventable diseases.

NAMH17: Prevalence and factors associated with unsuppressed viral load among children below five years of age living with HIV in Mwanza, Tanzania.
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Background: Unsuppressed viral load which is strong indicator of treatment failure can lead to HIV related morbidity and mortality. Children below five years of age have increased risk of unsuppressed viral load due to various clinical and socio-demographic factors. The aim of the study was to determine the prevalence and factors associated with unsuppressed viral load among children below five years of age living with HIV in Mwanza, Northwest, Tanzania.
Methods: A cross sectional study involving children below five years of age who were on antiretroviral therapy (ART) for at least six months was conducted in four major care and treatment clinics (CTC) in Mwanza region from December 2020 to April 2021. Children were categorized as having unsuppressed HIV viral load if viral load count was more than 1000 ribonucleic acid (RNA) copies/mL. Data were collected using structured pretested data collection tool. Multivariate logistic regression analysis was done to identify factors associated with unsuppressed HIV viral load among children below five years of age.
Results: The mean age of 279 children below five years of age was 41.3 ± 12.7 months, and more than half 144 (52%) were female. More than two thirds 194 (69.5%) were biological mothers and mean age were 37.1 ± 12.4 years. A total, 20 (7.2%, 95% CI 4.2-10.2) had unsuppressed HIV viral load. The duration on ARVs less than 24 months (AOR 3.8, 95% CI: 50 1.2-12.0, P=0.026).

NAMH19: Impact and implementation feasibility of birth point of care HIV early infant diagnosis with fresh whole blood: preliminary results from LIFE study
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Background: HIV Early Infant Diagnosis (HEID) is widely performed by collecting dried blood spots (DBS), which are then sent to centralized laboratories for DNA PCR. The Point of Care (PoC) platforms offer the opportunity of using fresh blood samples for HEID, providing HIV results timely, and overcome challenges associated with DBS referrals.
Objective: To assess the implementation feasibility of PoC HEID Using fresh blood in Tanzania.
Methods: Data were obtained from infants born from HIV infected mothers in the ongoing LIFE Study. Children were enrolled at birth and had in the intervention arm (birth cohort) HEID test performed at

birth, and in the standard of care arm (SoC cohort) HEID test performed at 6 weeks of age. Participants in the SoC cohort had a dried blood spot (DBS) collected at birth to allow for later identification of infants who were infected at birth. Fresh heel prick blood samples were analyzed at the PoC by using Xpert-HIV-1 assay. Results: Between October 2019 to August 2021, a total of 2582 infants were enrolled in Mbeya, Tanzania; 1204 in the birth cohort and 1378 in the SoC cohort. Median birth weight was 3 kg and 1246(48.3%) were females. Overall HIV infection was detected in 18(0.89%) infants; 8(0.79%) in birth cohort and 11(0.98%) in the SoC cohort. In the birth cohort, the median time from birth to sample collection was 22.58[12.93, 31.67] hours, and from sample collection to result communication to caregiver was 2.42[1.97, 3.50] hours. In the HIV infected babies, the median time from birth to ART initiation was 0.29[0.14, 6.93] weeks in the birth cohort, and 9.07[7.29, 11.46] weeks in the SoC cohort. **Conclusion:** Our findings suggest that implementation PoC HEID at birth is feasible and results in a significant shortening of the timelines of ART initiation in HIV infected infants.

NAMH20: Facility-based care for low birth-weight infants in Dar es Salaam, Tanzania

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Background: In Tanzania and globally the is an increasing rate of facility-based childbirth that enables early intervention for vulnerable newborns. However, there is limited knowledge of facility-based feeding and discharge practices for low birth weight (LBW) infants, both of which have implications for clinical management and post-discharge outcomes.
Objective: To describe the current practices regarding the feeding of LBW infants in health facilities from birth to discharge and the facility level inputs that support or hinder optimal practices to inform future interventions.
Methods: The Low Birthweight Infant Feeding Exploration study is a mixed-methods observational study at three facilities in Dar es Salaam, Tanzania. We assessed the facilities for the various anthropometry equipment and feeding counseling and analyzed data from a facility assessment. We also undertook a prospective cohort of moderately Low Birth Weight (LBW) infants (1500-2499 grams) from birth to discharge.
Results: All facilities had weighing scales available, but length boards and head circumference tapes were not present at all facilities. All facilities had intravenous (IV) fluids and term formula; two facilities did not have preterm formula; cups for expressed breastmilk were available at all facilities but no facilities had breast pumps. A total of 40 LBW infants were followed, and the mean duration of hospital stay was 4.5 days (Range 1-16.5 days). In the facility, 82.5% of mothers reported ever receiving counseling on breastfeeding prior to discharge, the median (Interquartile range) number of times mothers reported being counselled on feeding in the facility was 1.5 times (1.0, 3.5). In terms of discharge, 16 of 40 (40%) infants were discharged with a weight <2000g, but all were stable.
Conclusions and recommendation: Targeted LBW-specific lactation support, confirming appropriate weight prior to discharge, and ensuring supplies to support breastfeeding feeding and growth monitoring may position LBW for successful feeding and growth.

NAMH21: Disability and Intimate Partner Violence (IPV) among women: a cross-sectional study from Mwanza, Tanzania

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Background: Evidence indicates that women with disabilities are at heightened risk of experiencing intimate partner violence [IPV], although the mechanisms through which disability acts as a risk factor for IPV are unclear, and evidence is limited. This study aimed at describing the prevalence of disability and its association with IPV amongst women.
Methods: 867 women completed a structured questionnaire that included measures of physical, sexual, emotional, and economic IPV and controlling behaviours from the WHO Multi-Country Study instrument. Levels of disability (low, medium, high, and severe) were categorised based on responses to the Washington Group Short Set questions covering vision, hearing, mobility, cognition, self-care, and communication. We fitted binary logistic regression models to determine the association of experiencing IPV according to disability level and type of disability.
Results: The prevalence of physical, sexual, emotional, economic IPV and controlling behaviour was 17.3%, 15.0%, 48.0%, 39.1% and 66.8% respectively. While for disability; low=46%, medium=19%, high=8% and severe=0.3%. Across all levels of disability, we found significant associations with different types of IPV. For example, women who reported a medium level of disability were significantly more likely to experience physical and sexual IPV [AOR: 1.45, 95%CI: 1.02 – 2.07] than women who did not report any disability. Sexual and economic IPV were consistently associated with several levels and types of disability. Women reported having a cognitive disability had significantly higher odds of experiencing all forms of IPV, with the highest odds being exposure to economic IPV [AOR: 2.18, 95%CI: 1.50 – 3.18]. In contrast, vision disability was not significantly associated with any type of violence.
Conclusions and recommendation: Our findings suggest that specific types of disability may be associated with an elevated risk of IPV exposure, indicating the need for nuanced measurement and analysis of the association between disability and IPV. Given low levels of severe disability identified in this study and other studies in LMIC, there is a need for dedicated surveys to assess different types and levels of disability and IPV risk.

NAMH22: Conducting mobile phone interviews with women in Tanzania: lessons from the MAISHA COVID-19 IPV study

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Background: The COVID-19 pandemic has affected millions of people worldwide. This made it difficult for face-to-face data collection in ongoing research studies. Hence, innovative data collection methods are critical to avoid interruptions in critical research studies with vulnerable population to inform interventions and policy. The study was nested in the MAISHA cohort, a four-wave longitudinal study of 445 women on intimate partner violence in Mwanza, Tanzania.
Objectives: To explore the impact of COVID-19 on women's physical, psychological, and economic well-being. We also investigated their experiences of Intimate Partner Violence (IPV).
Methods: We conducted 18 phone based in-depth interviews with purposively sampled women. The interviews were audio-recorded and transferred to computers for analysis. In addition, we conducted longitudinal phone-based interviews with 445 women using a structured questionnaire. 443 (97%) of the women were re-interviewed after 3 months.
Results: Participants reported no different experience of being interviewed by phone compared with face-to-face interviews. They were free to report sensitive information including their experience of COVID-19, IPV, and relationships with their intimate partners. The phone interview methodology was considered more private and time efficient. Interview lasted for 30-40 minutes. The method has additional advantages as it is reduces research costs from travel and ensures safety of both researchers and study participants. Challenges included audibility, unstable network, and unreachable phones.
Conclusions: It is feasible to conduct mixed methods phone interviews in the Tanzanian setting. Researchers should explore using this method frequently to conduct longitudinal studies in the country. Training of research teams is crucial for the successful use of such methods.

NAMH23: Prevalence of sexual assault and use of emergency contraceptives among female commercial sex workers in Dodoma city, Central Tanzania: a cross-sectional study

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Background: Female Commercial Sex Workers (FCSW) are at constant risk of being abused by their customers or community. The increased rate of unwanted pregnancies signifies the problem in preventive measures and emergency contraception. This study aimed to assess the prevalence of sexual assault and emergency contraceptives among female commercial sex workers in central Tanzania.
Methods: A descriptive cross-sectional study was conducted on 326 female commercial sex workers with a simple random sampling technique in 10 administrative wards of Dodoma city. The selection of 10 wards from 41 total wards was performed systematically through excel.

Results: Majority (58%) were aged between 21 and 31years whereby more than half of the participants (51.8%) had experienced sexual assault. The majority of study respondents (64.4%) had never used emergency contraceptives. There was a significant relationship between the use of emergency contraceptives with a variable like ever being pregnant (p=0.002), ever used drug of abuse (p<0.001), level of education (p=0.009), and ever heard about emergency contraceptives (p<0.001). In multivariate analysis the following were determinants of emergency contraceptives use among female commercial sex workers were level of education; ordinary secondary education (AOR=0.373 at 95% CI=0.158-0.878, p=0.024), College level of education (AOR=0.131 at 95% CI=0.036-0.469, p=0.002), ever used drug of abuse (AOR=0.197at 95% CI=0.197-0.608, p<0.001) and ever heard about emergency contraceptives (AOR=6.2 at 95% CI=3.443-11.17, p<0.001).
Conclusion: FCSW suffers a significant sexual assault in their daily work. Most of them had never used emergency contraceptives which predisposed them to unplanned pregnancies. A combination of intervention in sexual assaults and emergency contraception needs to be directed to the community and FCSW. Also, intervention to change health care workersand#039; attitudes towards FCSW, availability of contraceptives, and easy accessibility to the health care system to increase the uptake of emergency contraceptives. All the barriers to emergency contraceptives should be addressed to facilitate their consumption.

NAMH24: Exploring the impact of a targeted couples IPV program on their children
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Background: Children living in households where there is intimate partner violence (IPV) are at increased risk of maltreatment, which is associated with a range of poor health outcomes. There is considerable interest in whether existing interventions targeting IPV have 'spill over' effects on child maltreatment. UZIKWASA, a civil society organisation in Pangani, has developed a targeted intervention for couples in conflict, combining intensive reflective workshops with ongoing coaching to address IPV.
Objective: As part of a larger study looking at the broader impacts of the UZIKWASA intervention package, we explored its impact on children of a sample of participating couples.
Methodology: In-depth interviews were conducted with adolescent children (14-17 years) of five couples who participated in the intervention and analysed using a mixed deductive/inductive approach.
Results: Adolescents narrated different challenges they encountered in living in households with IPV, which included worries about their parents' relationship. They described how this interfered negatively with their health and well-being. Examples include mental distress (e.g., sadness, irritability), changes in eating and sleeping patterns, mood changes, and lower academic performance. They also talked about the positive impacts of their parents' participation in the UZIKWASA intervention. Less conflict and more positive communication between parents improved the household environment in general, leading to several positive changes. These included increased concentration on school activities resulting in improvement in academic performance, improved mental and emotional stability, learning of new communication skills and household routines including eating and sleeping schedules, and increased trust in parents.

Conclusions and recommendations: This analysis reveals the wider benefits of the UZIKWASA couples' programme on children's physical and mental health. There is a need to utilise existing interventions to address the need for integrated violence prevention programmes, including fully understanding the 'spill over' effects of IPV and violence against children programming.

NAMH25: Men's lives outside their homes and Intimate Partner Violence, Mwanza-Tanzania

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Background: Intimate Partner Violence (IPV) has several health consequences such as mental health and injury. Engaging men is important for addressing IPV, especially in low-income contexts. Understanding men's lives and interactions outside of their homes and how it influences their intimate relationships will strengthen interventions.
Objectives: We explored different activities which men do away from their homes. We examined their social interactions and networks and how these influence their relationships with their female partners, including IPV.
Methodology: We conducted in-depth interviews with 30 purposively sampled men residing in Mwanza. The sampling considered the diversity of their demographics. Subsequently, 16 of the men participated in photovoice and were re-interviewed after taking pictures about their lives. Participants captioned their photos and ranked them according to what was important to them. We analysed the interview transcripts and photos inductively.
Results: The analysis identified five main categories of activities that men do when away from their homes: (i) income-generating activities, (ii) recreational and social activities, (iii) worshipping or religious activities, (iv) meeting parents and other relatives, (v) and establishing or maintaining extra-marital relationships. With the exception of the last activities, there was evidence that they could lead to a reduction or increase in intimate partner violence, depending on the main pathways. Through four main pathways: (i) time spent with family, (ii) use of economic resources, (iii) the application of social and religious normative beliefs, and (iv) proven or suspected infidelity, these activities and social interactions either led to different forms of intimate partner violence or improved relationships.
Conclusions: Insights from men's lives outside of their homes and socio-economic interactions should inform the design of interventions to engage men. Learning from the pathways connecting the activities and social interactions of the men should be core to such interventions.

NAMH26: Conceptualization of sexual harassment in North-western Tanzania: the role of consent, male power, and social norms

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Background: Sexual harassment is associated with negative sexual and mental health outcomes. There is a lack of clarity on its conceptualization in many settings, especially in low-income countries. Context-specific conceptualizations of sexual harassment is vital to develop effective measurement tools, estimate its magnitude and to develop interventions to address it. We explored how different population groups in Tanzania understood, conceptualized, and experienced sexual harassment.
Methods: This study employed a qualitative research design involving 74 in-depth interviews and 13 focus group discussions with participants from educational, workplace and public settings in Mwanza, Tanzania. Participants were adolescent girls (n=28) and boys (n=26) in and out of school; adult women (n=10) and men (n=10) in workplace and public spaces. We explored individual level perceptions and experiences of sexual harassment, and community norms and perceptions around sexual harassment. We used thematic analysis to analyse the transcripts.
Results: Participants' perceptions of sexual harassment emphasized the critical role of consent, the expression of male power and social norms with regards to sexual harassment. Sexual harassment was understood to be a result of men being in positions of power and in charge of material resources, school grades or employment opportunities. These in turn enabled them to take advantage of girls and women. The place and person involved in the act of harassment were important in defining the practice. The types of sexual harassment varied from blurred/unclear acts of unwanted/displeasing behaviours to clear sexual abuse and exploitation practices such as rape, forced sex or violence. Social norms around male and female interactions, courtship and seduction, expressions of sexual interest were crucial in delineating what was and what was not considered sexual harassment.
Conclusion: Sexual harassment is a fluid concept. Consent and power in relationships underpin the conceptualization of sexual harassment and is a fundamental feature in the definition and measurement of sexual harassment in Tanzania. Consent is largely determined by sexual norms around male and female interactions and gendered power. There is a need for consensus in schools, workplaces, and communities about what constitutes sexual harassment in order to measure and address it appropriately.

NAMH27: Advancing Respectful Maternal Care (RMC) initiatives and advocacy in Tanzania

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Background: Studies in Tanzania and beyond have documented disrespect and abuse of women during childbirth in health facilities. Evidence suggests such mistreatment can lead to poor health

outcomes, reduces trust in the health system, and impacts future care-seeking. Progress in Tanzania includes increasing awareness and recognition of mistreatment, development of policies and guidelines as well as attempts to implement interventions to advance respectful care. However, there is less available and accessible evidence around what to do and how to address it. To complement existing efforts in this field, there is a pressing need for implementation evidence.
Objective: To support implementation science activities with potential to accelerate the integration and scale-up of innovative policy and program approaches for advancing RMC in Tanzania.
Methods: Diverse HEARD Project approaches have been used to advance implementation, monitoring, dissemination of evidence, and policy advocacy around RMC in Tanzania. A special RMC task force was established to re-initiating discussions with relevant stakeholders as well as identify and prioritize strategic opportunities for RMC improvement through workshops, capacity building and evidence dissemination.
Preliminary Results: Workshops for enhancing capacity for evidence dissemination through case studies have been held among key RMC implementers including policy makers, healthcare providers and development partners. Tanzania RMC related evidence and information has been made accessible through an online platform. Also, a workshop was held with key stakeholders to discuss how, and which indicators could be introduced and integrated into the HMIS and DHIS2 to track and measure services in relation to RMC.
Conclusions: Accepting that RMC is an issue for Tanzania is a huge accomplishment. The RMC Task Force – with HEARD Project's support and collaboration with the Government and development partners – is advancing RMC improvement from multiple ends and is yielding results thereof as described herein. Innovative efforts are to be employed for better achievements.

NAMH28: Impact of mother mentors' model to improve retention in PMTCT services in health facilities supported by Global Funds. A case from CSSC-AMREF, Tanzania

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Background: Mentor Mothers (MMs) are women living with HIV who provide peer support to other HIV-positive women. MM programs have been incorporated into PMTCT programs in several African countries including Tanzania with some success. Christian Social Services Commission in Collaboration with AMREF Africa is implementing a three-year PMTCT Project under the support of Global Funds for eight regions (Arusha, Lindi, Pwani, Morogoro, Tabora, Shinyanga, Mwanza and Geita) through community model called mother mentors.
Objective: The objective is to improve the uptake and impact of PMTCT services at the rural areas and non-supported health facilities in eight regions.
Methods: We trained 606 mother mentors in eight regions for ten days based on the national PMTCT mother mentor's curriculum in June and July 2021. Selection criteria of mother mentors was being HIV positive, knows how to read and write, ready to disclose HIV/AIDS status to fellow HIV positive mother and willing to make follow of mother baby pair at the community level. They were given monthly monitoring and evaluation tracking tools. Health facilities supervisors supervised them.

Results: After three months of implementation mother mentors managed to link to care 494 PMTCT clients of whom had been lost to follow up, 446 clients were linked to Psychosocial and income generating activities (PSAG). 136 PSAG groups comprising of 940 members were formed, of these, 582 were PMTCT members. Formation of IGA was formed with collaboration of Community HIV/AIDS Coordinators of respective regions.
Conclusion: Mother mentors' models improve retention of mother baby pair between community and health facilities level. They need to be supervised and supported both technically and financially to be able to assist PMTCT cascades at the community setting.

NAMH29: The determinant and effect of postpartum depressive symptoms on maternal-infant bonding among postpartum mothers: a cross-sectional study in Dar es Salaam, Tanzania
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Background: The bond that a mother feels towards her baby is critical to a child's social, emotional, and cognitive development. Postpartum depressive symptoms (PDS) have been associated with a decrease in the quality of the Maternal-infant bond (MIB), which leads to a long-term negative impact on a child's behaviour and health in general. However, the factors determining these relationships remain unknown in many low-income countries. Therefore, this study assessed the determinants, association between dimensions of PDS and MIB, and the effect of PDS on MIB among postpartum mothers.
Methods: A cross-sectional study was conducted among postpartum mothers. A systematic sampling technique was used to obtain study participants. The PDS was assessed by Edinburgh Postpartum Depressive Scale. MIB was assessed by Postpartum Bonding Questionnaire (PBQ). Descriptive and inferential analyses for collected data were performed using (SPSS) version 25, with a statistically significant p-value < 0.05.
Results: A total of 407 postpartum mothers were enrolled in the study. Their age ranged between 18 to 45 years. The prevalence of PDS and the impaired (MIB) were 24.8% and 15.7%, respectively. Maternal age and the mode of delivery were significantly associated with MIB (p-values = 0.007 and 0.016, respectively). The level of PDS was significantly associated with the severity of MIB ($p \leq 0.001$).
Conclusion and recommendation: This study demonstrates a high prevalence of PDS and impaired MIB in Tanzania. The high prevalence of PDS affects MIB. Age and mode of delivery were found to be the determinants of MIB. The study findings call for efforts to increase access to comprehensive client-centered management of PDS and MIB. Further qualitative studies are recommended so to capture in-depth views from the participants.

NAMH30: No association between fertility desire and HIV infections among men and women: Findings from community – based studies before and after implementation of an early ART initiation program in the rural district of North-western Tanzania.
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Background: Fertility is associated with the desire to have children. The impacts of HIV and ART on fertility are well known, but their impacts on the desire for children are less well known. We report the fertility desire among men and women and the association with HIV infection and other characteristics.
Methods: The secondary data analysis focussed on participants aged 15 – 49 years, in 2012 and 2017, in the Magu Health and Demographic surveillance system population, in Tanzania. Information on fertility desires, HIV status, and social–economic and demographic variables collected from the two studies were analysed. Fertility desire was defined as whether or not the participant wanted to bear a child in the next 2 years. The main analysis used log-binomial regression to assess the association between fertility desire and HIV infection.
Results: A total of 5221 and 5730 participants aged 15-49 years provided data from the 2012 and 2017 studies, respectively. In the 2012 study, 43% (95% CI 40.7-45.3) of men and 33.3% (95% CI 31.8 - 35.0) women wanted another child in the 2 years. In 2017 the percentage rose to 55.7% (95% CI 53.6 - 57.8) in men and 41.5% (95% CI 39.8 - 43.1) in women. Although fertility desire in men and women were higher in HIV uninfected compared to HIV infected, age-adjusted analysis did not show a statistical significance difference in both studies (2012: PR=1.02, 95%CI 0.835 - 1.174, p<0.915 and 2017: PR = 0.90 95%CI 0.743 - 1.084 p= 0.262).
Discussion: One-third of women and forty percent of men desired fertility in 2012, while forty percent of women and nearly half of the men desired fertility in 2017. The data showed fertility desire, in 2012 and 2017 were not related to HIV infection.

NAMH31: Fertility trends by HIV status in a health and demographic surveillance study in Magu District, Tanzania, 1994-2018

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Background: Sub-Saharan Africa (SSA) has the highest fertility and HIV disease burden globally. However, it is not clear how the rapid expansion of anti-retroviral therapy (ART) for HIV has impacted on the fertility gap between HIV infected and uninfected women.
Objective: We used data from a Health and Demographic Surveillance System (HDSS) in north-western Tanzania to explore trends in fertility rates and relationship between HIV and fertility over the 25-year period.
Methods: From 1994 to 2018, births and population denominators from the HDSS population were used to obtain Total Fertility Rate (TFR). HIV status was extracted from eight rounds of Epidemiologic Serological surveillance (1994 – 2017). Fertility rates by HIV status and levels of ART availability were compared over time. Independent risk factors for fertility changes were examined using the Cox proportional hazard models.
Results: There were 24,662 births from 36,814 women who contributed a total of 145,452.5 Person-Years of follow-up. TFR declined from 6.5 births per woman in 1994-1998 to 4.3 births per woman in 2014 - 2018. The number of births per woman was 40% lower in women living with HIV compared to HIV-uninfected women (4.4 vs. 6.7) although this difference narrowed over time. The fertility rate in HIV uninfected women was36% lowering 2013 – 2018 compared to 1994 – 1998(age-adjusted HR=0.641; 95% CI 0.613 - 0.673). In contrast, the fertility rate in women living with HIV was relatively unchanged over the same period (age-adjusted HR=1.099; 95%CI 0.870 – 1.387).
Conclusions: There was a notable fertility decline among women in the study area from 1994 to 2018. Fertility remained lower in women living with HIV compared to HIV-uninfected women, but the

difference continued to narrow over time. These results highlight the need for more research into fertility changes, fertility desire and family planning use in Tanzanian communities.

NAMH32: Puerperal sepsis-related knowledge and reported self-care practices among postpartum women in Dar es salaam, Tanzania

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Background: Knowledge and reported self-care practices of postpartum women are important for early detection, prevention, and treatment of puerperal sepsis.
Objectives: To analyse the knowledge and self-care practices for prevention of puerperal sepsis and their determinants among postpartum women.
Methods: A hospital-based analytical cross-sectional study which included 343 postpartum women was conducted from February to March 2021. Data were collected using interviewer-administered questionnaire. Predictors of knowledge and self-care reported practice were determined using binary logistic regression. $p < 0.05$ was considered significant.
Results: More than half (n = 213, 62.1%) of the postpartum women had adequate knowledge on prevention of puerperal sepsis. Only 39 (11.4%) of the women reported adequate self-care practices toward prevention of puerperal sepsis. Secondary education (adjusted odds ratio = 0.18, 95% confidence interval = 0.06–0.49, p = 0.001), tertiary education (adjusted odds ratio = 0.52, 95% confidence interval = 0.19–1.38, p = 0.021) and getting information from healthcare providers (adjusted odds ratio = 1.06, 95% confidence interval = 0.55–2.06, p = 0.049) were significant determinants of knowledge on prevention of puerperal sepsis. Also, secondary education (adjusted odds ratio = 0.11, 95% confidence interval = 0.04–0.30, p = 0.001), tertiary education (adjusted odds ratio = 0.16, 95% confidence interval = 0.06–0.39, p = 0.001), and having more than four antenatal care visits (adjusted odds ratio = 1.21, 95% confidence interval = 0.49–3.27, p = 0.041) were significant determinants of reported self-care practices for prevention of puerperal sepsis.
Conclusion: A significant gap in reported self-care practices to prevent puerperal sepsis was evident. Secondary and tertiary education were significant predictors for both knowledge and self-care reported practices. Special attention should be given to women with low education level.

NAMH33: Perceptions of health care workers on the implementation of accountability mechanisms for quality improvement in maternal health care in Mkuranga Tanzania

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Background: Globally, 302,000 maternal deaths occur annually; more threatening is that 99% of them happen in low and middle-income countries, including Tanzania. There has been insufficient progress in improving maternal and new-born health; despite an investment of resources to enhance the quality of maternal health in training and deploying human resources for health, construction of health facilities, and medical products. However, fewer efforts are invested in enhancing Accountability towards improving the quality of maternal health care.

Objective: To explore the perceptions of healthcare workers regarding accountability mechanisms for enhancing quality improvement in the delivery of maternal new-born and child health services in Tanzania.
Methods: The study adopted a qualitative approach, whereas phenomenology was used as a study design to understand how health workers perceive Accountability data were collected using semi-structured interviews, and we used thematic analysis to analyse themes and sub-themes.
Results: Findings showed differences in the conceptualization of accountability and accountability mechanisms among the participants; some view it as adherence to ethics and procedures. We highlighted several tools for enhancing quality improvement in the delivery of maternal health services; clinical meetings, tracking attendance, maternal audits, ward, and rounds. Health care workers perceived accountability mechanisms as useful for inculcating the spirit of hardworking in the delivery of maternal health services. However, without solving health systems bottlenecks like the inadequate supply of medical equipment and insufficient human resource for health, it will be difficult to enforce accountability mechanisms.
Conclusion: Perceived variations in the understanding of Accountability among healthcare workers signalled a proper but fragmented understanding of Accountability in maternal care.

NAMH34: Determinants of health facilities' capacity to provide quality in-patient new-born care: a case study of neonatal care units in Mtwara region, Tanzania
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Background: Globally, approximately ¾ of new-born mortalities (NMs) occur within the first week of birth, and ¼ occur within 24 hours before discharge. Prematurity, infections, and birth asphyxia account for over 80% of global NM. Prompt and appropriate care including antibiotic prophylaxis, oxygen and surfactant therapy, thermal protection, feeding, and resuscitation can reduce NMs. The establishment and running of Neonatal Care units (NCUs) at the admitting health facilities (HFs) provides an avenue for needy new-borns to be admitted and managed. Therefore, this study evaluated the factors influencing the establishment and functionality of NCUs in the provision of quality in-patient new-born care (IPNC) to inform continuous improvement to accelerate NMs reduction.
Methods: A cross sectional study was conducted using a follow up explanatory mixed methods approach. The main study unit was an admitting HF where HF-based records and the characteristics that allows for the delivery of IPNC services were reviewed. Outcomes within each parameter were clarified through interviews with healthcare stakeholders to identify factors influencing the quality of IPNC provision at the HFs. The investigation was guided by a framework for maternal and neonatal care quality.
Results: At least one NCU room was dedicated for the delivery of IPNC services in 12 (70.6%) HFs. Approximately 4819 (32.6%) of needy new-borns were admitted to NCU for management. Tetracycline eye ointment was unavailable in 90.3% of HFs. There was a mismatch between the availability and functioning of infant radiant warmers (92% vs 73%). Governance and access to resources were identified as key determinants of quality IPNC service provision.
Conclusion: The establishment and performance of NCUs in Mtwara were sub-optimal. This study recommends further scope in the establishment and improvement in the functionality of NCU, not only in Mtwara but also in other similar settings.

NAMH35: Prevalence, patterns and associated factors for neural tube defects among young infants admitted at Bugando Medical Centre in North-western Tanzania

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Background: In Africa, including Tanzania, the trend for neural tube defects (NTDs) has been increasing, and shown to increase morbidity and mortality in young infants. At Bugando Medical Centre (BMC)-a tertiary hospital serving the population of North-western Tanzania, the cases of NTD are commonly reported, but its exact prevalence, patterns and associated factors in young infants admitted at BMC remain unknown.
Objective: To determine the prevalence, patterns, and associated factors for NTD among young infants admitted at BMC.
Methodology: A cross-sectional observational study involving young infants aged 0-3 months admitted at BMC was used. Ethical approval and clearance to conduct the study was obtained from relevant authority before beginning the study. A census sampling technique used to ensure all young infant with and without NTD who consented are involved. A questionnaire-administered was used to collect information from the infants' mothers. Data were managed using Microsoft Excel database and were cleaned and imported to STATA version 13 for analysis. Multivariate logistic regression analysis done, significant levels was set at p-value less than 0.05.
Results: A total of 525 young infants enrolled in the study from February to May 2021, of which 298 (56.8) were male. NTDs was found in 73 (13.9%) of the 525 infants hospitalized at BMC, and the most common pattern was myelomeningocele 50(68.5%). Failure to use folic acid supplementation during preconception and early first trimester, living in rural residence, lower education and overweight during pre-conception period are the key factors associated with NTD among young infants.
Conclusion: This study demonstrated that NTD is one of the prevalent conditions contributing to admission among young infants at BMC.
Recommendation: The use of folic acid supplement in preconception should remain emphasized to all women of reproductive age at all levels and NTDs should be taken as a public health problem.

NAMH36: The association of physical activity and capacity with β-cell function, insulin resistance and diabetes among adults' population in North-Western, Tanzania.

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Background: Research on the associations of physical activity and cardiorespiratory fitness with β-cell dysfunction and insulin resistance among adults in Sub-Saharan Africa is limited.
Objective: To assess the association of physical activity and cardiorespiratory fitness with β-cell function, insulin resistance and diabetes among people living with HIV ART-naïve and HIV-uninfected Tanzanian adults.
Methods: In a cross-sectional study, we collected data on socio-demography, anthropometry, and C-reactive protein. Data on glucose and insulin collected during an oral glucose tolerance test were used to assess β-cell dysfunction, insulin resistance, prediabetes and diabetes which were the dependent variables. Physical activity energy expenditure (PAEE), sleeping heart rate (SHR), and maximum

uptake of oxygen during exercise (VO2 max) were the independent variables and were assessed using a combined heart rate and accelerometer monitor. Logistic regressions were used to assess the associations.
Results: Of 391 participants, 272 were PLWH and 119 HIV-uninfected. The mean age was 39 (±10.5) years and 60% (n=235) were females. A 5 kj/kg/day increase in PAEE was associated with reduced risk of lower insulinogenic index (OR=0.94, 95%CI: 0.88, 1.01) and of higher HOMA-IR (OR=0.89, 95%CI: 0.83, 0.96), and with lower risk of pre-diabetes (RRR=0.88, 95%CI: 0.88, 0.94) and diabetes (RRR=0.65, 95%CI: 0.52, 0.82). An increment of 5 beats per min of SHR was associated with higher risk of diabetes (RRR=1.34, 95%CI: 1.08, 1.60). An increase of 5 mLO2/kg/min of VO2 max was associated with lower risk of pre-diabetes (OR=0.63, 95%CI: 0.48, 0.84), but not diabetes. HIV status did not modify any of these associations (interaction, p>0.05).
Conclusion: Among Tanzanian adults with and without HIV, habitual physical activity was associated with lower risk of β-cell dysfunction, insulin resistance and diabetes. Research is needed to assess if physical activity interventions can improve β-cell function and insulin sensitivity to reduce risk of diabetes and delay progression of diabetes in SSA.

NAMH 37: Low birthweight infant feeding practices and growth patterns in the first six months of life

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Background: LBW infants face increased risks for mortality, morbidity, neurodevelopmental impairments, growth faltering as well as challenges related to breastfeeding.
Objectives: To describe the feeding profile of low birthweight infants in the first half of infancy and to examine growth patterns and early risk factors of poor growth outcomes at six months.
Methods: The LIFE study was a multi-site, observational cohort study. Data were collected data from birth to six months for LBW infants recruited from health facilities in Dar es Salaam, Tanzania as well as India and Malawi.
Results: In Tanzania, only 4.9% of LBW infants-initiated breastfeeding within the first hour of life and 52% were exclusively breastfed (EBF) to six months of age. Further, 57% of mothers of LBW infants reported feeding difficulties during the first 6 months and 80% reported having received breastfeeding counselling at the facility. In terms of growth of LBW infants in Tanzania, 15% did not regain their birthweight by two weeks of age; and at 6 months of age 35%, 21% and 7% were stunted, underweight, and wasted, respectively. Infants not regaining birthweight by two weeks had a greater risk for stunting at six months. Finally, there was no relationship between EBF duration to six months and growth outcomes at 6 months.
Conclusion and recommendation: Breastfeeding initiation and duration of exclusive breastfeeding among LBW infants was suboptimal and their risk of poor growth was high. Given that regaining the birth weight by 2 weeks had a temporal relation to stunting, while no relationship between EBF with growth was found, interventions beyond promoting EBF alone in the earliest days of life are needed

and breastfeeding behaviors (frequency and volume), milk quality, maternal nutrition, and other interventions should be evaluated.

NAMH38: Vitamin A supplementation surveillance system evaluation.

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Background: Vitamin A is an important micronutrient in the human body that is key in vision and immune functions. Vitamin A supplementation (VAS) is one of the more effective ways of preventing vitamin A deficiency that has been used and proven for years. Vitamin A routine supplementation surveillance system provides a way to monitor supplementation for children who were not reached by supplementation given through campaigns. campaign.
Methods: CDC MMWR guidelines were used to evaluate the surveillance system attributes using data from January 2021 to December 2021 found in the MNIS and DHIS2. Health care workers at sampled facilities in Shinyanga municipal and Kahama who work in vitamin A supplementation, regional and council nutrition officers as well as data clerks were interviewed. System attributes were evaluated using indicators that were then graded according to the number of indicators evaluated.
Results: The system was able to keep track of all children who get VAS as well as able to add information about children who did not get VAS in campaign. The system allowed the policymakers to access the system information and respond. Of the 6 health facilities visited, none have been trained on the surveillance system. All health facilities had the required books for recording VAS although books were improperly filled. Data quality was only 82%. Data was timely reported into system but 17% of the monthly reports missed records in MNIS as compared to DHIS. The system is fully donor dependent.
Conclusion: The surveillance system generally meets its objectives and is very useful in keeping a record and tracking the children who did not get VAS during campaign. For it to thrive it needs to be strengthened by proper documentation and regular reporting as well as stabilizing the supply of vitamin A supplements in health facilities.

NAMH39: Improving maternal and adolescent nutrition in Tanzania

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Background: Adequate nutrition is essential particularly for women of reproductive health because inadequate nutrition impairs women's own health and health of their unborn children. About 45% of women of reproductive age and 57% of pregnant women in the country were found to be anemic in a survey (TDHS 2015-16). Although 98% of women received antenatal care from skilled providers, only 51% have four or more ANC visits as recommended.

Objectives: To; assess the nutritional status of pregnant women attending ANC clinics; evaluate health facility compliance to national guidelines on the provision of maternal and nutritional services; determine patient and provider satisfaction and perception on the current maternal and health services.
Methods: This survey used quantitative data collection methods covering six districts of Mbeya Region. Data were collected from 78 health facilities providing antenatal care where 2183 women (pregnant and breastfeeding), 78 health care providers, and 156 Community Health Workers were surveyed.
Results: Overall, about 38% of women in the surveyed Mbeya districts were anemic. Most participants reported having their weight measured (96.1%) and had abdominal examinations (94.1%). Urinalysis was reported to be the least performed examination (51.9%). More than half of the women (57%) received nutritional counselling. Majority of pregnant women (98%) were satisfied with the quality of ANC services provided. Half of the CHWs (50%) reported not having required resources for their job and majority (80%) of them were not satisfied with their stipend.
Conclusion: The findings show variation in levels of anemia among pregnant women, access to food; nutrition practices and determinants of ANC care utilization. Social Behaviour Change Communication (SBCC) interventions are required in the community to promote healthy diet at family level and at the facilities to promote maternal nutrition counselling, strengthening the importance of ANC attendance completeness and food fortification.

NAMH40: Older siblings' role in infant and young child feeding and care in rural Tanzania
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Background: Nutrition interventions aimed at improving infant and young child feeding (IYCF) and care in low and middle-income countries (LMIC) generally targets mothers as primary caregivers, ignoring roles and relationships of other family members.
Objectives: To identify siblings' caregiving activities for younger children (0-18months) and circumstances associated with care and to evaluate sibling caregivers' tasks through a newly developed sibling questionnaire and identify determinants of sibling engagement in IYCF care.
Methodology: A sub-study within the Engaging Fathers for Effective Child Nutrition and Development in Tanzania (EFFECTS) cluster-randomized trial examined older siblings' role in IYCF and care in rural Tanzania. Inductive and deductive analyses of qualitative data found siblings played a significant role in IYCF and care around school schedules when mothers had other household responsibilities.
Results: Results from qualitative interviews guided the development of a sibling IYCF and care questionnaire that was administered to mothers (n=959) and siblings (n=352, 7-17 years) at the trials. Half of the households (51%) indicated an older child aided in infant care. Engaged siblings were young (median 10 years) and predominantly female (61%). Care included feeding (84%, specifically snacks (43%) and beverages (83%), responsive care (86%), hygiene (69%), and care during illness (25%), such as giving medicine (9%). Most sibling caregivers (60%), especially girls and older children ($p<0.001$), helped in food preparation. Female siblings also had more involvement in hygiene-related tasks, while older children had greater involvement in hygiene and caring when sick ($p<0.001$).

Conclusion: To our knowledge, this is the first investigation of older siblingsand#039; role in IYCF and care in a low-resource setting. Nutrition interventions should incorporate the substantial role of older siblings in IYCF and care.

NAMH41: Occurrence and associated risk factors of aflatoxin B1 and aflatoxin M1 contamination in feed and raw milk in three agroecological zones of Tanzania

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Background: Aflatoxins are natural toxic compounds produced by a specific type of fungi, which cause severe contamination of foods and feeds. They may cause potential carcinogenicity (mutagenicity, hepatotoxicity, immunotoxicity) to humans and livestock. Objective: This study assessed the awareness, occurrence, and associated risk factors of aflatoxin B1 (AFB1) in livestock feeds and aflatoxin M1 (AFM1) in raw cow milk in the Mpwapwa, Serengeti, and Hai districts of Tanzania. **Methods:** A total of 419 smallholder dairy farmers (SDFs) were surveyed (Hai 137, Mpwapwa 147, and Serengeti 135). A total of 141 raw milk samples (45, 48 and 48 in Hai, Mpwapwa and Serengeti, respectively) and 80 livestock feed samples (Hai, 50 and Mpwapwa 30) were collected from the SDFs. The livestock feed samples were collected from 26 surveyed agrovet dealers Hai 11, Mpwapwa 11, and Serengeti 4. Feeds and milk samples were analysed by using High-Performance Liquid Chromatography (HPLC).
Results: Low awareness of aflatoxins was observed in all districts (Hai 26.3%, Mpwapwa 25.2%, Serengeti 17.8%), and 50.0% among the agrovet dealers. AFB1 in feeds from agrovet dealers and SDFs ranged from 88.5 – 86.2% with a concentration ranging from a limit of detection (LOD) to 22.99 and 32.9 µg/kg. AFB1 contamination in feeds from the agrovet dealers and SDFs exceeded the EU and Tanzanian limits were 15.38% and 22.5% respectively. AFM1 in raw milk samples were 30.7%, with concentrations ranging from LOD to 43.98 µg/L, 27.9% of which exceeded the limits of the EU and Tanzania. The risk factors associated with AFB1 and AFM1 were cattle management systems, feed handling and storage practices, geographical locations, aflatoxin awareness, and level of education.
Conclusion and recommendations: Therefore, it is vital to increase awareness and knowledge about aflatoxins, good cattle management practices, and proper handling and storage of feeds among key stakeholders in the dairy value chain.

NAMH42: The choice of reference chart affects the strength of the association between malaria in pregnancy and small for gestational age: an individual participant data meta-analysis comparing the Intergrowth 21st with a Tanzanian birthweight chart

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Background: The prevalence of small for gestational age (SGA) may vary depending on the chosen weight-for-gestational-age reference.
Objective: We conducted an individual participant data meta-analysis assessing the implications of using a local reference (STOPPAM) instead of a universal reference (Intergrowth-21) on the association between malaria in pregnancy (MIP) and SGA.
Methods: We pooled data from 6,236 new-borns from seven conveniently identified studies conducted in Tanzania and Malawi from 2003–2018 with data on MIP, birthweight, and ultrasound estimated gestational age. We used mixed-effects regression models to compare the association between MIP and SGA. The odds ratios were adjusted for gestational age at enrolment and delivery, gravidity, maternal age, hemoglobin level, body mass index at enrolment, utilization of insecticide treated bednet, the number of antenatal visits, and syphilis or HIV-positivity.
Results: The 10th percentile for birthweights-for gestational age was lower for STOPPAM than for Intergrowth-21, leading to a prevalence of SGA-STOPPAM of 14.2% and SGA-IG21 of 18.0%, p<0.001. The association between MIP and SGA was stronger for STOPPAM (adjusted odds ratio (AOR) 1.30 [1.09–1.56], p<0.01) than for Intergrowth-21 (AOR 1.19 [1.00–1.40], p=0.04), particularly among paucigravidae (SGA-STOPPAM AOR 1.36 (1.09–1.71), p<0.01 vs SGA-IG21 AOR 1.21(0.97–1.50), p=0.08).
Conclusion and recommendations: The prevalence of SGA may be overestimated, and the impact of MIP on SGA underestimated when using Intergrowth-21. Comparing local reference charts to global references when assessing and interpreting the impact of MIP may be appropriate.

NAMH43: Obesity epidemic in urban Tanzania
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Background: Worldwide, the epidemiological and demographic transitions have resulted in a nutrition shift characterized by increased consumption of high-energy fast-food products. In just over 3 decades, overweight and obesity rates have nearly tripled to currently affecting over a third of the global population. Notwithstanding the ever-present under-nutrition burden, sub–Saharan Africa (SSA) is witnessing a drastic escalation of overweight and obesity.
Objective: To explore the prevalence and associated factors for obesity among residents of Dar es Salaam city in Tanzania.
Methods: Participants from this study were recruited in a community screening conducted during the Dar es Salaam International Trade Fair. Sociodemographic and clinical data were gathered using a structured questionnaire during enrolment. Dietary habits and anthropometric measurements were assessed using standard methods. All statistical analyses utilized STATA v11.0 software. Pearson Chi square and Student's T-test were used to compare categorical and continuous variables, respectively. Logistic regression analyses were used to assess for factors associated with BMI ≥ 25. All tests were 2-sided and p < 0.05 was used to denote a statistical significance.
Results: A total of 6691 participants were enrolled. The mean age was 43.1 years and males constituted 54.2% of all participants. Over two-thirds of participants were alcohol consumers and 6.9% had a positive smoking history. 88.3% of participants were physically inactive, 4.7% had a history of diabetes mellitus and 18.1% were known to have elevated blood pressure. Overweight and obesity were observed in 34.8 and 32.4% of participants, respectively. Among overweight and obese participants, 32.8% had a misperception of having a healthy weight. Age ≥ 40, female gender, current working status, habitual breakfast skipping, poor water intake, high soft drink consumption, regular fast-food

intake, low vegetable and fruit consumption, alcohol consumption and hypertension were found to be independently associated factors for obesity.
Conclusion: Amidst the ever-present undernutrition in SSA, a significant proportion of participants had excess body weight. Concomitantly, the rates of physical inactivity and unhealthy eating are disproportionately high in Dar es Salaam. In view of this, community-based and multilevel public health strategies to promote and maintain healthy eating and physical activity require an urgent step-up in urban Tanzania.

NAMH44: A comparative analysis of determinants of low birth weight and stunting among under five children of adolescent and non-adolescent mothers using 2015/16 Tanzania Demographic and Health Survey
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Background: Tanzania is one of the Sub-Saharan African countries with nearly 12 out of 60 million people being adolescent. The prevalence of child marriage is higher in Tanzania with one out of every three girls being married before reaching their 18th birthday, 5% being married by the age of 15 and 31% by the age of 18 years. Literature shows early pregnancy is associated with Low-Birthweight (LBW) and stunting among under-five.
Objectives: To explore the variation and factors associated with LBW and stunting among children born by adolescent and non-adolescent mothers.
Methods: Data from 13,266 women with children under-five years collected as part of the 2015/2016 TDHS was reanalysed using STATA-14 while accounting for survey design. A total of 6385 women (7.2% were adolescent) and 8852 women (6.7% were adolescent) were involved in the analysis of child-birthweight and stunting, respectively. Descriptive statistics stratified by maternal age was conducted with LBW and stunting as outcome variables followed by logistic regressions models controlling for confounding variables.
Results: Non-adolescent mothers had reduced odds of giving birth to LBW babies compared to adolescent mothers (AOR=0.34; 95%CI=0.22–0.50). Maternal undernutrition (AOR=2.29; 95%CI=1.43–3.67), being divorced/separated/widowed (AOR=1.76; 95%CI=1.24–2.50) and having at least four ANC visits (AOR=0.64; 95%CI=0.49–0.83) were significantly associated with reduced odds of having a LBW. Child stunting was not associated with maternal age. Maternal high socioeconomic status (AOR=0.69; 95%CI=0.57–0.84) and maternal obesity or overweight (AOR =0.77; 95%CI=0.64–0.92) were negatively associated with stunting. Childbirth-weight, sex, and age were significantly associated with stunting.
Conclusion: Maternal age was a predictor of LBW but not stunting. ANC attendance and not living with a spouse increased the risk of LBW babies. Stunting was associated with maternal overweight/obesity, low.

NAMH45: Mapping the cord blood transcriptome of pregnancies affected by early maternal anemia to identify signatures of fetal programming

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Background: Anemia early in pregnancy (EP) is a health concern in many low and middle countries, including Tanzania, with profound implications on fetal growth, size at birth and new-born survival. Infants born to mothers with anaemia early in pregnancy often surfers from poor foetal growth and reduced birthweight at delivery, both which increases risk for cardiometabolic diseases, including type 2 diabetes (T2D), later in life.
Objective: To elucidate mechanisms underlying developmental programming of adult cardiometabolic disease, including epigenetic and transcriptional alterations potentially detectable in umbilical cord blood (UCB) at time of birth.
Methods: We leveraged global transcriptome- and accompanying epigenome-wide changes in 48 UCB from new-borns of EP anemic Tanzanian mothers and 50 controls to identify differential expression of genes (DEGs) in UCB of infants exposed to maternal anemia EP. DEGs were assessed for association with neonatal anthropometry and cord insulin levels. These genes were further studied in expression data from human fetal pancreas and adult islets to understand their role in beta-cell development and/or function.
Results: The expression of 137 genes was altered in UCB of new-borns exposed to maternal EP anemia. These putative signatures of fetal programming, which included the birth weight locus LCORL, were potentially mediated by epigenetic changes in 27 genes and associated with neonatal anthropometry. Among the DEGs were P2RX7, PIK3C2B, and NUMBL, which potentially influence beta-cell development. Insulin levels were lower in EP anemia–exposed UCB, supporting the notion of developmental programming of pancreatic beta-cell dysfunction and subsequently increased risk of T2D in offspring of mothers with EP anemia.
Conclusions: Our data provide proof of concept on distinct transcriptional and epigenetic changes detectable in UCB from new-borns exposed to maternal EP anemia.

NAMH46: Maternal re-testing for HIV negative women in the context of elimination of maternal to child transmission of HIV/AIDS in the facilities supported by Global Funds- A Case from Christian Social Services Commission- AMREF, Tanzania

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Background: Tanzania is one of the 22 countries with the highest number of pregnant mothers living with HIV. Vertical transmission remains the principal route of new paediatric HIV infections despite the availability of effective interventions for the prevention of mother-to-child transmission (PMTCT) of

HIV. In Tanzania like other low- and middle-income countries, considerable improvements in PMTCT have been observed: Services are increasingly available in primary health centers and a growing proportion of HIV-positive pregnant women are accessing efficient combination antiretroviral treatment (ART). Christian Social Services Commission - AMREF under the support of Global Funds is implementing the PMTCT project in eight regions (Arusha, Lindi, Pwani, Morogoro, Tabora, Shinyanga, Mwanza and Geita) through a community model called mother mentors.
Objective: To improve maternal retesting among HIV negative women to prevent vertical transmission of HIV/AIDS.
Methods: The technical team in collaboration with regional and health managements teams, and health care workers during supportive supervision coaching and mentorship, reviewed Mtuha book number six, twelve and thirteen data from January to December 2021. What was observed was inadequate testing of maternal retesting during the week of 32 and 36, labour and delivery and during postnatal visit.
Results: Based on the data collected from Mtuha registers the findings shows that, 86,408 (98%) pregnant women attended their 1st ANC were tested for HIV/AIDS. Of these 15,599 (18.05%) maternal retests was done in the week of 32 and 36 of their gestation age. 8701(10.06%). 6198 (7.17%) maternal retesting was done during labour and delivery. Findings shows that there is a decrease of maternal retesting overtime. Reasons provided by health care workers was lack of awareness on the importance of maternal retesting during 32 and 36 gestation age and post-natal period. The RHMT/CHMTs and technical teams used maternal retest job aids to educate health care and pregnant and lactating women the importance of maternal test in all trimesters to prevent vertical transmission of HIVAIDS.
Conclusion: Uptake of Human Immunodeficiency Virus (HIV) re-testing among postnatal mothers who had previously tested HIV-negative is important for the detection of recent sero-converters who are likely to have high plasma viral loads and an increased risk of mother-to-child HIV transmission in Tanzania.

NAMH47: Income generation activities and psychosocial groups intervention Improved Stigma and discriminations among mother mentors attending PMTCT health facilities supported by Global Fund in Tanzania. A case from CSSC-AMREF, Tanzania

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Background: Income generation activities (IGA) is defined as an intervention which impart vocational skills that enhance the capacity of individuals to generate income. IGA among pregnant women living with HIV/AIDS they increase financial independence, feelings of self-confidence, power within relationships, making participants to negotiate safer sex, less dependent on exchanging sex for money. Little has been done on how IGA and Psychosocial groups can impact the livelihood and reduce stigma and discriminations among women living with HIV/AIDS in PMTCT units. Christian Social Services Commission (CSSC) GF PMTCT project has integrated the IGA and Psych social activities among mother mentors in the supported heath facilities in the eight regions. Based on the baseline

data done in April 2021. showed that, there were only four IGA and psychosocial groups in the supported regions.
Methods: This has been done through training of mother mentors on income generating activities through district Development Officers, who oriented mother mentors on how to identify their own activities in their locality, group identification, development of constitutions, opening of banks accounts. Income generation activities aimed to address structural factors associated with HIV risk among pregnant and lactating women living with HIV/AIDS in the supported GF PMTCT health facilities
Results: Within eight months of implementation CSSC GF PMTCT developed 147 IGA and psychosocial groups with 985 members of pregnant and lactating women and HIV positive women in the supported regions. In line with income generating activities mother mentors used their monthly allowances to transform their livelihood such as renovating their houses, buying plots, building their new houses. Similarly, mother mentors through IGA groups they are also members of Psychosocial support groups which is done hand by hand with IGA meeting at the PMTCT clinic.
Conclusion: There are potential benefits of being in IGA and Psychosocial groups among mother mentors and other PMTCT members such as retention in care, reduced lost to follow up, reduce psychological stress, Adherence to PMTCT services, reduced stigma and discrimination, reduced risky sexual behaviour and disclosure of HIV-positive status to sex partners, improved quality of life like improvement in symptoms, improved confidence and self-esteem, better coping skills, and perceived reduction in stigma.

NAMHP1: Analysis of correlated outcomes of anthropometric measurements for children under-five years in Tanzania
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Background: In Tanzania, stunting, wasting and being underweight are still health problems facing children under-five years of Age.
Objective: To examine factors associated with correlation outcomes, in particular, anthropometric measurements among under-five children in Tanzania, to improve the health status of a child.
Methods: TDHS-MIS 2015-16 datasets were used for analysis. The Multivariate Generalized Linear Mixed Model was used to jointly model three anthropometric measurements, i.e., Weight for Age, Height for Age and Weight for Height among under-five children in Tanzania. A total of 9,052 children with valid measures of Height and Weight were processed and analysed.
Results: indicate that Weight for age was correlated with Height for age (p-value < 2e-16) and Weight for height (p-value< 2e-16). The Multivariate Ordered Logit Model has lower AIC=53213.92 and BIC=52727.95, indicating better model fit than the Multivariate Ordered Profit Model. Age of the child, Birth order, Mother education level, Sex of the child, mother working status, wealth index, marital status and mother body mass index are key determinants of malnutrition among children under-five years in Tanzania.
Conclusion: Emphasis should be placed on analysing nutrition outcomes jointly to make inferences about the factors that might have a common effect on anthropometric measurements.

NAMHP2: Factors associated with anemia among public primary school pupils aged 5-19 years in Tanzania: A Case study of Pwani, Geita and Arusha Regions

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Background: Anemia, defined as a condition in which the number of red blood cells or the haemoglobin concentration within them is lower than normal and has been a health concern in developing countries like Tanzania. Primary school pupils are the most endangered groups of anemia. Anemia has a negative impact on one's well-being, rational growth, educational attainment, and job production if left untreated.
Objective: To determine factors associated with anemia public primary school pupils aged 5-19 years in Tanzania
Methods: A cross sectional survey involved 2,292 pupils from the selected regions. This study used secondary data from school malaria and nutrition survey (SMNS) conducted between August and October 2019 among public primary school pupils (5 to 19 years) in Tanzania. A Binary and Multinomial logistic regression models were used to assess the possible association of independent and the outcome variables.
Results: Anemia was higher (33%) among primary school pupils aged 15-19 years (COR=1.35, 95%CL: 1.11, 2.12). compared to the pupils aged 5-9 years. This implies that r school-age pupils falling into age group 15-19 years are at higher risk of developing mild anemia as compared to the school-age children falling on age group 5-9 years of age. Most of pupils who were malaria positive found to be anemic (COR=1.67, 95%CL: 1.23, 2.27). Anemia (mild) was less common among pupils who were living in urban area (COR= 0.57, 95%CL: 0.41, 0.80) compared to rural area.
Conclusions: Malaria positive, rural resident and elderly age group of pupils (5 to 19 years) were among the major factors associated with anemia among public primary school pupils in the study area. The government need to establish proper measures and policies that will help to control and reduce prevalence of anemia among school pupils in Tanzania.

NAMHP3: Utilization of over-the-counter medication and Herbal Remedies during pregnancy among women attending postnatal clinics: a cross-sectional study in Mbeya City, Tanzania

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Background: Over the counter(OTC) medications are widely used to treat ailments during pregnancy. It is a genuine principle to avoid drug exposure during the first trimester when organogenesis takes place when harmful exposure may lead to structural abnormalities and other adverse effects. In recent years, an escalating inclination towards use of OTC medication has been observed owing to drugs accessible in pharmacies and retail outlets. Also, several pregnant women take herbal medicines in their period of pregnancy which resulted into poor maternal and fetal outcome such as obstructed labor, fetal distress. There are limited published studies done in Tanzania on OTC medicine and herbs use during pregnancy.
Objective: To assess the utilization of OTC medicines and herbs during pregnancy among women attending postnatal clinics in Mbeya.

Methods: This was a cross sectional study; post-delivery women aging 18 years and above who attended post-natal clinics from June to December 2019 in Mbeya region were interviewed. A semi structure questionnaire in Swahili language was used to collect information on utilization of OTC and herbal remedies.
Results: A total of 382 postnatal women responded to the questionnaires in ten postnatal clinics in Mbeya region. Use of OTC medication, herb medicines or both during pregnancy was common in 382(100%) women. Proportion of users were 72.8%,27.2% and 15.4% for OTC, herbal medicine and both medicine users, respectively. The use of medicines was more in the first trimester whereby common source of herbal medicine and OTC was the traditional herbalist and retail pharmacy, respectively. Majority (98%) of women used the medicines orally and the reported reasons for use included relief of nausea and vomiting, low cost, traditional use, and easy accessibility of medicines
Conclusion: The utilization of OTC and herbal remedies during pregnancy was found to be common in pregnant women in Mbeya. This provides area for further research to assess its effect on the pregnancy outcome.

NAMHP4: Premature new-borns follow-up in a semi-rural facility: A two years' experience at Tosamaganga Hospital

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Background: Globally, preterm birth is one of the leading causes of neonatal morbidity and mortality. The collection of proper follow-up data on preterm new-borns is crucial for providing effective care and reducing the risk of long-term disability.
Objective: To share the results regarding follow up adherence of infants born with a body weight less than 2500 g in a Tanzanian hospital.
Methods: We conducted a retrospective study, including infants with body weight at birth less than 2500 g who were admitted at Tosamaganga Hospital (Iringa Region) between January the 1st 2019 and December 31st, 2020. Follow-up visits were scheduled at one week and one month after discharge, and at three, six, twelve months of corrected age. We evaluated a total number of 366 patients, calculating the average number of attended follow-up visits and the dropout rate. Also, we stratified patients according to the body weight at birth (VLBW very low birth weight, i.e., 1500-1000 g, ELBW extremely low birth weight < 1000 g).
Results: The average number of attended follow-up visits was 2.5 per patient, with no significant differences between 2019 and 2020 (2019: 2.53; 2020: 2.5). The global dropout rate in 2019 and 2020 was 63.7% and 60.6% respectively. A higher dropout rate was founded among the littlest babies. Particularly, dropout rate among VLBW infants was 68.4% (2019) and 56% (2020), while the one among ELBW infants was equal to 100% both in 2019 and 2020.
Conclusions: This study showed a high dropout rate in preterm follow-up, which is consistent with the literature in low-income countries. No difference was noted between 2019 and 2020, despite of the COVID-19 pandemic. Further studies are needed to evaluate social, structural, and educational dropout related factors. Programs to improve follow up adherence of preterm infants are mandatory.

NAMHP5: Universal salt iodization surveillance system evaluation.
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Background: Iodine is an essential nutrient for humans and animals. Iodine deficiency disorders remain a major global health issue, affecting nearly 2 billion people worldwide and placing them at risk of irreversible brain damage, stillbirth, and cognitive impairment. Universal Salt Iodization (USI), which intends that all salt for human and animal consumption be iodized thus ensuring adequate iodine nutrition, was identified as the global strategy for the elimination of iodine deficiency, The USI surveillance system as the system of monitoring and evaluation of salts iodization in Tanzania, was established in TFNC in 2019 under TFDA as a means of eliminating IDD. Tanzania has reached the coverage of 61.2% of households consuming iodate salt while the global goal is 90%, Despite the low coverage in Tanzania.
Objective: To evaluate USI system in Tanzania (the system has never been evaluated Which is the reason I choose to evaluate it, the results from this evaluation will trigger father study in this system including evaluation in other regions of Tanzania mainland and Zanzibar).
Methodology: This evaluation was guided by the Center for Disease Control Updated Guidelines for Evaluating Public Health Surveillance System (MMWR) the study was conducted in the Kigoma region in march 2022 by reviewing documents used in the USI system, observation, and interview of the key informant. Data analysis was done by Microsoft excel and presented in tables and graphs.
Results: The system was found to be satisfactory useful, simple, acceptable, and stable.it was observed that personnel that is dealing with the system have never been given formal trading and no supervision being done, despite this challenge but the participation rate was satisfactory by 75% data completeness by 100%, and timeliness by 100%. Not only that the system collects the sample that is consumed by the community making the system representative.it was also observed that the system lacks a suspected working definition that made it impossible to calculate the sensitivity of the system.
Conclusion: The system performs overall satisfactory producing data on the salt iodization in the country and meets its objective, despite the lack of formal training simplicity of the system makes it possible for the system to continue running, the system data are still vital for the elimination of IDD so, more effort form TFN is needed to ensure the system performs as it was intended.

4. Neglected Tropical Diseases and emerging and re-emerging infectious diseases.

The World Health Organization (WHO) estimated around one billion people living in areas with a greater risk of contracting Neglected Tropical Diseases (NTDs) are a group of 21 diseases caused by viruses, parasites, and bacteria. These diseases are known to debilitate, deform, blind, and kill marginalised communities with poor access to health care and environmental conditions.

Tanzania is endemic for nine NTDs with varying levels of endemicity across the regions. These include Lymphatic Filariasis, Onchocerciasis, Schistosomiasis, Soil Transmitted Helminths, Human African Trypanosomiasis, Trachoma, Leprosy, Dengue fever and Rabies. Although the control strategies for NTDs differ by specific diseases, the main approaches are vector control, sanitation and hygiene and mass drug administration to control transmission and management of complications.

The main focus has been primarily on the preventive chemotherapy of five neglected tropical diseases through Mass Drug Administration (MDA). Concerted efforts by the Ministry of Health has

interrupted the transmission of Lymphatic Filariasis and Trachoma in 95% of endemic district councils. The national neglected tropical diseases control program (NTDCP) is advancing efforts to eradicate transmission of earmarked NTDs as guided by the current WHO road map for NTDs (2021–2030).

Emerging and re-emerging infectious diseases have become a growing concern and increasing threat to global health security. These include dengue, severe acute respiratory syndrome (SARS-COV-1), the Ebola Virus Disease (EVD), cholera, Zika virus, Lassa fever, diphtheria, and yellow fever.

The emergence of these infectious diseases exerts immense pressure on the health systems associated with limited capacity for case detection and management, inadequate capacity in early warning systems and disease surveillance. The session included deliberations on research findings on evidence and answers to existing questions and challenges in the prevention, diagnosis, and management of emerging and re-emerging diseases.

NER1: Impacts of COVID- 19 school closure and other preventive measures in Tanzania: experience from teachers, and students in the Nyarugusu refugees camp

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Background: The Coronavirus Disease-19 (COVID-19) was first reported in Wuhan, China end of December 2019 and in Tanzania was detected on March 15th, 2020, in Arusha region before spreading to other regions in the country. As of May 2020, a total of 509 cases and 21 deaths were reported in the country. Tanzania opted for implementation of non- pharmaceutical preventive measures such as handwashing with clean running water and soap, use of sanitizers, physical distancing and mask wearing. School closure was implemented countrywide including the refugee camps in the first three months. However, its impacts in the refugee camps have not been investigated.
Objective: To investigate the impacts of school closure due to COVID-19 among schoolteachers and students in Nyarugusu refugees' camps, Kigoma region.
Methods: In-depth interviews were conducted to a total of 44 study participants which included teachers and students from Congolese and Burundians schools in the Nyarugusu Refugees camp. The participants were recruited with the support from the camp authority under the educational officer.
Results: The study participants reported A wide range of impacts. Restricted movement that accompanied school closure caused some businesses to close, leading to scarcity of commodities and increased prices. Fear, anxiety, and stress featured as mental health problems, attributable to idleness and uncertainty about the COVID-19. Pregnancies, early marriages, and deviant behaviours among students were reported, contributing to drop-out during school re-opening. Academically, teachers complained of inability to complete the school syllabus as planned. They reported dissatisfaction with school closure as their skills remained dormant for three months and it was even difficult to provide online support to students due to limited internet connectivity and lack of electronic gadgets such as tablets.
Conclusion: The impacts of school closure among teachers and students are devastating. The findings inform the need for designing the coping strategies for future pandemics.

NER2: Emerging epidemics: a study of arboviral vector ecology and health system capacity for surveillance and response in Zanzibar

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Background: Epidemic transmission of arboviral diseases by Aedes mosquitoes present an emerging public health threat in Tanzania. However, reports of arboviral activity have been limited for Zanzibar where, prior to this study, the risk of arboviral epidemics was largely undocumented. Moreover, the capacity of the health system to detect and respond to arboviral epidemics was unknown.
Objective: To determine Aedes mosquito species, abundance, and habitat characteristics to assess the risk of arboviral epidemics and to assess the health system's capacity to timely detect and respond to emerging arboviral epidemics in Zanzibar.
Methods: We conducted cross-sectional entomological surveys in selected urban and rural communities to identify occurrence, abundance, distribution, species composition, and habitat characteristics of Aedes mosquitoes. We applied generalized linear mixed models with binomial and negative binomial distributions to determine predictors of the presence and abundance of immature Ae. aegypti. Furthermore, we used a WHO protocol and generic questionnaire to assess the performance capacity and readiness of the Zanzibar health system for arboviral epidemics. This included structured interviews with health staff, observations, and document review across all 10 districts and 45 randomly selected health facilities. Descriptive analyses were applied for quantitative data, while narrative responses were analysed using thematic analyses.
Results: We documented widespread presence and abundance of Ae. aegypti, in both urban and rural areas. Domestic water storage containers and discarded objects were the main larval habitats, while plastics, metal containers and car tires were the most productive containers. Across all levels of the health system, we observed suboptimal performance on epidemic detection and preparedness, including shortage of trained staff, no diagnostic capacity, inadequate resources for surveillance as well as lack of Aedes surveillance and control interventions.
Conclusion and recommendations: Widespread infestation by Ae. aegypti signify high risk of arboviral epidemics across Zanzibar. Poorly performing disease surveillance and absence of health system readiness hamper detection and control of epidemics. For effective arboviral control, we recommend health system strengthening and integrated multisectoral vector management.

NER3: Sero-survey of the major emerging and re-emerging Aedes-borne in North-Eastern Tanzania

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Background: Diseases caused by Aedes-borne viruses, such as dengue, chikungunya and Zika, are emerging and reemerging in different parts of the world. Tanzania experienced a number of dengue

outbreaks, but prevention, control, and research is challenged with diagnostic capacity, weak surveillance system consequently curbs early detection of the disease.
Objective: To determine the sero-prevalence of dengue and chikungunya in Kwamgwe ward, Tanga.
Methods: The study was conducted in four villages in Kwamgwe ward in the year June 2021. The blood samples were tested for both dengue and chikungunya IgM/IgG antibody using Dengue IgG/IgM Combo Rapid Test and Chikungunya IgM Combo Rapid.
Results: Of the 424 participants, 6.6% (30/422) were positive for Chikungunya IgM, 2.0% (9/424) for dengue IgM and 1.3% (6/424) for dengue IgG. Chikungunya IgM seropositivity was significantly higher ($p < 0.05$) in Ngojoro village (16.7%) as compared to other villages. Headache, abdominal pain, and muscle pain were the most reported symptoms (35.5, 18.7% and 12.1%, respectively).
Conclusion: Chikungunya and dengue virus is circulating yet unrecognized cause of febrile illness. A better understanding of disease dynamics is crucial to assist public health interventions.

NER4: Community Health Workers as community ethnographers in COVID-19 vaccine deployment
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Background: Given the ongoing spread of COVID-19 and relatively low uptake of vaccines in Tanzania, there is an opportunity to develop strategies for gathering community input to inform public health responses to disease outbreaks, and vaccine deployment strategies.
Objectives: To provide evidence about COVID-19 to response teams through integration of social science methods in the community engagement strategy to strengthen preventive and control interventions and vaccine deployment in Tanzania. The objectives are: 1) To document knowledge, beliefs, rumours, and discussions related to COVID-19, prevention and control measures, vaccines, and vaccine deployment 2) To identify information that needs action by the COVID-19 response teams at district and national levels 3) To examine the effectiveness of using community health workers in collecting evidence to inform epidemic response teams
Methodology: This project trained 22 CHWs in Dar es Salaam, Pwani and Kigoma Regions in social science methods and research ethics. The CHWs then documented the challenges, rumours, beliefs, (mis)information, feelings/emotions, and intentions of community members in their jurisdictions during their routine daily work in health promotion for COVID-19 vaccines. We also conducted semi-structured interviews with village, district, regional and national leaders and health officials on their experience working in COVID-19 vaccine deployment.
Results: Analysis using the WHO Determinants of Vaccine Hesitancy Matrix showed that while hesitancy in various Tanzanian communities is linked to broader historical and socio-political narratives (e.g., colonialism, racism, national politics), hesitancy around COVID-19 vaccines is overwhelmingly vaccine-specific and confidence in routine vaccinations appears to remain high. Community members, leaders and CHWs themselves have doubts and questions about vaccine safety and efficacy.
Conclusions and recommendations: There is an opportunity to implement education campaigns around COVID-19 vaccines that are directly responsive to documented doubts and questions to build vaccine confidence in Tanzania.

NER5: The effects of the COVID-19 pandemic on livelihoods and social support mechanisms in Pemba, Unguja and Ilala, Tanzania: a qualitative study

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Background: Coronavirus disease 2019 (COVID-19) has contributed to massive disturbances on people's economic, social, and cultural aspects. Such experiences were brought by the pandemic itself, but also by the policy measures put in place to contain the transmission of the disease.
Objective: To assess the impacts of the COVID-19 pandemic on social and economic lives in Tanzania.
Methods: The cross-sectional study was conducted in Mjini Magharibi, Chake and Ilala districts in the United Republic of Tanzania. The study employed a qualitative design combining focus group discussions, in-depth interviews and semi-structured interviews with community members, leaders, and government officials. Data were analysed using thematic analysis approach.
Results: The main impact of COVID-19 was on businesses and trade, with loss of wage earnings due to a reduction in tourism activities and reduction of essential goods for trade flow from abroad. This, in turn, affected people's purchasing power to fend for themselves, causing food insecurity at the household level. Trade and trading were affected due to the rising prices of essential goods. Restrictions imposed on gatherings created an atmosphere of fear that affected social life and harmed traditional forms of support in times of need. They included participation in religious gatherings, caring for the old and sick, traditional, and religious support during bereavement and burial of suspected COVID-19 deaths. The presentation also discusses how some community members adapted and persevered during the pandemic.
Conclusions: The findings from this study have highlighted the impacts COVID-19 pandemic on social and economic life among Tanzanians as a result of implementation of its control measures. In the future, we recommend support programs to vulnerable households such as food or financial support during outbreaks. The control of essential goods' prices to shield poor households from falling further into poverty should also be considered.

NER6: Comparison of the immune response in peripheral blood and female genital tract mucosa in Wuchereria bancrofti infection and its impact on HIV infection risk

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Background: Previously a population-based cohort study conducted in southwest Tanzania between May 2006 and June 2011 showed more than two-fold increase in the incidence of HIV in Wuchereria Bancrofti (a lymphatic filariasis causing helminth) infected subjects. Our study aims to decipher the causes for the increased HIV susceptibility.
Objective: To determine the effect of W. bancrofti infection on the systemic and cervical mucosa immune response and its association with HIV acquisition.
Methods: Cervical mucosa and peripheral blood samples were collected from HIV negative female participants with (n=20) or without (n=11) lymphatic filariasis from Lindi region, Tanzania. T cell populations were characterized using polychromatic flow cytometry based on their expression of markers for cellular activation (HLA-DR, CD38), γδ2 T-cells, T cell differentiation (CD45RA, CD27), HIV co-receptors (CCR5, α4β7), regulatory T cells (FoxP3, CD25) and transcription markers essential for T cell differentiation (T-bet, Eomes).
Results: Expression of cervical residing γδ2 T cells (median: 4.730 vs 1.290, p value:0.004) was significantly higher in lymphatic filariasis (LF) positive compared to LF negative subjects. In the peripheral blood, increased expression of HIV co-receptor CCR5 (median: 68.80 vs 58.10, p value:0.042) and markedly higher frequencies of the transcription factor T-bet high Eomes dim (median: 18.10 vs 6.29, p value:0.003) on memory (CD45RA-) CD4 T cells of LF positive subjects was observed. Similar frequencies of activated (HLA-DR+ and/or CD38+) CD4 T cells were observed in the blood and mucosa samples of LF+ and LF- women.
Conclusion: Our data demonstrate an association between LF and an increased expression of HIV co-receptor CCR5 on memory CD4 T cells, γδ2+ T cells and transcription factor T-bet which suggests a possible mechanism through which Wuchereria bancrofti infection might be associated with an increased risk of acquiring and disseminating HIV infection.

NER7: CD4 T-helper 1 and T-helper 2 responses to Mycobacterium tuberculosis in HIV and Wuchereria bancrofti infected individuals in Kyela district, Mbeya, Tanzania

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Background: CD4 T-helper 1 and T-helper 2 immune responses to Mycobacterium tuberculosis (MTB) are required to control MTB infection in humans. We, therefore, hypothesized infection with HIV or Wuchereria bancrofti (W.bancrofti) is associated with decreased MTB specific immune responses and reduction in protection against MTB infection and disease progression.

Objective: To determine the CD4 T helper cell responses in individuals who are infected with HIV or W.bancrofti compared to uninfected individuals upon in-vitro stimulation with MTB strain H37Rv whole cell lysate.
Methodology: A total of 122 archived whole blood samples from an on-going study were used to determine the interferon gamma (IFN-γ) Interleukin 2 (IL-2) and Interleukin 4 (IL-4) CD4 T cell responses in samples from HIV-infected (n=20), W.bancrofti infected (n=17), and HIV/W.bancrofti uninfected individuals (n=85) following stimulation with MTB antigen. Flow Cytometry was done to measure the relative amount of cytokines produced after stimulation. Data analysis was done by using Graph Pad Prism.
Results: W. Bancrofti infected individuals had significantly higher frequencies of IFN-γ and IL-2 CD4 T cells responses than uninfected individuals (p =0.014 and p= 0.004). Furthermore, HIV infected individuals had higher frequencies of IFN-γ and IL2 CD4 T cells response than HIV uninfected individuals (p =0.037 and p=0.016). The frequencies of IL-4 CD4 T cells in HIV and W.bancrofti was comparable between infected and uninfected individuals (p =0.447 and p=0.599).
Conclusion and recommendation: Our findings show that cytokine producing MTB-specific CD4 T cells in W.bancrofti and HIV infected individuals are not diminished. It is recommended to conduct further studies with a large sample size to confirm the impact that HIV/W.bancrofti infection has on the host immunity to TB.

NER8: Prevalence of Wuchereria bancrofti microfilariae and its association with HIV infection in people living in Kyela district, Tanzania

Presenting author: Jonathan Lewis Mnkai[1*]
Co-authors: Kenneth Pfarr[2,3], Lucas Maganga[1], Agatha Urio[1], Nhamo Chiwerengo[1], Manuel Ritter[2,3], Achim Hoerauf[2,3], Eric Lelo[4,5], Daniel Kariuki[4], Michael Hoelscher[2,3], Elmar Saathoff[2,3], Mkunde Chachage[1,6], Inge Kroidl[2,3]

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Background: Wuchereria bancrofti alone accounts for 90% of all filariasis cases globally. Our previous study described an increased HIV susceptibility among individuals with circulating filarial antigen (CFA). The current study aims to retrospectively assess the microfilariae (MF) status and decipher if the observed increased HIV susceptibility is also associated with patent or latent of MF in the same cohort.
Methodology: CFA positive HIV negative bio-banked human blood samples (n=377) were analyzed for W. bancrofti MF chitinase by real time PCR.
Results: The overall prevalence of MF was 3.5%. The MF prevalence was significantly higher in female compared to male (5.3% vs 1.6%, p=0.047). Out of 377 total individuals, 22(5.8%) seroconverted to HIV positive within 5 years of follow-up. HIV incidence in W. bancrofti MF chitinase positive individuals was significantly higher than that of MF chitinase negative ones (8.5- vs 1.7- cases per 100 person-years). Prevalence of MF was higher on HIV seroconverters 13.9% (3/22) than on non-seroconverters 2.8%

(10/355), p=0.007. Persons with W. bancrofti MF chitinase positivity were 4 times at risk of acquiring HIV when age and sex adjusted 4.42 (95% CI 1.5 – 13.3, p=0.007).

Conclusion and recommendation: Our data shows an even greater (4-fold) increased risk of acquiring HIV in MF+ individuals than the previously reported risk of acquiring HIV in the general CFA positive cohort. When controlled for commonly known risk factors such as sexual behavior and socioeconomic, patent LF remains a significant risk factor for HIV infection. Thus, anti-filarial treatment can be used as an additional tool for reduction of HIV in lymphatic filariasis endemic areas, should the on-going mass treatment in such areas prove to be futile in reduction of HIV incidences.

NER9: Operational and implementation research on control and elimination of Lymphatic Filariasis in Tanzania: literature review

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Background: Lymphatic filariasis (LF) is a major public health problem in many developing countries and the most prevalent of the neglected tropical diseases. In sub-Saharan Africa, LF is caused by Wuchereria bancrofti and transmitted by mosquitoes. In this region, it has been estimated that more than 45 million people are affected by LF. The disease has considerable mental and socio- economic consequences to the affected individuals and has been ranked as a leading cause of long-term disability in the world. LF is widespread in Tanzania, and it has been estimated that nearly six million people live with debilitating manifestations of the disease.

Objective: We conducted a review of published literature that investigated operational and implementation research on control and elimination of LF in Tanzania.

Methods: Data for the review were identified through PubMed and the extensive files of the authors. A total of 150 relevant published articles were identified and included in the review. Results: The findings showed that studies on LF in Tanzania date back to 1901. Since then, operational and implementation research on LF transmission, control and elimination has been undertaken. Over the past two decades, LF was targeted for global elimination following the launch of the global programme to eliminate LF. As the control interventions intensify, substantial decline in LF transmission indices has been recorded. Programmes monitoring the impact of MDA have documented inadequacies in drug delivery strategies which affects community compliance. Recent reports have shown a shift in LF vectors from transmission by Anopheles in the past to mainly Culex quinquefasciatus.

Conclusion: Despite the progress made in LF control for many years, prevalence of the disease reported in some settings is far beyond the threshold set to define LF elimination. Here we report the evolution of operational and implementation research on control and elimination of LF in Tanzania.

NER10: Filariasis and malignancy: analysis of an association through a narrative review of literature

Presenting author: Valeria Silvestri[1]
Co-authors: Vivian Mushi[1*], Witness Boniventure[1], Mwanahawa Mshana[1], Deodatus Sabas[2], Billy Ngasala[1]
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Background: Lymphatic filariasis is a parasitic infection caused by filarial nematodes (Wuchereria bancrofi, Brugia malayi and Brugia timori), transmitted by mosquito vectors (Anopheles, Aedes, Culex, and Mansonia). Approximately, 120 million people are infected in Africa, South-East Asia, and Americas. Long-term infection can affect the lymphatic system resulting in lymphedema or hydrocele with the majority of cases being asymptomatic. Microfilaria of Wuchereria bancrofi, which is endemic in East Africa, has been detected in cytological smears in unsuspected cases of filariasis; occasionally finding was associated with malignancy.
Objective: To analyze the occurrence of malignancy in patients with filariasis.
Methodology: Narrative review of cases in the literature.
Results: A total of 44 cases (20 female,22 male, 2 unspecified) were included, with a mean age of 44 ± 15.5 years. Filariasis was diagnosed at the time of oncological diagnosis in 81% of cases with 27% of patients being positive for microfilaraemia. Pain and palpable mass were the more frequently reported features (32.7% and 45.6%, respectively). The most frequently reported malignancies were breast (13.6%), lymphangiosarcoma (13.6%), pulmonary adenocarcinoma (11.3%), and pancreatic (6.8%). Treatment by diagnosis and stage, included major limb amputation for lymphangiosarcoma, mastectomy for breast malignancy, and surgical castration for prostatic cancer with testis metastasis. Unresectability of lesion or refusal of surgery were the cause of no treatment. Diethylcarbamazine treatment was proven effective to clear parasites from lesions. Exitus occurred in 4 (28.6%) of the 14 cases, with specified outcomes (lung metastasis in lymphangiosarcoma, non-resectable pancreatic malignancy, or lymphangiosarcoma).
Conclusions and recommendations: Filariasis can be found in association with malignancy. There is still no proof of causality, but in endemic settings screening for helminths in patients with oncological disease should be recommended. Studies are needed to clear the association between non-communicable oncological morbidity and filariasis.

NER11: Step towards elimination of Wuchereria bancrofti in Southwest Tanzania 10 years after Mass Drug Administration with Albendazole and Ivermectin

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Background: Neurocysticercosis (NCC) is a form of Cysticercosis affecting central nervous system. The diversity manifestation of NCC depends on location, size, number of the cysts and the immunity of the host; but is associated with about 30% of acquired epilepsy in highly endemic areas. Limited

knowledge, misconception, and variation of experience could hardly associate NCC with epilepsy in free- range pig-keeping practice communities.
Objective: To assess the Knowledge Perception and Experience of people living with epilepsy attending mental health clinic in selected districts in central and southern Highland of Tanzania.
Methods: Qualitative hospital-based study conducted (September and November 2021) in Kongwa district hospital (Dodoma) and Chunya district hospital (Mbeya). We interviewed 38 participants, 22 were people living with epilepsy (PLWE), 18 years and above, attending mental health clinics and 16 caregivers of PLWE. In-depth interview guide for PLWE and caregivers of PLWE was done in Swahili and local language if needed. Data transcribed using f4transkript V.5.70.2 and themes identification and coding of data to their respective themes was done by the aid of NVivo 12; QSR I.
Results: Overall, 38 participants recruited; 23 from Kongwa; 12 were PLWE i.e., 7 (18.4%) male and 5 (13.2%) female; 11 were caretakers i.e., 9 (23.7%) male 2 (5.3%) female. For Chunya it was 15 participants i.e.,10 PLWE; 5(13.2%) male and 5 (13.2%) female. Caretakes for Chunya were 5 i.e., 2 (5.3%) male and 3 (7.9%) female. Epilepsy was mainly believed to be caused by witchcraft. The community was unaware of NCC as well as its association with epilepsy regardless of all potential environment for endemicity and stigma on epilepsy found in these communities.
Conclusions: Limited knowledge on epilepsy, varying experience, cultural belief on witchcraft and stigma and unaware of association between NCC and epilepsy were the main identified findings in these selected settings.

NER12: Knowledge, perception, and experience of people with epilepsy and their caretakers in selected sites of Tanzania

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Background: Neurocysticercosis (NCC) is a form of Cysticercosis affecting central nervous system. The diversity manifestation of NCC depends on location, size, number of the cysts and the immunity of the host; but is associated with about 30% of acquired epilepsy in highly endemic areas. Limited knowledge, misconception, and variation of experience could hardly associate NCC with epilepsy in free- range pig-keeping practice communities.
Objective: To assess the Knowledge Perception and Experience of people living with epilepsy attending mental health clinic in selected districts in central and southern Highland of Tanzania.
Methods: Qualitative hospital-based study conducted (September and November 2021) in Kongwa district hospital (Dodoma) and Chunya district hospital (Mbeya). We interviewed 38 participants, 22 were people living with epilepsy (PLWE), 18 years and above, attending mental health clinics and 16 caregivers of PLWE. In-depth interview guide for PLWE and caregivers of PLWE was done in Swahili and local language if needed. Data transcribed using f4transkript V.5.70.2 and themes identification and coding of data to their respective themes was done by the aid of NVivo 12; QSR I.
Results: Overall, 38 participants recruited; 23 from Kongwa; 12 were PLWE i.e., 7 (18.4%) male and 5 (13.2%) female; 11 were caretakers i.e., 9 (23.7%) male 2 (5.3%) female. For Chunya it was 15 participants i.e.,10 PLWE; 5(13.2%) male and 5 (13.2%) female. Caretakes for Chunya were 5 i.e., 2 (5.3%) male and 3 (7.9%) female. Epilepsy was mainly believed to be caused by witchcraft. The community was unaware of NCC as well as its association with epilepsy regardless of all potential environment for endemicity and stigma on epilepsy found in these communities.

Conclusions: Limited knowledge on epilepsy, varying experience, cultural belief on witchcraft and stigma and unaware of association between NCC and epilepsy were the main identified findings in these selected settings.

NER13: Construction and assessment of OvMCBL02 chimeric antigen for onchocerciasis diagnosis

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Background: Onchocerciasis is a Neglected Tropical Disease with enormous socioeconomic burden. It is the second leading cause of infectious blindness, with over 99% of 20.9 million cases occurring in Africa. The public health goal of onchocerciasis in Africa has advanced from control to elimination. Numerous reports indicate that accurate diagnosis is necessary to determine treatment endpoints and confirm elimination, as well as to conduct surveillance for the identification of any possible recrudescence of the disease. The current diagnostic tests are either invasive, insensitive, or not applicable in the field and about 25% of onchocerciasis patients are unable to generate immune responses against the Ov-16 antigen used in the only serological test approved by WHO.
Objective: To generate a diagnostic test that will be applicable in onchocerciasis elimination efforts.
Methods: Mass spectrometric analysis of Onchocerca volvulus crude extract was performed to identify proteins that are expressed by the parasite. In silico analysis was done to predict proteins that were specific for O. volvulus. Linear B-epitopes were predicted and used to design OvMCBL02 chimeric antigen. Serological analysis was done to evaluate the diagnostic potential of OvMCBL02 chimeric antigen.
Results: It was revealed that 1393 proteins are expressed in the adult and microfilariae stages of O. volvulus. Computational analysis predicted 6 of the proteins as potential diagnostic targets for the parasite. OvMCBL02 chimeric antigen was designed using linear B-epitopes of these 6 proteins. Serological analysis revealed that OvMCBL02 test significantly differentiated between onchocerciasis patient sera and control sera from Rwanda and Europe. Interestingly, the test did not cross-react with serum samples from patients suffering from related nematode infections.
Conclusion: OvMCBL02 chimeric antigen was constructed and validated as a diagnostic candidate for onchocerciasis. Further characterization of OvMCBL02 chimeric antigen will render it an additional member of the diagnostic toolkit for the elimination of onchocerciasis.

NER14: When and how to stop mass drug administration for elimination of Onchocerciasis: Establishing serologic prevalence threshold

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Background: The current guidelines by World Health Organization recommends that mass drug administration (MDA) for elimination Onchocerciasis should be stopped if demonstrated that Ov-16 ELISA seroprevalence in children below 10 years of age is <0.1%. This prevalence threshold has been confirmed to be conservative to attain through various evaluation studies done in Onchocerciasis endemic countries. Therefore, WHO through its Onchocerciasis Technical Sub-committee (OTS) has realized a need to evaluate a higher seroprevalence of <2% as suggested by Mathematical modelling of onchocerciasis transmission may indicate the elimination of transmission.
Objective: To evaluate whether MDA can be safely stopped at a serologic threshold higher than 0.1% and <2%.
Methods: Serological and Entomological studies have been planned to be conducted in Tukuyu focus in three phases. Comprehensive baseline survey in the phase one of the study was conducted in 2021 while midterm evaluation and final evaluation will be done in 2022 and 2023 respectively to assess whether transmission has been interrupted. Dried blood spots (DBS) were prepared from finger prick capillary blood for Ov-16 ELISA and Ov-16 RDT testing. Adult Blackflies were also collected for PCR testing infectivity rates with Onchocerca volvulus.
Results: Only one (0.04%) out of 2,532 analyzed DBS samples tested positive using Ov-16 RDT. Same DBS samples and Blackflies have not been tested Ov-16 ELISA and PCR for confirmation, respectively.
Conclusion: The preliminary findings have showed that the Onchocerciasis transmission is lower than 2% and demonstrates that probably transmission is nearing interruption and that is safe to stop MDA. Results from Ov-16 ELISA and PCR testing will currently help in decision making whether to stop MDA or otherwise while final evaluation in 2023 will confirm realistic threshold for stopping MDA onchocerciasis MDA in the study area and be used for other areas.

NER15: Community knowledge, attitudes, and practices regarding use of ivermectin in control of onchocerciasis in Mahenge, Tanzania, an area with high epilepsy prevalence

Presenting author: Isolide Massawe[1, *]
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Background: Mahenge area in the Ulanga district in Tanzania is an onchocerciasis endemic focus with high prevalence of epilepsy. Despite of over 20 years of ivermectin distribution for the control of onchocerciasis in Mahenge, transmission remains very high in some areas.
Objective: To assess the knowledge, attitude, and practice towards use of ivermectin in control of onchocerciasis among selected community members in four rural villages in Mahenge.

Methods: This was a community-based study conducted in June - July 2019. Eleven focus group discussions and two In-depth interviews were conducted to participants who were selected using convenient sampling. Participants were community drug distributors (CDDs), people with epilepsy and their caretakers, community resource persons and coordinators from the neglected tropical diseases program. Data was analysed manually using content analysis.
Results: Participants were aware about onchocerciasis where itching, dry/rough skin and leopard skin were mentioned as symptoms of onchocerciasis. On the other hand, participants were unaware of any association between epilepsy and onchocerciasis. Some individuals had never taken ivermectin since the program started, while others took it intermittently. Some of the reasons for missing ivermectin during MDA were refusal due to misconceptions, negligence and not knowing why take ivermectin when not sick. Wrong timing of distribution (coincide with farming), long walking distance by CDDs to reach households, limited supervision and evaluation of the MDA exercise, and short time for distribution of ivermectin were mentioned as program related challenges.
Conclusion: Although the knowledge on onchocerciasis was high, there was limited knowledge on the association between epilepsy and onchocerciasis and importance of use of ivermectin for control of the disease. Continuous advocacy and campaign on the importance of taking ivermectin, and regular supervision during MDA could improve the uptake of ivermectin.

NER16: Ivermectin treatment response in two rural villages with a high prevalence of onchocerciasis and epilepsy, Mahenge Tanzania

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Background: Despite 20 years of ivermectin mass distribution in the Mahenge area, Tanzania, the prevalence of onchocerciasis and epilepsy has remained high in rural villages.
Objectives: We investigated the efficacy of ivermectin in reducing Onchocerca volvulus microfilariae and predictors for parasitic load following ivermectin treatment in persons with (PWE) and without epilepsy (PWOE).
Methods: Between April and September 2019, 50 PWE and 160 randomly selected PWOE from Msogezi and Mdindo villages participated in a follow-up study. Skin snips were obtained pre (baseline) and three months post-ivermectin treatment.
Results: The overall prevalence of O. volvulus positive skin snips at baseline was 49% (103/210), with no significant difference between PWE (58.0%) and PWOE (46.3%); p=0.197. The overall median microfilarial density was significantly higher at baseline (0.0 mf/mg, IQR: 0.0-1.7) than three-month post-ivermectin treatment (0.0 mf/mg, IQR: 0.0-0.0), p<0.001. Three months after ivermectin, the microfilarial density had decreased by ≥80% in 54 (81.8%, 95%CI: 72.3-91.4) of the 66 individuals with positive skin snips at baseline. High microfilarial density at baseline was the only significant predictor associated with higher microfilarial density in the post-ivermectin skin snips.
Conclusion: Our study reports a satisfactory decrease in microfilarial density following ivermectin treatment in most individuals. Optimizing ivermectin coverage will address the ongoing onchocerciasis transmission in Mahenge.

NER17: The Occurrence of schistosoma haematobium and schistosoma bovis hybrid species and their susceptibility to praziquantel treatment in Shinyanga and Misungwi Districts, North-western Tanzania.

Presenting author: Yasinta D. Sylivester[1, *]

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Background: Schistosomiasis is a water-borne parasitic disease with the second-highest socioeconomic impact after Malaria. Preventive chemotherapy using praziquantel is the main intervention in endemic countries including Tanzania. Recently studies in West Africa reported that the occurrence of Schistosoma hybrid species among humans is one of the factors that affect the efficacy of treatment.

Objective: To determine the occurrence of Schistosoma haematobium x Schistosoma bovis hybrids and how they affect treatment outcomes in Shinyanga and Misungwi districts, Northwestern Tanzania.

Methods: A population-based cross-sectional study involving 1,910 participants was conducted. A community-based parasitological survey using urine filtration technique was conducted to determine the prevalence of urinary schistosomiasis. A Rapid Diagnostic Multiplex PCR was carried out to identify schistosome species whether S.bovis or S.haematobium or hybrids of the two species in the studied population. Cure rate and egg reduction rates were accessed at day 21.

Results: The study found that (1) The mean prevalence of schistosomiasis was 6.1% (range 1.31% to 9.33 %). Men were highly infected with urinary Schistosomiasis than women. (2) The frequency of Schistosoma haematobium x Schistosoma bovis hybrids in human population was 3.5% with significant differences among villages (P=0.035). (3) The cure rate of praziquantel treatment was 94.5% and varied significantly with baseline infection intensity (P=0.012), but no significant variation with age, occupation, or sex (P> 0.05).

Conclusion: These findings suggest that schistosomiasis is still a public health problem in the study area. The findings are of public health importance in the "One Health" perspective because livestock may act as the reservoirs of schistosome parasites which in turn act as a barrier towards control and elimination of schistosomiasis in endemic communities. It is recommended that further research should be conducted to assess the long-term effect of schistosome hybrid parasites on praziquantel efficacy.

NER18: Impact of a Test and Treat approach combined with intensive information campaign and community engagement to increase coverage of Mass Drug Administration against schistosomiasis infection for the high-risk adult population in Mwanza region, Tanzania

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Background: Control strategies in Tanzania focus on school children by mass drug administration (MDA) using praziquantel. High risk adults are left untreated although potentially infected.
Objective: To understand the prevalence of *S. mansoni* among the adult population and to find whether Testing and treatment campaign, intensive information campaign and engaging the community improves praziquantel uptake during MDA among high-risk adults in Ilemela and Nyamagana municipality, Mwanza Tanzania.
Methods: For three consecutive years (January 2018, January 2019, and November 2019), we implemented three cross sectional prevalence surveys through a test and treatment approach involving adult individuals aged ≥15 years. Participants' age, sex, and history of participating in the study were recorded by using a questionnaire. A single urine sample were collected from each participant and screened for S. mansoni infection using PO-CCA test. Participants who tested positive were treated with praziquantel 40mg/kg bwt. Prior to the implementation of MDA, there was an intensive information campaign and community engagement. MDA were done among adult individuals about one month after each testing and treating campaign.
Results: A total of 2,148 (38.3% females), 2,070 (32.8% females) and 2,141 (36.6% female) adult individuals participated in the testing and treatment campaign in January 2018, January 2019, and November 2019, respectively. The respective overall prevalence of S.mansoni based on PO-CCA was 81.7% (95%CI: 79.9- 83.2), 70.9% (95%CI: 68.9-72.8) and 74.1% (CI: 72.2 -75.9); indicating a clear decline in prevalence of S. mansoni infection between the baseline and the two consecutive follow-up testing and treatment rounds. The number of participants of PZQ uptake increased from 18,252(67.6%) in the 1st round in February 2018 to 22,581 (83.6%) in July 2019 and 22,583 (83.6%) in December 2019 during the 2ndand 3rd treatment rounds respectively, of the 27,000 adult individuals aimed to be treated in every treatment round. In all three MDA rounds, male had higher participation rate than female and more than half of the participants were youth aged 15-35 years.
Conclusion: There was high prevalence of S. mansoni among adults along shore of the Lake Victoria in Mwanza city, however following testing campaign, engaging the community and intensive information campaign there was a significant increase in praziquantel uptake and improvement in the treatment coverage of MDA. The findings demonstrate the role of multi- strategic approaches on praziquantel uptake when implementing along with treatment and test campaign in high-risk adult population.

NER19: Clinical, serological, and radiological presentations of neurocysticercosis among people with and without HIV in southern highlands of Tanzania

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Background: Neurocysticercosis (NCC) is a form of cysticercosis which affects the central nervous. Human immunodeficiency virus (HIV) may affect the clinical and radiological presentation of NCC in people living with HIV (PLWHIV), but this has not been studied in our society.
Objectives: To describe the clinical, serological, and radiological characteristics of PLWHIV and NCC recruited through HIV clinics compared to non-HIV controls from the community in southern highlands of Tanzania
Methods: Paired cross-sectional study was done (April 2018 to April 2021) whereby PLWHIV from Health facilities were paired with HIV negative individuals from communities of Chunya and Iringa districts. Pairs were matched by sex, age, and distance living within 100M of PLHIV residence. Serological test was done for cysticercosis. If either index or control turned serologically positive for cysticercosis, the pair qualified for detailed clinical neurological assessment and CT scan examination. Data analysis was done by using Stata version 15. A descriptive analysis was performed before building a conditional logistic regression model for prediction of the associations between each potential independent predictor (including HIV) and the dependent variable neuro/cysticercosis. A P-value of < 0.05 was regarded as statistically significant.
Results: Total of 2,564 participants were analyzed; 1,415 (55.2%) being female. Mean (SD) age was 43 (11.4) years. T. Solium cysticercosis serology was done for 2,407 samples and 87 (3.4%) were positive with 52 (4.1%) PLWHIV and 35 (2.7%) without HIV (P<0.04). Of the 164 who went for CT scan; 109 (66.5%) came from Tosamaganga and 106 (64.6%) of all were male); 31 (18.2%) had NCC {17 (54.8%) calcified lesions and 14 (45.2%) active lesions}. Neurocysticercosis manifested with chronic headache and seizures. The number, stage and locations of cysts were not statistically different between HIV negative individuals and PLWHIV.
Conclusions: NCC is more prevalent in PLWHIV, and mixed lesions were more common.

NER20: Serum cytokine profile by multiplex immunoassay in HIV patients with neurocysticercosis: a stage-specific approach to assess the peripheral immune response

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Background: Neurocysticercosis (NCC) and human immunodeficiency virus (HIV) have high disease burden and are prevalent in overlapping low- and middle-income countries. However, little is known

about how these two infections interact, its bearing on disease progression which could impact treatment guidance for people living with HIV/AIDS (PLWH/A) co-infected with NCC.
Objective: To evaluate the peripheral immune response associated with T. solium neurocysticercosis in HIV patients, specifically by determining the host pro- and anti-inflammatory cytokines in neurocysticercosis and determine their possible roles as biomarkers.
Methods: This on-going study recruits adults living in southern highlands of Tanzania, an area endemic for cysticercosis. Serum was obtained from HIV+ patients and their HIV- controls who were matched for gender, age and living area. Their T. solium antibodies (Ab) were measured using LDBio cysticercosis western blot IgG and antigen (Ag) status was determined using ApDia ELISA test which detects circulating antigens from viable metacestode. Neurocysticercosis (NCC) was determined by computed tomography using standard diagnostic criteria and neurological manifestations were confirmed by a standard neurological examination. The cysticercosis positive criteria was defined as: having a positive T. solium result for both antibody and antigen, antigen alone, imaging alone or a combination of suggestive imaging and positive serology. Using multiplex detection technology, sera from participants were assayed for levels of different inflammatory and regulatory cytokines. In addition, demographic, clinical and neuroimaging data were collected and CD4+ cell counts as well as information on highly active antiretroviral treatment (HAART) were noted.
Results: Comparable levels of inflammatory cytokines was observed between HIV+ and HIV- people likely due to 87.7% (1125 out of 1283) being on ART. When we stratified further by T solium infection; levels of inflammatory cytokines (TNF-a, IFN-g, vCAM-1 and IL12) were significantly higher in HIV + positive individuals co infected with T solium cysticercosis compared to those not co-infected with T. solium cysticercosis (p 0.05). Among the HIV+ group, T solium cytokine concentration was not associated with CD4+ cell counts, or duration on ART.
Conclusions: HIV patients co-infected with T. solium cysticercosis have an inflammatory immune response profile which may cause a poor disease prognosis.

NER21: Socio-cultural practices related to taenia solium taeniosis and cysticercosis epidemiology in endemic areas

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Background: Socio-cultural settings and lifestyles of communities in Taenia solium taeniosis/cysticercosis (TSTC) endemic areas significantly influence the epidemiology of diseases. TSTC diseases are of poverty and ignorant related, they cause health, economic and social loses to individuals and community.
Objective: To investigate practices related to socio-cultural influencing the community being at risk of TSTC, in order to equip for digital health education intervention for control.
Methods: A cross-sectional survey focusing on pig-keeping households was carried out in Iringa District Council as a representative of other TSTC endemic areas. The visited households investigated

on pig husbandly, sanitary and hygiene and TSTC diseases precautions they take in relation to socio-cultural aspects. Questionnaire and observation checklists were employed for data collection.
Results: Pit latrines with limited water supply for sanitation and hygiene was common in the surveyed households 87(99%) and most 84(95%) of the latrines were regularly used. The poorly made latrines encouraged open human fecal access in the surrounding. Pigs 294 (85%) were enclosed in poorly made pig pens and 52(15%) pigs were freely roaming. The studied community had poor adherence to routine pig inspection at sales (50% inspection) and less pork inspection at slaughter (50% uninspected). Studied area had no authorized centers for pig slaughter and sales, and the community was not sure with the proper pork preparation for safe consumption. Only health officers in the studied area perceived deep-frying and roasting of pork as inappropriate preparation methods.
Conclusion: The social-cultural practices promote lifestyle of interacting with the Taenia solium life cycle, hence the endemic situation. This community needs sustainable health education to transform the social-cultural practices on the TSTC diseases control. Digital health education seems to encourage for sustainable public health.

NER22: Seroprevalence and risk factors for Taenia solium infection in pigs in Kongwa and Songwe districts, Tanzania
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Background: Porcine cysticercosis (PCC) due to Taenia solium is a zoonotic disease endemic in many low- and middle-income countries (LMICs) with low sanitary conditions and poor pig management practices.
Objective: A cross-sectional study was conducted between June and September 2019 in 42 villages; 28 in Kongwa district in central Tanzania and 14 in Songwe district in southwestern Tanzania to estimate seroprevalence of PCC and its associated risk factors.
Methods The PCC seroprevalence was determined through detecting circulating antigens in pig sera using a commercial Ag-ELISA kit (apDia, Belgium). A structured questionnaire and an observation checklist were used to assess risk factors for disease transmission.
Results: A total of 692 randomly selected pigs (one per household) were sampled (450 from Kongwa district, 242 from Songwe district). The overall sero-prevalence of PCC was 9.7 % (95% CI: 7.6, 12.1). The prevalence in Kongwa was 7.3% (95% CI: 5.1, 10.1) while in Songwe was 14.0% (95% CI: 9.9, 19.1). Village-level prevalence ranged from 0% to 26.7% in Kongwa district and from 5% to 33.3% in Songwe district. About 28% (n=692) of the examined pigs were kept under free range conditions while 8.4% (n= 692) of the surveyed households lacked latrines. Pigs reared in households lacking latrine were more likely of being positive for PCC than those reared in a HH with latrines (OR 2.67; 95% CI: 1.24, 5.72; P= 0. 0.012).
Conclusion: This study has shown that PCC is prevalent and that lack of latrines to be important risk factors that may be addressed in future intervention and educational campaigns for control of T. solium to smallholder pig farmers in Kongwa and Songwe districts.

NER25: Seroprevalence of human taenia solium cysticercosis and associated demographic factors in central and southern, Tanzania

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Background: Taenia solium taeniasis/cysticercosis is a serious public health and economic problem in many low- and middle-income countries. Tanzania is among the sub-Saharan African countries endemic for porcine cysticercosis, which increases the risk of human taeniasis and eventually human cysticercosis. Most studies have been carried out on porcine cysticercosis reporting endemicity in most regions of the country.
Objective: To estimate seroprevalence of human cysticercosis and associated demographic factors in central and southern parts of Tanzania.
Methods: This cross-sectional study included 42 villages (28 from Kongwa, 14 from Songwe) randomly selected with probability proportional to pig population size. Blood samples were collected from 1552 participants (1040 from Kongwa, and 512 from Songwe) one per household and tested for human T. solium cysticercosis using Ag-ELISA and Western blot Ab-assay.
Results: Twenty-nine participants (1.9%) had circulating antigens for T. solium (active cysticercosis) while 32 (2.1%) had antibodies against T. solium cysticercosis (active cysticercosis or only exposure). Males had significantly higher prevalence of T. solium cysticercosis than females based on antigen-ELISA (OR 4.17; 95% CI: 1.25- 13.85), Westernblot IgG assay (OR 4.67; 95% CI: 1.42-15.5) and both tests (OR=8.64, 95%C.I.15-64.86). Participants in the age of 15-25 years had higher prevalence of antigen-ELISA seropositivity than older persons (OR 3.98; 95% C1: 1.51-10.01).
Conclusion and recommendation: Males and youth seem to be more prone to human cysticercosis, most likely because of their increased mobility, which may put them at higher chances of eating outside their homes and possibly in unhygienic situations in these remote settings with limited supply of safe water and sanitary facilities. Appropriate interventions, including health education, should be implemented to control the infection in central and southern highlands of Tanzania.

NER24: The Effect of albendazole intervention on human and porcine cysticercosis among rural communities in Mbulu, Tanzania

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Background: The pork tapeworm is a neglected tropical disease. Countries endemic to neglected tropical diseases have antihelmintic interventions; the effect is not positive for tapeworms. Furthermore; little information on the increased coverage and rounds of antihelmintic regarding the elimination of human and porcine cysticercosis within existing service infrastructure and risk factors.
Objective: We conducted a community intervention using albendazole to target human and porcine cysticercosis in three communities in Mbulu District.
Methodology: A quasi-experimental study was conducted in Mbulu District. We conducted community meetings that involved heads of households prior to albendazole administration with an education package on disease transmission and prevention. The study participants for pre and post were not the

same but from the same communities. The cysticercosis apDia Ag ELISA was used for the determination of human cysticercosis;
pigs were examined by the lingual palpitation method.
Results: A total of 600 participants were recruited; 300 before intervention and 300 after intervention for human cysticercosis. The effect of intervention showed a decrease in human cysticercosis in both arms. For two rounds of albendazole intervention, it decreased by 7.3%. While for one albendazole round decreased by 0.94. The control arm showed a decrease of 9.96%. A total of 510 pigs were conveniently sampled were 267 were sampled during pre-intervention and 243 were sampled during post-intervention. There was a decrease of 14.76% in two rounds of intervention while at one round of intervention there was a decrease by 0.76; the decrease was not significant with reference to the control.
Conclusion: The prevalence of cysticercosis decreased; the decrease is more for communities with high baseline prevalence; there was no significant difference in intervention arms when compared with control. Hygiene and sanitation were experienced in all communities during COVID-19.

NER25: The post-antihelmintic interventional outcome of human and porcine cysticercosis infection in rural setting: a case of Mbulu district in Tanzania
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Background: The human and porcine cysticercosis infection has been observed to be high for years in Mbulu District-Tanzania. A Health education intervention study was conducted in the area targeting the parasite; furthermore, a mass drug administration program is conducted by local authorities using albendazole and praziquantel for intestinal worms for school children. It has been a long time to have information on the current status of prevalence and community risk factors.
Objective: We report on cysticercosis prevalence following ongoing annual antihelmintic intervention in Mbulu rural communities in Tanzania.
Methods: A cross-sectional analytical community-based study was conducted; Human cysticercosis was determined by Ag ELISA. A total of 89 households were visited which resulted in 300 participants being recruited for blood samples; serum was prepared for the Antigen ELISA test using a cysticercosis ApDia test kit. A lingual palpitation method was used to discern the porcine cysticercosis infection status. Observations on household and community risk factors for cysticercosis infection were done.
Results: Human cysticercosis was found to be 23(7.67%) of 300 were positive by cysticercosis apDia Ag ELISA. The infection was low among those who reported that they have taken anthelmintics (Albendazole or praziquantel) though the protection was not statistically significant odds ratio of 00.72(0.26-2.01). A total of 267 pigs were tested of which 128 were tested during the rainy season and 139 during the dry season. Seventeen (13.28%) of 128 were positive during the rainy season and 7(5.03%) of 139 tested positive during the dry season and the results are statistically significant season-wise [odds ratio 2.88 (95% CI of 1.16-7.22)]. The community risks of infections were high.
Conclusion: The cysticercosis targeted community timed intervention using anthelmintics combined with education on disease transmission and prevention during the rainy season.

NER26: Epidemiological, clinical characteristics and treatment response among people living with HIV co-infected with Taenia solium neurocysticercosis from southern highlands, Tanzania

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Background: Neurocysticercosis (NCC) is a form of cysticercosis which affects the central nervous. Human immunodeficiency virus (HIV) may affect the clinical and radiological presentation of NCC in people living with HIV (PLWHIV), but this has not been studied in our society.
Objectives: To describe the clinical, serological, and radiological characteristics of PLWHIV and NCC recruited through HIV clinics compared to non-HIV controls from the community in southern highlands of Tanzania
Methods: Paired cross-sectional study was done (April 2018 to April 2021) whereby PLWHIV from Health facilities were paired with HIV negative individuals from communities of Chunya and Iringa districts. Pairs were matched by sex, age, and distance living within 100M of PLHIV residence. Serological test was done for cysticercosis. If either index or control turned serologically positive for cysticercosis, the pair qualified for detailed clinical neurological assessment and CT scan examination. Data analysis was done by using Stata version 15. A descriptive analysis was performed before building a conditional logistic regression model for prediction of the associations between each potential independent predictor (including HIV) and the dependent variable neuro/cysticercosis. A P-value of < 0.05 was regarded as statistically significant.
Results: Total of 2,564 participants were analyzed; 1,415 (55.2%) being female. Mean (SD) age was 43 (11.4) years. T. Solium cysticercosis serology was done for 2,407 samples and 87 (3.4%) were positive with 52 (4.1%) PLWHIV and 35 (2.7%) without HIV (P<0.04). Of the 164 who went for CT scan; 109 (66.5%) came from Tosamaganga and 106 (64.6%) of all were male); 31 (18.2%) had NCC {17 (54.8%) calcified lesions and 14 (45.2%) active lesions}. Neurocysticercosis manifested with chronic headaches and seizures. The number, stage and locations of cysts were not statistically different between HIV negative individuals and PLWHIV.
Conclusions: NCC is more prevalent in PLWHIV, and mixed lesions were more common.

NER27: Spatial and seasonal determinants of urogenital schistosomiasis snail intermediate host Bulinus nasutus population patterns in an endemic setting

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Background: Transmission of urogenital schistosomiasis in Tanzania is determined by the presence of Bulinus nasutus as a major host for Schistosoma haematobium transmission. However, population

abundance and transmission patterns of B. nasutus tend to vary requiring thorough understanding of the ecological factors determining the fluctuations to interrupt schistosomiasis transmission.
Methods: Snail habitats were identified from interviews with local community leaders and monitored for the duration of 17 months. Snails were collected on monthly basis for 10 minutes per site using handheld scoops. Snail sizes and vegetation cover were observed and recorded. Patent infection of snails was determined. Precipitation estimates were downloaded from climate prediction centre
Results: Out of 6,202 B. nasutus snails collected 184 (2.97%) were found to shed schistosome cercariae. Between snail habitats the prevalence of cercarial shedding ranged from 0% to 14.12%. In a dispersion model a lag of 3-months in rainfall influenced snail population. Snail counts were influenced by presence of vegetation cover. Type of water body influenced dispersion of snails counts, high snail counts were collected from ponds. A lag of 1-month in rainfall had negative impact on snail counts shedding schistosome cercariae. A distribution of snail size from 3 habitats-maintained transmission of schistosomes during dry season. In a negative binomial regression model interaction between snail size and season was not significant.
Conclusion: The study findings indicate that a lag of 3- months in rainfall, type of water body, flow rate and vegetation cover were seasonal determinants of B. nasutus population density. Snail counts collected were potential predictors of snails that were found shedding schistosome cercariae. Considering the trend of B. nasutus population density and temporal variations of snail infectivity control measures should consider specific strategies based on the nature of the transmission habitat to minimize and interrupt transmission patterns of schistosomiasis in endemic areas.

NERP1: The use of mobile phone-based text messages by community health workers in identifying and reporting morbidities due to Lymphatic Filariasis in Kilwa district, Lindi
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Background: Lymphatic filariasis (LF) is one of the neglected tropical diseases, commonly causing swollen limbs (lymphedema) and genitals (hydrocele). Stopping transmission and alleviating suffering are the two pillars of LF elimination via mass drug administration (MDA) and morbidity management and disability prevention services (MMDPS), respectively. Estimating the burden of the LF morbidities and tracking cases for them to access MMDPS is very challenging especially in remote endemic areas.
Objective: To assess whether community health workers (CHWs) are able to effectively identify LF morbidity cases and report them using mobile-based text messages in remote areas.
Methods: This was a community-based cross-sectional study conducted in the Kilwa District in the Lindi region. CHWs were trained in identifying LF morbidity cases, reporting them using mobile phone-based text messaging (MP-BTMS), and providing health education to communities on MMDP services. CHWs examined individuals who consented, for presence of LF morbidities and staged the conditions to determine the severity of lymphedema. CHWs reported LF morbidities data to the central database using MP-BTMS. Clinicians who were blinded to the results by CHWs, re-examined a random sample of 40% of the patients for verification. The confidence interval (CI) was calculated for the kappa statistic of inter-rater agreement.

Results: A total of 1904 LF morbidity cases were identified by CHWs, of which 60% had hydrocele, 36.6% had lymphedema and 3.4% had both. CHWs examined and staged 401 (52.8%) as mild, 335 (44.1%) moderate, and 24(3.2%) as severe cases of lymphedema. Verification by the clinician revealed strong agreement (Kappa-0.97; 95% CI) between CHWs and clinicians in staging lymphedema.
Conclusion: Trained CHWs were effective in identifying cases of LF morbidities, and mobile phone-based text messages have proven to be effective in data capture and reporting. The applicability of the findings should be extended to other endemic areas beyond Kilwa district.

NERP2: The Test-Treat-Track-Test-Treat (5T) strategy for control and elimination of schistosomiasis in two low prevalence villages in North-western Tanzania

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Background: Annual Mass drug administration of praziquantel is effective in reducing transmission and consequently the prevalence of schistosomiasis evidenced by studies done in Kenya and Tanzania. As mass drug administration interventions continue to scale-up in high prevalence areas, more low-prevalence areas are emerging. Mass drug administration becomes a less attractive option in such areas due to cost implications and low treatment compliance.
Objective: To determine the feasibility of a Test-Treat-Track-Test-Treat (5T) strategy in two low schistosomiasis prevalence villages. This strategy has been successfully implemented in diseases such as malaria.
Methods: 100 randomly selected school children aged 6-12 years from each of the two villages were tested for Schistosoma Mansoni using the Point of care Circulating Cathodic Antigen (POC-CCA) test. Positive children referred to as first generation cases (FGC) were followed up and treated including up to 5 members of their families. Second generation cases, identified as close, non-relative contacts of each of the FGC, were also tracked, tested, and treated including up to 5 members of their families.
Results: The prevalence of schistosomiasis was 16.5% in both villages. 24 schistosomiasis cases were included in the study. Prevalence among 94 contacts tracked from FGC was 46.8%. The proportion was higher in females than males, although was not statistically significant ($X2 = 1.8652$, $P = 0.172$). 37.5% of the SGC had schistosomiasis. 47.1% of contacts tracked from SGC had schistosomiasis. Overall, the 5T strategy led to identification and treatment of 97 additional cases out of 222 people tracked at a total time of 52 hours.
Conclusion: Our data demonstrates the potential of the 5T strategy in identifying additional cases of schistosomiasis in low prevalence settings and hence its effectiveness
in accelerating control and elimination of schistosomiasis at relatively low time and resources investment.

5. Health care financing

The World Health Organization describes health financing as a core function of health systems that can enable progress towards universal health coverage. This is through improving effective service coverage and financial protection (WHO; 2022). Health financing describes more than just the money available for health; it includes all of the mechanisms, from raising funds to paying for health services. This provides incentives for providers and users to be efficient. Three key functions of a health financing system are resource mobilization, pooling, and purchasing. They have to ensure people use needed services and are protected from financial catastrophe or impoverishment associated with having to pay for them.

A well-functioning health financing system ensures that people can access the health services they need without suffering financial hardship and that resources are used efficiently and equitably. Notwithstanding that the Government of Tanzania and private sector have played a significant role in financing healthcare at all levels, health financing systems still affect the availability of services especially when there are pocket expenditures. This and other factors call need evidence as we anticipate achieving the universal health coverage and attain the SDG 3 by 2030.

HCF1: Factors influencing health insurance coverage among patients: a case study of Bukoba Regional Referral Hospital.

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Background: Avoidance of catastrophic health expenditures and the need to strive toward universal health coverage have called for the need to develop models of health insurance. Despite the general acceptability that health insurance is a means to the attainment of universal health coverage, health insurance coverage in Tanzania has not met its desired goals with only 9% of the total Tanzanian population enrolled in the National Health Insurance Fund (NHIF) and only 2.1 million households enrolled to Community Health Fund (CHF).
Methods: Descriptive cross-sectional institutional-based study involving 168 participants was conducted. The sample size was 168 participants and data was collected using structured questionnaires and analyzed using SPSS Version 25.
Results: Enrolment in health insurance was 69.0%; Majority (91.38%) belonged to NHIF. 98.2% of the respondents were aware of health insurance. A significant relationship was found between enrolment in health insurance and age (health insurance coverage increases with age, p-value=0.000), level of education attained (health insurance coverage was highest among those who graduated from college/university, p-value=0.017), occupation (health insurance coverage was highest among Government employed and retired persons, p-value=0.000), average monthly income (health insurance coverage increases with increasing income, p-value=0.000), health status (health insurance coverage was highest among persons with chronic illness, p-value=0.000) and awareness on health insurance (p-value=0.009). However, enrolment to health insurance coverage was not significantly associated to gender (p-value=0.637), marital status (p-value=0.151) and religion (p-value=0.741).
Conclusion: The study concluded that enrolment in health insurance was influenced by age, the highest level of education attained, occupation, average monthly income, health status, and awareness of health insurance. This calls for the need of efforts to enable people to be enrolled in CHF

to access referral services easily and improvement on NHIF should be done to integrate individuals working in the informal sector.

HCF2: Willingness and ability to pay for health insurance towards achieving Universal Health Coverage and its associated factors impending the enrolment in Tanzania

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Background: Health insurance schemes have been a preferred strategy to ensure healthy communities towards Universal Health Coverage. However, there are many unanswered questions regarding willingness and ability to pay for health insurance schemes that need to be researched before rolling out UHC in the country.
Objective: To explore the community's willingness and ability to pay for health insurance contribution rates (premiums) and to identify enabler and impending factors.
Methods: A cross-sectional survey using both qualitative and quantitative data collection techniques was conducted in ten regions, representing each zone of Tanzania Mainland, with rural and urban consideration of selected districts. Interviews were conducted with officials in the protection schemes, both beneficiaries (620) and non-beneficiaries (2946); and health services providers (794) from both public and private facilities at different levels of health facilities.
Results: NHIF (8%) and iCHF (5%) are the most common existing health insurance health schemes operating mostly in urban areas (Proportion??) Marketing and enrolment of members to join have been done through community sensitization. Nevertheless, there has been a challenge of clients dropping out which is linked to access to services, medication, low income, and limited understanding of insurance schemes. Only 18.6% of the clients reported having adequate knowledge of the health insurance schemes.
Most of the clients responded to having joined the health insurance when they get enough information about the scheme (54.3%), having large extended families (63.7%), knowing the benefits before (63.6%), and having the services guaranteed during emergencies (76.5%). 73.1% of the respondents expressed a willingness to join health insurance, NHIF (41.1%), and iCHF (39.4%). 24.4-68% of the respondents were willing to pay for various UHC packages (30000-216000), however, 41%-81% articulated the ability to pay for these UHC packages.
Conclusion: Health insurance scheme coverage is still low. Willingness to pay and Ability to pay for UHC package affects majority of community members who are willing to join HIS. For UHC to succeed clients should be ensured of archiving the targeted expectations such as having clear information, affordability, accessibility, and improved services.

HCF3 Assessment of community knowledge and attitude on health insurance schemes: a case study of Musoma municipality in Mara Tanzania

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Background: The health care cost has increased rapidly, resulting into an increase in out-of-pocket payment as well as request for treatment exemption, where the alternative to these are health insurances.
Objective: To assess community knowledge and attitudes towards health insurance schemes in Musoma Municipal Mara Region, Tanzania.
Methods: The study adopted deductive research approach and cross-sectional descriptive research design and data were collected using closed ended structured questionnaires. Data were analysed using descriptive statistics with the SSPSS (ver.21). The sample comprised of 360 households of which the respondents were the heads of households.
Results: The findings of this research indicated that among the heads of households 94.4% were aware of Health Insurance and 74.2% know NHIF and 51.3% of the heads of households were enrolled to different HI schemes. Also, majority of heads of households had knowledge of HI packages, benefits and the least knew HI conditions and regulations. Also, majority of heads of households had positive attitudes towards HI schemes. Poverty and lack of awareness about the HI schemes were the main factors which cause heads of households not to enrol to HI schemes. 185 (51.4%) of the heads of households who were enrolled to HI schemes, 138 (75.6%) were satisfied with services in health sectors. It was concluded that majority of the heads of households had knowledge on HI packages and benefits and the least knew HI conditions and regulations, also more than 50% of the heads of households had positive attitude towards HI schemes. However, poverty was the main factor that hindered enrolment to the schemes.
Conclusion and recommendation: The study recommends that; health education should be conducted in the community about HI. Also, organization such as TASAF should support the households which are impoverished in order for them to afford health insurance costs.

HCF4: Health system costs and feasibility of alternative mechanisms for expanding domestic resources mobilization to finance Malaria, HIV/AIDS, and TB Services in Tanzania

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Background: Donor funding for Malaria, HIV/AIDS and TB has fluctuated drastically in recent years, which might limit the ability of Malaria, HIV/AIDS, and TB programs in the country to achieve universal access and sustain the current progress.
Objective: To assess the health system costs associated with the provision of Malaria, HIV/AIDS and TB services as well as examining the feasibility of alternative mechanisms for expanding domestic resources mobilization to finance Malaria, HIV/AIDS and TB services in the country.
Methods: A cross-sectional study design was employed to collect both quantitative and qualitative data in eight regions; representing each zone of Tanzania mainland with rural and urban considerations. A Micro-costing approach was used to collect cost data from provider perspective for a period of 1 year in 88 public health facilities.
Results: The unit cost of providing Malaria, HIV/AIDS and TB services were estimated to be USD 7, USD 30.42, and USD 45.21, respectively. The total financial gap was estimated to be USD 1.5 billion for HIV, USD 400 million for Malaria and USD 86 million for TB. The projected financial resources needed to support HIV/AIDS, Malaria and TB services for a period of 10 years was estimated to be USD 8.5 billion. Establishment of compulsory Universal Health Insurance, reducing service cost exemption to beneficiaries, imposing taxation in social services, food products, drinks and mobile phone bundles were suggested as the means of expanding domestic resources to mobilize domestic funds to finance HIV/AIDS, Malaria, and TB in the country.
Conclusion: Health system costs associated with the provision of Malaria, HIV/AIDS and TB services are very high. To sustain the current progress, the government should fast track the establishment of alternative financing mechanism to finance HIV, Malaria and TB services other than the fluctuating donor funding.

HCF5: National health insurance coverage for prosthetic and orthotic services in Tanzania
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Background: Despite the growing commitment in developing countries to achieve the "Universal Health Coverage" the situation has not been better among vulnerable physically disabled groups when seeking for their specialized health care. The cost for assistive technologies particularly Prosthetic and Orthotic services remains catastrophic and way beyond the accessibility scope for average Tanzanians with mobility related disabilities. Besides, financial related constraints have been rarely discussed in studies researching for barriers to healthcare faced by people with disabilities.
Objectives: To address the status of National health insurance coverage for Prosthetic and Orthotic services in Tanzania. The paper finally shows how financial related factors are critical barriers to optimal assistive technology in developing countries.
Methods: A cross-sectional descriptive hospital-based study was conducted at Kilimanjaro Christian Medical Centre which serves as a zonal consulting hospital in northern Tanzania. Having met the inclusion criteria a total of 100 participants with mobility related disabilities (as defined by the WHO-ICF classification of 2001) were selected using a non-probability convenient sampling procedure. Pretested semi-structured questionnaires were distributed following attainment of participant's consent/assent then filled and returned thereafter. The Faculty of Rehabilitation Medicine ethical committee of Kilimanjaro Christian Medical University College granted ethical approval. The collected data was cleaned, and descriptive statistics was used to summarize the data in frequencies and percentages.

Results: The uptake of National Health Insurance Fund (NHIF)is still low among people with mobility disabilities as 63% of participants were not even members of NHIF. This is inevitable since only off-shell low profile Orthoses accounting for 3% of the required mobility assistive devices were found to be covered. There was no single custom-made Orthosis nor a Prosthesis that was covered by such a predominant National scheme. Prostheses were clearly mentioned to be excluded in the very first Parliamentary Act back in 1999 when the scheme itself was founded. Having a private sponsor and lack of knowledge were the main factors hindering the uptake of NHIF-Scheme. 49 (49%) participants reported Prosthetic and Orthotic services to be very expensive. A total of 47 (47%) participants depends on private sponsorship. Out of pocket payment system is still significant and was used to fund 36 (36%) prescriptions. 25 (25%) participants holding NHIF cards claimed that the scheme was not helpful at all with regard to Prosthetic and Orthotic services.
Conclusion: The coverage for Prosthetic and Orthotic services in the NHIF-scheme is very close to negligible. The out-of-pocket payment system still exposes people with mobility disabilities to catastrophic expenditures when seeking for assistive devices, which to majority the risk and hence the need is throughout their lifetime. Therefore, it is high time especially in developing countries to recheck and amend the National healthcare policies so as to realize the "universal health coverage" for people with mobility related disabilities.

6. Traditional and alternative medicine

Traditional medicine refers to knowledge, skills, practices applied multiculturally to maintain health and prevent, diagnose, improve, or treat physical and mental illnesses. Such practices are done by using plants, animal and mineral based medicines, spiritual therapies, manual techniques, and exercises, applied singularly or in combination for treatment purposes. The use of traditional medicines has increased across Africa in recent decades reaching 80% usage as first resort for treatment seeking (Gurib-Fakim et. al., 2006; Bodeker and Kronenberg 2002).

Traditional medicine is a key element of today's public health, not only because it offers primary health care to majority in the community but has valuable link with the earth's natural systems, and infinity source of remedies and knowledge. It has expanded use in herbal food supplements, cosmetics, and botanical pesticides to meet human healthcare needs for health-well-being and beauty, economic potential through the sales of products, protection of biodiversity, and the environment through the conservation. Limitations of traditional medicine application include inadequate scientific evidence their safety and efficacy, limited institutionalization and unregulated state of its operations, and poor integration to current governance structures. The World Health Organization (WHO) has in the recent decades, emphasized on the need to formalize, and integrate traditional medicine practices; maximize its contributions to health service delivery, and minimize harm.

Tanzania has addressed this important role through expanding research in TM discovery and development, institutionalization, and integration efforts. Notwithstanding the substantial progress made, the public health potential associated with TM in the country remains largely untapped reservoir of health aids. This session focused on reports of evaluation of various traditional medicines' safety and efficacy.

TRM1: D-optimal mixture design optimized solid formulation containing fruits extracts of Momordica charantia and abelmoschus esculentus

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Background: Fruit extracts of Momordica charantia L. (Cucurbitaceae) and Abelmoschus esculentus (L.) Moench (Malvaceae) have shown promising antidiabetic activities in clinical trials. However, they remain underutilized due to insufficient standardization and formulation.
Objective: To develop and optimize a capsule dosage form containing dried fruit extracts of M. charantia and A. esculentus.
Methods: Response surface methodology (RSM) with a five-level two-factor central composite rotatable design (CCRD) was employed to determine the optimal dose of the mixture. The two extracts were the independent variables while fasting plasma glucose (FPG) was the dependent factor. A D-optimal mixture design was then applied to study the interaction effect of the optimal dose and selected excipients on granules flowability and capsules' disintegration time.
Results: A combined dose of 175 A. esculentus and 281 M. charantia (mg/kg) resulted in a significant reduction of FPG level compared to vehicle at day 14 (mean difference -2.7 ± 0.21, $p < 0.001$) This dose was used to make a 600 mg capsule (DM083) with 76% drug loading. The DM083 had 40.4 mg GAE total polyphenols, 12 peaks HPLC fingerprint, and 27 min disintegration time, and released 81% of total polyphenols during the first 30 minutes in an acidic dissolution media.
Conclusion and recommendations: The D-optimal technique successfully formulated a capsule dosage form containing a mixture of M. charantia and A. esculentus fruit extracts with acceptable standard quality. The biological evaluation of DM083 is an area that requires further research.

TRM2: In vitro activity of plant extract against absidia corymbifera: a case study in Mbeya, Tanzania

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Background: Fungal infections are very common in the world. About 300 million people suffer from serious fungal infection every year, accounting for 1.35 million deaths in immunosuppressed patients. Over 3% of Tanzanians suffer from fungal infections annually. Absidia corymbifera is one of the common fungi found which cause zygomycosis in the form of mycotic and mucormycosis in human.
Objective: To test the in vitro antifungal activity of Solanum carolinense extract against human fungal isolates
Methodology: This was a case study involved three samples collected from patients with suspect of fungal infections. The first sample was collected by scraping the head lesion and the second sample from adult leg, wrapped in a paper envelope, and transported at room temperature. The third sample was a pus from leg wound discharge, collected by swabbing and suspended in 0.85% normal saline, maintained at 2-80c prior processing. Samples were cultured in (SDA) the isolate was confirmed by celotape technique. We adjusted the isolate to McFarland 1.0 with 0.85 % saline and tested with different concentration of Solanum carolinense fruit extract (100 t10-2). Fluconazole was used as a positive control.
Results: At 37°c we observed rapid growing, with colors ranging from white to grayish and woolly texture cotton like structure. The fungal isolate has aseptate hyphae, resembling rhizopus with sporangiophores in spherical sporangia to pyriform in shapes; the characteristics features of Absidia corymbifera. Testing the isolate against the extract; we observed highest antifungal activity with

zones of inhibition of 30mm, 28.5mm and 13.5mm for 100, 10-1 and 10-2 for each extract dilutions. The zone of inhibition for the fluonazole was 23.75mm.
Conclusion and recommendations: Solanum carolinense fruit extract showed promising antifungal activity against the isolated fungi. These finding supports the traditional use of Solanum carolinense plant for treating fungal infection in the communities. Future studies will provide more efficient data on proper use of this promising antifungal plant.

TRM3: Antimycobacterial activity evaluation of an extracts and sterol isolated from Tanzanian edible mushroom afro Cantharellus platyphyllus
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Background: Tuberculosis is a long-time infectious disease caused by Mycobacterium species, particularly Mycobacterium tuberculosis. Its inadequate treatment has led to the emergence of resistant strains. Wild Mushrooms have an extensive history of uses for their medicinal and nutritional properties worldwide. The aim of this study was to determine, isolate and characterize antimycobacterial compounds from ethanolic extract of the fruiting body of a wild edible mushroom species Afrocantharellus platyphyllus.
Methods: Bioactivity-guided isolation of active principle from ethanol extract was performed using column chromatography that was monitored by Thin Layer Chromatography (TLC). The structures of pure isolated compounds were elucidated by Nuclear Magnetic Resonance (NMR) with the help of topspin software. The minimum inhibitory concentration (MIC) of crude extracts, fractions, and pure compounds was determined by a two-fold serial microdilution method.
Results: The 80% ethanolic crude extracts of the fungus were active against three mycobacterial tuberculosis models with MIC of 312, 625, and 1250 µg/ml against M. indicus pranii (MIP), M. madagascariense (MM), and M. aurum (MA), respectively. Bioactivity-guided fractionation of dichloromethane fractions led to the isolation of four active compounds with MIC ranging from 39 to 78 µg/mL against MIP, and 78 to 156 µg/mL against MM. Based on their one-dimensional (1D) and two-dimensional (2D) NMR spectroscopic data the compounds were identified belong to phytosterol namely Engosterol (Ergosta-7,22-dien-3β-ol), Cerevisetrol (Egosta-7,22-diene-3β, 5α, 6β-triol), (22E,24R)-Ergosta- 5α, 6α-epoxy- 8,22-diene-3β, 7α-diol, and D- mannitol. All four compounds are being reported for the first time from A. platyphyllus.
Conclusion: Two compounds; cerevisterol and (22E,24R)-Ergosta- 5α, 6α-epoxy- 8,22-diene-3β, 7α-diol, exhibited moderate antimycobacterial activity that may provide potential scaffolds for drug design against infectious mycobacterial strains.

TRM4: Screening and evaluation of cytotoxicity and antiviral effects of coviba dawa against SARS-CoV-2 Delta

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Background: Bersama abyssinica is a common tree in Africa, with diverse medical uses in different areas. The plant is well-known in Tanzania for treating respiratory disorders such as TB, tonsillitis, bronchitis and asthma, The plant has lately been utilized for treatment of COVID-19 symptoms. Water extract of leaf and stem bark has been registered as a herbal medication known as 'Coviba Dawa' for the treatment of viral and bacterial respiratory infections due to its broad medical benefits. The aim of this work was to test for the cytotoxicity and antiviral effects of bioactive ingredients from B. abyssinica extracts against the Delta variant of the SARS-CoV-2 coronavirus.
Methods: Bersama abyssinica leaves and stem barks were dried under shade in room temperature and then pulverized to obtain small pieces before soaking into different solvents. One hundred grams of each, leaves and stem barks were extracted in petroleum ether, dichloromethane, ethyl acetate and ethanol. Water extract was obtained by decoction of 100g of stem bark into water. Phenols, flavonoids, tannins with antioxidant activity were confirmed as components of the extracts. Analysis of aqueous extracts of bark stem bark and leaves was done by LC-MS/MS (Q-orbitrap-Ultra High Performance Thermofisher Company). Antiviral screening and cytotoxicity experiments were conducted in a Biosafety Level 3 (BSL-3) Laboratory facility according to previously established Standard operating procedures (SOPs).
Results: The existence of four phenolic compounds in B. abyssinica water extract; 2,4-di-tert-butylphenol, 4-formyl-2-methoxyphenyl propionate, 7,8-Dihydroxy-4-methylcoumarin, and 2,3, 6-trimethoxyflavone with antioxidant activity was confirmed by LC-MS/MS analysis. In-vitro testing of the extracts revealed antiviral activity against coronavirus the delta B1 variant of SARS-CoV2.
Conclusions: We recommend further studies to characterize the medicinal value of B. abyssinica metabolites as potential antiviral and antibacterial agents.

TRM5: Formulation and evaluation of herbal cream from methanolic leaf extracts of tephrosia vogelii Hook.f for topical application against skin infections

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Background: A skin infection due to fungal and bacterial infections is among challenges in the health settings. Antimicrobial resistance for the available conventional drugs compels for searching alternative drugs.
Objective: To formulate antimicrobial agent as herbal cream from leaf methanolic extracts of Tephrosia vogelii for topical therapies.
Method: Herbal cream was prepared by homogeneously by mixing up cream base and methanolic leaf extracts of Tephrosia vogelii. Physicochemical properties and in vitro antimicrobial activities of the cream were evaluated. The stability, colour change, washability and texture were parameters used evaluate physicochemical properties of cream. Disc diffusion method was employed to evaluate antimicrobial activities of the cream against Candida albicans (ATCC 90028), Staphylococcus aureus (ATCC25923) and Escherichia coli (ATCC29953).
Results: Formulated herbal creams; CBTV1, CBTV2 and CBTV3 with methanolic extracts concentrations content of Tephrosia vogelii 0.05 %, 0.10 % and 0.25 %, respectively, were prepared. All cream formulations were stable, washable by water, green in colour and soft. The CBTV3 product exhibited prominent antimicrobial activity compared to CBTV1 and CBTV2, henceforth promisingly to be effective for topical skin therapy.
Conclusion: The herbal cream formulation of methanolic leaf extract of Tephrosia vogelii at 0.25% appeared to have more antimicrobial performance. Therefore, it is considered as minimal concentration at which the herbal cream to be formulated for future clinical trials as a potential antifungal agent product for treatment of skin infections.

TRM6: Antitubercular activity of compounds isolated from root extracts of Morella salicifolia and Aphloia theiformis plants used in the management of HIV and AIDS-related conditions
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Background: Tuberculosis is faced by rapid development of resistant strains to the available chemotherapeutic agents and thus pressing the need to search for newer agents. Morella salicifolia and Aphloia theiformis are common plants that is widely used in traditional medicine for managing HIV and AIDS-related conditions including tuberculosis.
Objective: To evaluate antitubercular activity of compounds isolated from Morella salicifolia and Aphloia theiformis roots.
Methods: The roots of M. salicifolia and A. theiformis were collected from Makete district. The materials were extracted using 80% ethanol and fractionated using solvents of varying polarity; dichloromethane, ethyl acetate and ethanol. The broth microdilution assay method was used to assess antimycobacterial activity starting with three non-pathogenic Mycobacterium species including Mycobacterium aurum (MA). Bioassay-guided vacuum liquid chromatography fractionation was applied in isolation of the active compounds which were tested for antitubercular activity using standard M. tuberculosis and clinical isolates.
Results: Fractionation of M. salicifolia root extract led to isolation of six compounds including four pentacyclic triterpenoids; Oleanolic acid (1), maslinic acid (2), taraxerol (3) and myricadiol (4) and two diarylheptanoids; (±)-myricanol (5) and myricanone (6). In A. theiformis two compounds were isolated; Tormentic acid (7) a pentacyclic triterpenoid and procyanidin A2 (8) an epicatechin dimer. Of all compounds from the two plants, seven six had varying activity against the non-pathogenic models.

Compound 2 had MIC of 28 µg/ml and 56 µg/ml against standard M. tuberculosis H37RV and rifampicin resistant M. tuberculosis clinical isolate, respectively.
Conclusion and recommendations: M. salicifolia and A. theiformis contain compounds which can inhibit the growth of Mycobacterium tuberculosis. More studies are needed to assess safety and efficacy of the plant extracts using in-vivo models.

TRM7: In Vivo antifungal activity of sericic acid in immunocompromised mice against candida albicans

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Background: Fungal infections though considered minor have recently turned to be serious infections responsible for the deaths of more than a million people every year especially. Crude extracts from Terminalia species have been exhibiting good antifungal activity which may be attributed to the presence of sericic acid and sericoside compounds, among others. Moreover, in vitro studies of the compound sericic acid have shown positive results during the antifungal activity study. Therefore, the discovery and development of new antifungals is one of the necessary measures to fight these infections.
Objective: To investigate the in vivo antifungal activity of sericic acid in immunocompromised albino mice.
Methods: The mice were immunosuppressed with subcutaneous injection of methylprednisolone acetate (100mg/kg) on days -2, -1,1 and2 of the experiment and were given tetracycline hydrochloride and glucose in their drinking water from day one prior to the experiment. On day 0 all the mice were intramuscularly sedated with 10mg/kg diazepam and then orally infected with a clinical isolate of Candida albicans using a cotton swab. Mice were divided into 4 groups of 4 whereby groups 1 and 2 were treated with 20mg/kg and 10mg/kg of Sericic acid (crystalized compound) group 3 was given 10mg/kg of fluconazole and group four was untreated control. Samples were collected by means of a cotton swab and put into 1ml normal saline. Colony-forming units from each swab were quantified by means of serial dilution.
Results: Compared to the untreated control group Sericic acid at 20mg/kg induced earlier recovery of the mice from oral Candidiasis. It was observed that there was more than 50% earlier recovery when compared to the untreated control group. The positive control group exhibited a significant improvement in the reduction of the fungal load from the beginning of evaluation to the end y. Previous findings have reported that Sericic acid has significant in vitro antifungal activities with (MIC 0.068mg/ml) when it was compared against Clotrimazole (MIC 0.09mg/ml).
Conclusion and recommendations: The results from our study have shown that Sericic acid possesses in vivo antifungal inhibitory activities against Candida albicans. Findings from this study can be used as a pilot basis for the further evaluation of the pharmacokinetics and safety profile of this compound.

TRM8: Ethnobotanical survey of medicinal plants used by traditional healers of South Unguja, Zanzibar

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Background: The rapid increasing of awareness on the use of medicinal plants in today's medical practice has urged the researchers to conduct ethnobotanical investigation so as to reveal the knowledge possessed by the traditional healers on medicinal plants.
Objective: To collect substantial information on application of medicinal plants used by traditional healers of South Region of Unguja, Zanzibar.
Methods: Interviews were held whereby the participants were purposively selected through the help of the local people and village leaders. The interviews were conducted in Swahili language to abridge the communication. A triangulation research methodology was used for qualitative, quantitative, and observational approach whereby structured questioners were used to collect information using kobo system (digitalized system of data collection). A total of 63 Shehias of South Unguja region were visited, and 252 Traditional healers were interviewed to get required information based on ethnomedicinal information, vernacular names, plant parts used, mode of preparations, and ways of remedy administration.
Results: Males traditional healers contributed about 73% of collected information of ethnobotanical use of medicinal plants and only 27% contributed by female respondents. Fifteen (15) diseases treated with different medicinal plants has been reported in this study including blood pressure, respiratory tract infections, vaginal infections, diabetes, malaria, asthma, urinary tract infections, sexual transmitted disease, oral infection, skin disorder, abdominal pain, wound, eye disorder, ulcer, and ear disorder. A total of 78 families were identified from the medicinal plants collected on this study, whereby most of medicinal plants species fall on Euphorbiaceae family (14) followed by Fabaceae (11), Verbenaceae (10), Rutaceae (9), Rubiaceae (7), Anacardiaceae, Annonaceae, Labiatae, Meliaceae, Meliaceae, Moraceae, Sapindaceae (6) and other remaining 63 families were identified. Leaves (44%) and roots (35%) have been observed to be the most plant parts commonly used for medicine by Traditional healers of South Unguja region communities followed by Fruits (8%), Barks (6%), herbs (4%) and flowers, stem, seeds, and buds (1%) were rarely mentioned to be used by Traditional healers.
Conclusion: The basic information of medicinal plants identified by traditional healers of South Unguja will be useful by the Government, stakeholders, and partners to conduct more research regarding the medicinal plants. In addition, the findings of this studies will provide additional understand on the role of traditional healers on managing and treating disease. Therefore, ethnobotanists and pharmacologists will conduct further research regarding pharmacological and phytochemical screening of the claimed medicinal plant species for improving the livelihood of the people and public health in general.

7. Health systems strengthening

According to the World Health Organization, the health system consists of all organizations, people, and actions whose primary intent is to promote, restore or maintain health. This includes efforts to influence determinants of health as well as more direct activities that improve health. A health system is therefore more than the pyramid of publicly owned facilities that deliver personal health services but include the institutions, people and resources involved in delivering health care to individuals.

Contextually, health systems strengthening refers to activities and initiatives that improve the underlying health systems of countries. These manage interactions between them in ways that achieve more equitable and sustainable availability of health services and health outcomes related to diseases that affect the population.

This session included presentations and deliberations on studies that evaluated various health systems interventions throughout the health systems building blocks from health systems inputs, processes, and outputs outcomes.

HSS1: Patient reported experience measures on HIV viral load testing at public health facilities in Dar es Salaam, Tanzania: a convergent mixed method study

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Background: Patients experience measures (PREMs) are recognized as important measure of health care service quality. While viral load testing (VL) is critical to effective treatment of HIV. Little is known about patients' experiences with and barriers to VL testing. We aimed to measure patients' experiences in VL in public sector HIV clinics to inform stakeholders where strategies are needed to improve the quality and rates of VL measurement.
Methods: We conducted a convergent mixed method cross-sectional study among HIV patients. Survey included VL test related PREMs, clinical and sociodemographic factors. PREMs were measured using a 5-point Likert scale. FGDs were conducted to better understand access to VL testing. We used descriptive analysis for patients' factors and PREMs. Univariate and multivariate logistic regression were used to explore association of patient factors, and PREMs with accessing the test and overall VL service satisfaction. Thematic analysis was used for qualitative data.
Results: Of 455 patients invited, 439(96.48%) completed the survey; 331 (75.40%) females, with median age of 41-years. While most people thought that HSR domains were good or very good, many fewer chose the highest rating, with one-third (174 (39.64%)) rated being treated with respect, (173 (39.41)) for being listened to one-quarter (109,24.83%) following advice, (101 (23.01%)) involvement in decisions, and (102(23.23%)) communication. Multivariate analysis, having VL care meeting health goals was significantly associated with following advice, adjusted odds ratio (AOR)=2.12 [95%CI:1.16-3.87], involvement in decisions AOR=4.12 [95%CI 2.25-7.57], and communication AOR=2.32 [95%CI1.28-4.20]. Accessing VL test was significantly associated with secondary school or higher AOR =1.92 [95%CI 1.11-3.34], Not accessing VL test was significantly associated with communications AOR=0.57 [95%CI 0.33-0.98]. FGDs findings reflects the survey data and identified barriers to VL test include lack of autonomy and poor communication.

Conclusion: While some components of HSR were rated high by one-quarter to one-third of patients, room for improvement exists. The association between satisfaction defined as met healthcare needs with components also highlight this important. Barriers identified patients reflected gaps include poor communication and lack of autonomy. Education and staffing the care facilities may help to alleviate the identified gaps to improving the rates and quality of VL test services in Tanzania public health facilities.

HSS2: Unlocking the health system barriers to maximise the uptake and utilisation of molecular diagnostics in low-income and middle-income country setting

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Background: Early access to diagnosis is crucial for effective management of any disease including tuberculosis (TB). We investigated the barriers and opportunities to maximise uptake and utilisation of molecular diagnostics in routine healthcare settings.
Methods: Using the implementation of WHO approved TB diagnostics, Xpert Mycobacterium tuberculosis/rifampicin (MTB/RIF) and Line Probe Assay (LPA) as a benchmark, we evaluated the barriers and how they could be unlocked to maximise uptake and utilisation of molecular diagnostics.
Results: Health officers representing 190 districts/counties participated in the survey across Kenya, Tanzania, and Uganda. The survey findings were corroborated by 145 healthcare facility (HCF) audits and 11 policy-maker engagement workshops. Xpert MTB/RIF coverage was 66%, falling behind microscopy and clinical diagnosis by 33% and 1%, respectively. Stratified by HCF type, Xpert MTB/RIF implementation was 56%, 96% and 95% at district, regional and national referral hospital levels. LPA coverage was 4%, 3% below culture across the three countries. Out of 111 HCFs with Xpert MTB/RIF, 37 (33%) used it to full capacity, performing ≥8 tests per day of which 51% of these were level five (zonal consultant and national referral) HCFs. Likewise, 75% of LPA was available at level five HCFs. Underutilisation of Xpert MTB/RIF and LPA was mainly attributed to inadequate—utilities, 26% and human resource, 22%. Underfinancing was the main reason underlying failure to acquire molecular diagnostics. Second to underfinancing was lack of awareness with 33% healthcare administrators and 49% practitioners were unaware of LPA as TB diagnostic. Creation of a national health tax and decentralising its management was proposed by policymakers as a booster of domestic financing needed to increase access to diagnostics.
Conclusion: Our findings suggest higher uptake and utilisation of molecular diagnostics at tertiary level HCFs contrary to the WHO recommendation. Country-led solutions are crucial for unlocking barriers to increase access to diagnostics.

HSS3: Feasibility and acceptability of a modified shorter all-oral bedaquiline containing MDR/RR-TB regimen in Tanzanian programmatic settings

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Background: Tuberculosis prevails to be the leading cause of deaths from infectious diseases following COVID-19 in 2021. Global MDR/RR-TB cases were estimated at 3.3% and 18% of new and previously treated TB cases in 2019. The 2019 annual National Tuberculosis and Leprosy Programme (NTLP) report estimated an increase in MDR/RR-TB notification from 217 in 2015 to 534 patients in 2019 in Tanzania. The country uses a longer oral MDR/RR-TB regimen of 18 to 20 months as standard of care since November 2019 although the 2018 WHO DR TB guidelines recommended a new shorter all-oral bedaquiline-containing MDR/RR-TB regimen. Given paucity of clinical and programmatic evidence, WHO called upon operational research if pilots of the regimen are to be conducted. In response, NTLP collaborates with the National Institute for Medical Research-Mbeya Centre and Kibong'oto Infectious Diseases Hospital in conducting operational research with acronym "RISE project," in 16 MDR/RR-TB facilities since June 2019 to assess the new regimen's clinical effectiveness and feasibility.
Objective: To describe acceptability, facilitators, and barriers in implementation of a modified shorter all-oral MDR/RR-TB regimen as perceived by healthcare workers and MDR/RR-TB persons.
Methods: A qualitative descriptive study was used that purposively selected 16 MDR/RR-TB persons enrolled in MDR/RR-TB treatment facilities implementing the RISE project and 53 HCWs from respective facilities. A total of 36 IDIs and 8 focus group discussions with 33 HCWs were held at 6 and 15 months timepoints. Data were analyzed by thematic analysis using ATLAS ti.
Results: Four themes emerged namely; preference for shorter MDR/RR TB treatment, inaccessible laboratory tests, persistent infrastructural limitations and enhanced programmatic support.
Conclusion: The shorter all-oral bedaquilline containing regimen is acceptable by MDR/RR TB persons and providers however, financial support for patient access to safety tests and strengthening facility laboratory infrastructure is crucial for the clinical effectiveness of the regimen.

HSS4: Contribution of private health facilities in TB care and treatment: a cross-sectional retrospective study in Tanzania

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Background: Tuberculosis (TB) patients in most of resource-limited countries seek care from public or private health facilities. Documentation of the contribution of private sector in TB services in Tanzania

is limited. Study was conducted to assess the contribution of the private health facilities on TB care and control in Tanzania.
Methods: Retrospective cross-sectional design done in Tanzanian cities (4 out of 6 randomly selected). Twelve facilities (six private and six public) of different levels providing diagnosis and treatment of TB in each city participated. TB patient information abstracted from TB laboratory and Unit registers. Analysis was done using STATA v14.1 statistical package.
Results: Overall, 362 health facilities participated in the study; notification of 11803 (79.1%) patients came from public health facilities; 20% [1,502: 10.1% and 1,623 (10.9%) from Private and FBOs, respectively. TB patients' information abstracted for 14,928; 8,959 (60%) male, and 9,390 (62.9%) aged 15-44 years. HIV results were available for 14,481 (98.7%) and 6,209 (42.3%) were HIV positive. More 383 (25.5%) EPTB diagnosed in private than 318 (19.8%) in FBO and 1,535 (13.1%) public health facilities. Multivariate analysis to assess the association between treatment outcomes and demographic and clinical characteristics showed that TB patients treated in public health facilities were more likely to have unfavourable outcomes than those from private health facilities [CRR; 1.7(1.1-1.2) p<0.005]. PTB negative patients and EPTB were nearly two times more at risk to end up with unfavourable outcome during TB treatment [CRR; 1.4 (1.3-1.6) p<0.001] and [1.5 (5.3-1.7) p<0.001] while TB patients co-infected with HIV were twice at risk to encounter unfavourable outcome [CRR; 1-7 (1.6-1.9) p<0.001].
Conclusion: Public health facilities were main TB service providers in major cities in Tanzania. Participation of non-public health facilities in TB control and care was low. This demonstrated a low coordination of the partnerships under the conventional private-public mix objectives and formal documentation.

HSS5: Establishing institutional factors affecting the availability of essential health commodities in Tanzania with a special focus on the tracer commodities
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Background: Access to and availability of essential health commodities is an important element of health care systems performance. The study aimed to determine institutional factors that affect availability of essential health commodities at all levels of the supply chain.
Methods: A cross sectional study design that employed both qualitative, quantitative questionnaire and desk review methodologies were done in gathering information from facility, district to National level. Districts were selected from 10 regions which constitute MSD zonal warehouses.
Results: Despite Government efforts in health sector, availability of essential health commodities is still constrained by a number of challenges including MSD debt, delayed disbursements of funds by central government, donor dependency for vertical program commodities, and long lead times by MSD suppliers. The downstream side include shortage of human resources and poor inventory management. Moreover, cross cutting challenges include inadequate governance and lack of EMRs and interoperability of information systems.
Conclusion and recommendations: Uninterrupted service delivery depends on the availability of health commodities. The recommendations proposed aim at strengthening upstream and downstream management of essential health commodities to improve access to and availability of the commodities at service delivery points. MoH should develop a medicine policy and supply chain strategy to guide implementation of health commodities related interventions. In addition, the Government should ensure; timely Disbursement of receipt in kind and according to budget with

effective implementation of the Health Commodities Revolving Fund guidelines, Promotion of local pharmaceutical manufacturing industries and employment of pharmaceutical and laboratory personnel. Apart from that, Government should strengthen collaboration with the private sector to complement Government efforts, improve data quality at facilities through strengthening implementation of IMPACT approach and DQAs, Fast track deployment of friendly EMRs in health facilities and Interoperability of electronic information systems for increased and timely visibility of data.

HSS6: Client's perceptions and experiences towards chronic lung diseases intervention: a case study of Chamwino District in Dodoma Tanzania

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Background: Chronic Respiratory Diseases (CRD) are responsible for four million deaths globally; more impact been experienced in low- and middle-income countries. Despite significant morbidity, and mortality, socioeconomic consequences, CRD are underprioritized in public health programs. The International Multidisciplinary Programme to Address Lung Health and TB in Africa(IMPALA) introduced an integrated package of care for CRDs in Sudan and Tanzania to improve management of CRD patients. However, the extent to which such package was received and perceived by patents and care providers is crucial.
Objective: To explore the experiences and perceptions of patients and care providers on the CRD intervention implemented in Chamwino district, Dodoma region, Tanzania.
Methods: A Cross section study was conducted using qualitative methods, in the implementing health facilities at Chamwino District. In-depth interviews were conducted to ten care providers and eight CRD patients to document their experiences on the interventions.
Results: Both Participants reported poor access to CRD services in terms of medicine, equipment and trained human resource. Patients reported neglect after been found TB negative making them end with sufferings. They were experiencing stigma since the coughing was associated with HIV. They reported discrimination by the community members and sometimes not involved in community activities. However, the introduction of CRD intervention, participants declared improved availability of diagnostic tools, essential drugs, and capacity building to care providers. Patients experienced relief and improved wellbeing as some declared to have resumed to their normal activities. Care providers confirmed to have seen a declined trend of recurrent attacks from patients.
Conclusion and recommendations: The findings have revealed positive outcomes resulted from CRD intervention. More efforts are required for sustainability and scalability through improved health systems' functioning.

HSS7: Health research ethics and medicines regulatory capacities: lessons and progress made from an audit of research ethics committees and regulatory pharmacovigilance centers in Tanzania

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Background: Tanzania is among countries that have experienced exponential growth in research activities overtime. An effective research ethics review and medicines regulatory regime is therefore critical for ensuring high quality research, efficient delivery of life saving interventions.
Objective: We conducted a needs assessment audit of research ethics committees (RECs) and pharmacovigilance centres (PCs) to identify areas for capacity development.
Methods: An assessment was conducted among research ethics and pharmacovigilance centres across the country. Parameters including office infrastructure, composition of ethics committees, frequency and quality of committee member training, research protocol review process from submission to approval, quality of research monitoring (clinical trials and quality of reporting adverse drug events (ADEs) of pre- and post- registration medicines) were assessed. Capacity development needs report was submitted to the participating institutions for action.
Results: 12 RECs and 5 PCs were assessed across Tanzania including the National Health Research Ethics Committee (NatHREC) and Tanzania Medicines and Devices Authority (TMDA). Various capacity development needs were identified, and responsible institutions took action. As a result, NatHREC transitioned from hard copy to online protocol submission and review system, which has reduced time-to-protocol-approval from an average of 6 months to 3 months. Several institutional RECs have since upgraded to online review systems. An online ADE reporting system was built to expedite reporting of- and response to- ADEs caused by medicines under clinical trials. Post audit public engagement saw a quadripling of ADE reporting in 2018/19. Online short research ethics course was developed and operationalised to offer training to current and future members of research committees.
Conclusion: These findings demonstrate the value and benefits of baseline needs assessment as an approach to sustainable capacity development.

HSS8: The New paradigm of local research and innovations by local health professionals

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Background: Health research in Tanzania can be traced to colonial time with their interest of fighting endemic and epidemic infections. Post-independence, in 1979, the National Institute for Medical Research was given legal mandate of undertaking, promoting, controlling, and coordinating health research of national interests in Tanzania. The ongoing International and National commitment to

ending COVID-19, pandemics, attaining: Universal Health Converge and Resilient and Sustainable systems for Health by 2030 calls for fundamental reforms and a new Health Research paradigm.
Objective: The paper assesses the response of national health policies and strategies towards strengthening local health research agenda for UHC and RSSH by 2030.
Methods: Review of relevant documents to include National Vision, National Health Policies, Health Sector Strategic Plan; NIMR Health Research Priorities and Plans, Comprehensive Council Health Plans Guidelines Edition 1-IV and other closely related publications. The roles and prospects of local Professionals in Health Research and Innovations for the attainment of UHC and RSSH are reviewed and summarized.
Results: NIMR has been responsible for National Health Research to date except for a short spell of a Health Systems Research Unit [HSRU] in the Ministry of Health [MoH] under NHP of 2003. There has not been a National Health Sector Research agenda [NHRA] under MoH to this date. This situation has undermined relevance, accountability, and effectiveness of research initiative at NIMR, MOH, other involved institutions, District councils and local communities.
Conclusion and recommendations: Lack of NHSRA will hinder timely attainment of UHC and RSSH. It is recommended that the MoH should organize an NHSRA and re-establish HSRU and other necessary research structures at all levels led by Local Health Professionals, the Role of NIMR should be re-defined to effectively support NHSRS. NHRA should be costed and fully supported by MOH and Development Partners.

HSS9: Quality control on isolated and bio-banked peripheral blood mononuclear cells (PBMCs) for successfully immunological and other biomedical research in NIMR-Mbeya Medical Research Center
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Background: Peripheral blood mononuclear cells (PBMCs) are particularly important cells on studying T cell vaccine response as well as T cell immune response against various infections. Therefore, the Isolation, proper banking as well as quality monitoring of cryopreserved PBMCs ensures reliable results in functional and phenotypic assays. This study aims to assess the quality of PBMCs processed and bio banked from different studies at NIMR-Mbeya Medical Research Center.
Objective: To access the quality of Isolated and biobanked PBMCs at Nimr Mbeya Medical research.
Method: The Isolation of PBMCs was done using density gradient medium (ficoll paque or histopaque) and centrifugation methods. Immediately after isolation, PBMCs were transferred to -80˚C overnight and thereafter cryopreserved for prolonged period of time in liquid nitrogen tanks (-120 ˚C to 196 ˚C). The Cryopreserved cells were thawed using house protocol and Annexin V FITC staining procedure was used for checking the viability of the cells. Automated sysmex count and analysis is used for checking the cell recovery rate as well as Interferon gamma ELISPOT assay were used for observing the functionality of these cryopreserved PBMCs. The quality control check is conducted on quarterly basis.
Results: The Viability of cryopreserved cells was above 90% after thawing as well as after resting overnight. The cell recovery rates were above 95% after thawing and also above 75% after resting overnight across all studies. All the PBMCs were able to produce interferon gamma response with CEF and PHA with above 380 SFU/106 cells and 500 SFU/106 cells respectively and the negative control wells with background below 55 SFU/106 cells.

Conclusion: Our results suggest that the PBMC processing unit and Biobanking facility is well performing currently as well as the cold chain is properly maintained during cryopreservation of PBMCs since viability and recovery rate results was above the acceptable ranges as well as the cells analyzed were functional.

HSS10: Contribution of the findings of research from Amani Research Centre to health policies development and practices: a review of documents

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Background: Health research have significant contributions in the implementation of health reforms and clinical practices. However, there is scant evidence on how health research findings have contributed into policy development and reformation.
Objective: To assess the contribution of National Institute for Medical Research (NIMR) - Amani Medical Research Centre (AMRC) research findings into the development, reformation, and practices of health policies.
Methods: This was a desk review study whereby books, electronic peer reviewed articles, research reports, MSc and PhD thesis were employed. The inclusion criteria for documents to be reviewed was having implications on health policies, being conducted at AMRC, or by researchers from AMRC and reported from 1971 to 2021.
Results: About 152 documents were reviewed, only 9.8% had direct policy implication, while 90.2% had general findings. Some of the health policies focusing on clinical research conducted at AMRC, includes: the use of Sulfadoxine Pyrimethamine (SP) instead of Chloroquine, the use of Artemether Lumefantrine (ALU) instead of SP for treating uncomplicated malaria, and the use of injectable Artesunate instead of Quinine for treating severe malaria. On the other hand, some of heath policies from vector control research conducted at AMRC include: the use of convectional insecticide treated nets (ITNs), the use of long-lasting insecticide treated nets (LLINs) instead of ITNs, and the use of insecticides for indoor residual spraying (IRS).
Conclusion and recommendations: The AMRC research findings contributed significantly to the development of health policies in Tanzania and beyond. AMRC is among the first institutions in Africa to show that insecticide treated net prevent malaria and promoted their use. We recommend the government to support dissemination and assimilation of research findings into policy formulation.

HSS11: Perceptions and experiences about the HIV prevention and control act with regards to non-HIV sero-positive status disclosure among people living with HIV in Mwanza, Tanzania

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Background: In Tanzania, the HIV/AIDs control and prevention Act 2008 (Act 28; section IV: 21 page 11) about HIV status disclosure, states that: "Any person who has knowledge of being infected with HIV

after being tested shall; Immediately inform his/her spouse or sexual partner of the fact and take all reasonable measures and precautions to prevent the transmission of HIV to others". Little is known about the perceptions of people on this act in Tanzania

Objective: To describe the perceptions and experiences of people living with HIV about the HIV prevention and control act with regards to HIV seropositive status non-disclosure to the sexual partners in Mwanza, Tanzania

Methods: A descriptive qualitative study was nested in an ongoing cohort study at NIMR- Mwanza, Tanzania. The sub-study involved people living with HIV from the main cohort. Respondents were purposively selected to take part in six focus group discussions and thirty in-depth interviews. Data were transcribed, translated, coded, and analysed by thematic content analysis supported by NVIVO software.

Results: Majorities (> 90%) were not aware and had never heard about the existence of this act or the availability of legal assistance when HIV status non-disclosure to the sexual partner happens. Respondents felt that non-disclosure is a crime similar to killing someone; the partner failing to disclose should be prosecuted. However, in families where these incidences happened, the matter was solved at family level, no legal actions were taken due to fear of stigma and legal procedures.

Conclusion and recommendations: The majority of the respondents interviewed were not aware about the existence of the HIV prevention and control act on HIV status disclosure to sexual partners. More efforts are needed to educate the communities about disclosure being a human right obligation and more programs to overcome HIV related stigma are needed among people living with HIV.

HSS12: Performance evaluation of the highly sensitive histidine-rich protein 2 rapid test for plasmodium falciparum malaria in North-West Tanzania

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Background: Precise detection of Plasmodium infections in community surveys is essential for effective malaria control. Microscopy (the gold standard) and rapid diagnostic tests (RDTs) are the major techniques used to identify malaria infections in the field-based surveys. RDTs are increasingly becoming versatile due to rapid and adequate performance characteristics.

Methods: A malaria prevalence survey was carried out in north-western Tanzania. 397 A malaria prevalence cross-sectional survey was carried out in north-western Tanzania in 2016. A total of 397 individuals aged five years and above were tested for P. falciparum infections. The sensitivity, specificity, positive, and negative predictive values of microscopy, Pf RDT and HSPf RDT was determined using PCR as the gold standard method.

Results: P. falciparum prevalence by microscopy, SD Bioline Pf, HSPf and PCR was 21.9%, 27.7%, 33.3% and 43.2%, respectively. HSPf RDT had significantly higher sensitivity (98.2%) and specificity (91.6%) compared to the routinely used SD Bioline Pf RDT ($P < 0.001$). The positive predictive value (PPV) was 81.8% and the negative predictive value (NPV) was 99.2% for the routinely used SD Bioline Pf RDT. Moreover, HSPf RDT had sensitivity of 69% and specificity of 76.8% compared to microscopy. The PPV was 45.5% and NPV was 89.8% for microscopy. The analytical sensitivity test indicated that the newly developed HSPf RDT had lower detection limits compared to routinely used SD Bioline RDT.

Conclusions and recommendations: HS PfRDT performed better compared to routinely used Pf RDT, and microscopy in detecting malaria infections. The false negativity could be associated with the low

parasite density of the samples. False positivity may be related to the limitations of the expertise of microscopists or persistent antigenicity from previous infections for RDTs. Considering the high sensitivity, specificity, and reliability of HS Pf RDT, it should be integrated into the malaria control program by the MoH.

HSS13: Applying education in practice: the case of pharmaceutical dispensers' training

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Background: The estimated shortage of Human Resources for Health in Tanzania is about 50% and primarily affects the rural population. Shortage of health staff affects quality of health service delivery, the attainment of UHC and health outcomes. Pharmacy staff shortage translates into gaps in pharmaceutical services, causing risks to patients. The pharmacy dispenser course is a 1-year vocational training with 23 weeks for theory and 17 weeks for practical field work.
Objective: To explore the extent of applied learning back on the job and the impact on pharmacy practice.
Methods: A comparative, post intervention assessment measuring indicators of pharmacy practice. 29 public health facilities employing pharmacy- trained dispensers (PTD) were compared with 32 health facilities without pharmacy-trained dispensers (NPTD) in Dodoma, Shinyanga and Morogoro regions. Course assessment results were included. Analysis was done using Microsoft Excel (2016) and SPSS (version 2.5).
Results: Average number of medicines per prescription was 2 and 84% of the prescriptions were filled. Documentation, handling of medicines and dispensing area cleanliness was slightly better for PTD as was medicines availability and stock record keeping. Good dispensing practice was low at 25% and without difference between PTD and NPTD. Dispensing time ranged from 1.8 – 2 minutes. There was no difference of patient knowledge on medicines. There was no difference for labelling and storage practice between the two groups of dispensers.
Conclusion: The study showed no significant difference in performance of pharmacy practice despite a one-year training course which improves knowledge and skills and is highly valued by students, teachers, and supervisors. Practice application not only depends on training but also on the working environment. Job descriptions, tools, SOPs, acceptance by management, recognition by team, adapted work duties, personal attitude, and encouragement to apply learnt skills are prerequisites. Training alone does not lead to better practice.

HSS14: Tracking progress in rational medicine use - an assessment of key indicators between 2012 and 2021 in Dodoma region

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Background: Health care systems cannot operate without medicines. Stock-outs of medicines in Tanzania are common and efforts focus on strengthening supply chain and availability of medicines at point of care. However, appropriate use of medicines will ultimately determine quality of health care. Irrational prescription of medicines is harmful to patients and leads to waste of limited resources.
Objective: This study tracked medicines use over time.

Methods: A cross-sectional baseline study was conducted in 6 districts of Dodoma Region Tanzania in 2012 using WHO methodology. A repeat study in 2021 using the same WHO questionnaires included a random sample of 132 health care facilities. Data collected was analysed using STATA version 13.0.
Results: The number of prescribed medicines per patient encounter slightly increased from 1.9 in 2012 to 2.2 in 2021, while prescription conforming to the National Essential Medicine List (NEDLIT) declined from 98% to 91.2%. Generic prescription decreased from 97% to 63.9%, p-value <0.001. Antibiotic prescription increased from 66.0% to 80.9%, p-value <0.001. Injection use increased from 9.0% to 14.1%, p-value <0.001. Average consultation and dispensing time increased. Correct labelling of prescriptions remained unacceptably low at 2.2%. Patient knowledge about prescribed medicines decreased from 49.0% to 21.3% (p-value<0.001). Availability of reference material increased for STG/NEDLIT. Access time to health care facilities by patients decreased.
Conclusion: The study showed improvement in availability of STG/NEDLIT, better accessibility to health facilities and patient care with longer provider-patient interactions. However, prescribing, and dispensing practice declined significantly for antibiotics and injections, generic prescribing, labelling of medicines and patient information. Findings show a disappointing trend of medicines use. Results should guide specific responsive actions at all levels. Quality of care cannot be improved unless limited resources are used more responsibly.

HSS15: Resilience of health commodity supply during the COVID-19 pandemic: the contribution of the Jazia prime Vendor System

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Background: The COVID-19 pandemic affected health commodities due to disrupted supply chains, increased demand, and price increases. Jazia Prime Vendor System (Jazia PVS) is a Public Private Partnership for procuring health commodities when not available at Medical Stores Department (MSD). The system has been operational since 2018.
Objective: This study highlights the resilience and contribution of Jazia PVS during the pandemic in mitigating health supply challenges including price increases.
Methodology: Routine data from regional monitoring of the Jazia PVS were analyzed between March 2020 and June 2021. Prices of selected health products were compared with baseline prices. Data were collected using monitoring checklists and secondary information from 7 (27%) regions and 5 (37%) contracted regional vendors. Analysis used Microsoft office excel.
Results: Despite the spike in demand, PVS managed to supply commodities to public health facilities, complementing MSD during the pandemic. Facilities recorded availability of medicines of 75% and 85% in April 2020 and April 2021, respectively. Initially, Jazia PVS continued supply of health commodities at original contract prices. As stock depleted and demand increased, vendors and their clients (regions) initiated market price reviews and contract negotiation leading to price adaption. Price increase of 244.83% in June 2020 for examination gloves reduced to 201.72% in June 2021. The baseline price increase for surgical gloves of 122.22% reduced to 77.78%. Paracetamol price increase of 51.72% reduced to 37.93%. The price for azithromycin tablets increased by 69.23% up to June 2021. Multivitamins tablets increased by 157.14%.
Conclusion: The COVID-19 pandemic disrupted health supply chains. The complementary Jazia PVS demonstrated resilience and was able to mitigate supply challenges. Vendors and clients agreed to amend commodities prices as a measure to maintain operations and to sustain supply of health commodities. The system proved flexibility in response to a public health and economic crisis.

HSS16: Assessing public–private procurement practices for medical commodities in Dar es Salaam: a baseline survey

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Background: Medical Stores Department (MSD) is the principal pharmaceutical provider to public health facilities in Tanzania. However, growing demands on MSD from health facilities has proved difficult to satisfy and stock-outs at service delivery points are frequent.
Objective: To assess the procedures and practices of procuring complementary health commodities from private suppliers in Dar es Salaam region when unavailable at MSD.
Methods: The study applied a mixed-method approach. The qualitative part consisted of interviews with suppliers and district authorities and observations of stores in 2018 in the Dar es Salaam region. The quantitative approach included a review and analyses of relevant procurement documents from the 2016/2017 financial year to explore total funds districts used to procure health commodities from the private sector. Ten suppliers were assessed in more detail focusing on cost, quality and availability of medicines, lead times and delivery.
Results: A lack of consistency and written guidelines for procuring medicines from the private sector was observed. The procurement process was bureaucratic and lengthy, driving the councils and healthcare facilities towards alternative ways to procure health commodities when MSD stock-outs occurred. For the 2016/2017 financial year, 17 of 77 prequalified suppliers for the Dar es Salaam region were mandated. 72 completed public health facility orders to private vendors amounted to USD 663,491 with an order fulfilment rate of 100%. The criteria for choosing which supplier to invite to tender was unclear and tenders were given to suppliers that were not prequalified.
Conclusion: Increasing the transparency and efficiency of procurement procedures from the private sector would not only help to better manage MSD stock-outs but also help improve health care services overall, restoring confidence in the Tanzanian health care system and laying a solid foundation for building universal health coverage.

HSS17: Hospital procurement practices of health commodities from private suppliers

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Background: Quality health care delivery depends on availability of safe, effective, and affordable health commodities for achieving Universal Health Coverage. Hospitals procure health commodities from Medical Stores Department (MSD), the national supplier to public health facilities in Tanzania. Health commodities missing at MSD may be procured from prequalified private suppliers.
Objective: To assess hospital procurement practices from private vendors.
Methods: A cross-sectional descriptive study was conducted in tertiary health care hospitals in 2019. It consisted of stakeholder interviews with hospital staff involved in health supply management, document review and observations. A semi- structured questionnaire was used to collect data on procurement practices for health commodities missing at MSD, including current and retrospective documents. Fifteen hospitals were purposively selected in five regions.

Results: 73% or 11/15 of surveyed hospitals had internal tender boards. However, Regional Referral Hospitals used Regional Tender Boards to oversee their procurements. Similarly, 80% of hospitals had existing Medicines and Therapeutic Committees (MTC) that guide selection and use of health commodities. Nevertheless, only 47% of hospitals involved MTCs in procurement of health commodities. The Public Procurement Act requires that public hospitals, as procuring entities, have an annually revised list of prequalified suppliers. However, only about half of the hospitals (53% or 8/15) had an approved list of private suppliers for health commodities not available at MSD. Documents revealed that purchases were also made from non-prequalified suppliers.
Conclusions: There is no uniformity in procurement practices of health commodities from private vendors among surveyed hospitals. Compliance with public procurement procedure regulations varies and is often insufficient. In order to ensure uninterrupted supply of health commodities to hospitals and for realization of value for money, adherence to public procurement regulations is needed to streamline procurement procedures of health commodities from private vendors when stocked-out at MSD.

HSS18: The national adoption of a public-private partnership - the case of Jazia Prime Vendor System
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Background: Jazia Prime Vendor System (Jazia PVS) is a Public Private Partnership (PPP) for procuring health commodities when not available at Medical Stores Department (MSD). The system is operating in Tanzania since 2018. The Government recognizes the role of the private sector in bringing about socio-economic development. PPPs can effectively address constraints of financing, management and maintenance of public goods and services.
Objective: This study highlights the successful adoption of a PPP to bridge the supply gap in health facilities, contributing to improve health care services.
Methods: Regional procurement volumes from contracted private suppliers were compiled from 2015 when covering 3 regions to 2021 covering 26 regions. Data collection used standard monitoring checklists and secondary information from 26 (100%) regions and their respective contracted regional vendors. Analysis was conducted using Microsoft office excel.
Results: Since implementation of PVS, the volume of health supplies procured from private vendors increased from Tsh 1,633,071,570 in 2015 to Tsh 10'206'723'555 in 2021. Procurement was highest in 2019 and decreased in 2020 (pandemic), while increasing again in 2021. Availability of tracer medicines during this time increased from 53% to 92%. Increase of complementary private procurement over the years points to determinants such as external influences of population growth, epidemiological transition, and disrupted supply chains during the pandemic as well as MSD internal challenges of fiscal capitalization and management.
Conclusion: The impressive adoption of the Jazia PVS demonstrates the feasibility and effectiveness of a PPP in health supply chain management. The adoption growth of the PVS procurement volume also points to a need for complementary supply chain models in dynamic health systems. Transparency and efficiency of procurement procedures and contractual adherence from both public and private partners are prerequisites for a successful PPP in the health sector, promoting confidence in the Tanzanian health care system.

HSS19: Integrated accountability mechanisms contributing to the success of the prime vendor system

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Background: Access to safe, effective, quality, and affordable essential medicines is a central component for achieving Universal Health Coverage (UHC), however availability is often limited. To complement Medical Stores Department, Tanzania has implemented a complementary pharmaceutical supply channel, the Jazia Prime Vendor System (Jazia PVS), a public-private partnership based on a regional single vendor approach.
Objective: To analyse how accountability contributes to performance of Jazia PVS in Tanzania.
Methods: The study was conducted in four districts of Dodoma and Morogoro region and included 27 purposively selected health facilities. We conducted thirty in-depth interviews (IDIs), seven group discussions (GD) and fourteen focus group discussions (FGDs) in 2018. A deductive and inductive approach was used to develop themes and framework analysis to summarize the data. The approach allowed for an in-depth, multi-faceted exploration of complex issues in real-life settings. The focus was on financial, performance and procedure accountability.
Results: Study findings revealed a number of integrated accountability mechanisms contributing to the success of the system. They included inventory and financial auditing conducted by district pharmacists and internal auditors, financial reporting mechanisms on revenue and expenditure, contractual performance targets, close monitoring of standard operating procedures by the prime vendor regional coordinating office and district-based peer cascade coaching. Direct health facility financing positively influenced financial accountability. Auditing identified challenges such as delayed payment to the prime vendor while coaching was crucial to improve skills at facilities to manage the supply chain.
Conclusions: Financial, performance and procedure accountability measures play a significant role for the successful performance of Jazia PVS. Study findings highlight the need for capacity building linked to financial and medicine management at lower-level health facilities as stipulated in the standard operating procedures, including health facility governing committees, which are responsible for priority settings and decision-making on fund usage at the facility.

HSS20: An integrated hospital-district performance evaluation system: evidence from a pilot study in Ethiopia, Tanzania, and Uganda

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Background: The last two decades saw an extensive effort to design, develop and implement Performance Evaluation Systems (PESs) in High Income Countries (HICs). However, the literature reports only few experiences regarding the design integrated PESs specifically applied to low-and

middle – income countries (LMICs). When available, they refer to specific services or geographical settings, and they do not compare performance from a multidimensional perspective.
Objective: To describe the development, implementation, and use of a specific integrated and bottom-up PES aimed at measuring and evaluating healthcare services provision at local level.
Methods: We adapted and tailored the framework currently adopted to evaluate Italian regional healthcare systems and some OECD countries through an iterative multi-stakeholder's process. The analysis involved four hospitals and their relative health districts in Ethiopia, Tanzania, and Uganda. The evaluation process was undertaken for those indicators considered feasible to be evaluated using the same reference standard. The evaluation scores were determined by either using international standards identified in the literature when available or using the benchmarking assessment of values statistical distribution.
Results: We defined 128 indicators over eight different dimensions and 24 areas. 80 indicators were calculated at hospital level and 48 at district level. Additionally, the evaluation process was performed for 48 indicators. Evaluated indicators were summarized using specific and innovative graphical tools, namely dartboards, staves, and performance maps.
Conclusion: The system presented in this study represents a useful framework to be shared with actors and professionals involved in the design, implementation, and use of PESs in LMICs. In settings characterised by multiple healthcare service providers, this framework may contribute to achieve good governance trough performance evaluation, benchmarking, and accountability. It may promote evidence-based decision making in the planning and allocation of resources, thus ultimately fostering quality improvement processes and practices both at hospital and health district level.

HSS21: Strengthening disease surveillance systems in Tanzania: an intervention to improve data informed decision making at district level
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Background: An effective disease surveillance system is critical for early detection and response to disease epidemics.
Objective: To assess the capacity to manage and utilize disease surveillance data and implement an intervention to improve data analysis and use at the district level in Tanzania.
Methods: Mapping, in-depth interview and desk review were employed for data collection in Ilala and Kinondoni districts in Tanzania. Interviews were conducted with members of the council health management teams (CHMT) to assess attitudes, motivation and practices related to surveillance data analysis and use. Based on identified gaps, an intervention package was developed on basic data analysis, interpretation, and use. The effectiveness of the intervention package was assessed using pre-and post-intervention tests.

Results: The individual interviews involved 21 CHMT members (females=10; males=11) with an overall median age of 44.5 years (IQR=37, 53). Over half of the participants regarded their data analytical capacities and skills as excellent. Analytical capacity was higher in Kinondoni (61%) than Ilala (52%). Agreement on the availability of the opportunities to enhance capacity and skills was reported by 68% and 91% of the participants from Ilala and Kinondoni, respectively. Reported challenges in disease surveillance included data incompleteness and difficulties in data storage and accessibility. Training related to enhancement of data management was reported to be infrequently done. In terms of data interpretation and use, despite reporting of incidence of viral haemorrhagic fevers for five years, no actions were taken to either investigate or mitigate, indicating poor use of surveillance data in monitoring disease occurrence. The overall percentage increase on surveillance knowledge between pre-and post-training was 37.6% for Ilala and 20.4% for Kinondoni indicating a positive impact on of the training.
Conclusion: Most of the district health officials had limited skills and practices on data analysis, interpretation, and use. The training in data analysis and interpretation significantly improved skills of the participants.

HSS22: Twenty years of integrated disease surveillance and response in Sub-Saharan Africa: challenges and opportunities for effective management of infectious disease epidemics
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Background: This systematic review aimed to analyse the performance of the Integrated Disease Surveillance and Response (IDSR) strategy in Sub-Saharan Africa (SSA) and how its implementation has embraced advancement in information technology, big data analytics techniques and wealth of data sources.
Methods: HINARI, PubMed, and advanced Google Scholar databases were searched for eligible articles. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols.
Results: A total of 1,809 articles were identified and screened at two stages. Forty-five studies met the inclusion criteria, of which 35 were country-specific, seven covered the SSA region, and three covered 3-4 countries. Twenty-six studies assessed the IDSR core functions, 43 the support functions, while 24 addressed both functions. Most of the studies involved Tanzania (9), Ghana (6) and Uganda (5). The routine Health Management Information System (HMIS), which collects data from health care facilities, has remained the primary source of IDSR data. However, the system is characterised by inadequate data completeness, timeliness, quality, analysis and utilisation, and lack of integration of data from other sources. Under-use of advanced and big data analytical technologies in performing disease surveillance and relating multiple indicators minimises the optimisation of clinical and practice evidence-based decision-making.

Conclusions: This review indicates that most countries in SSA rely mainly on traditional indicator-based disease surveillance utilising data from healthcare facilities with limited use of data from other sources. It is high time that SSA countries consider and adopt multi-sectoral, multi-disease and multi-indicator platforms that integrate other sources of health information to provide support to effective detection and prompt response to public health threats.

HSS23: Challenges regarding leadership in decision making in the provision of health services: case of Mbarali district, Tanzania

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Background: Effective leadership is essential in making fair decisions in the provision of health services thus measuring efficient use of scarce resources. Decision making processes are context specific and health managers encounter many challenges in making fair decisions. The objective of this study was to explore the role of leadership and identify challenges encountered in making fair decisions in the health sector at the district level scientific evaluation of the Accountability for Reasonableness (A4R) framework.
Methods: We used exploratory qualitative data collection techniques to purposefully sample key informants from Mbarali district in Tanzania. In-depth interviews were then conducted to respondents which included officials from health department and those outside the health sector. Data on general leadership were included that went beyond the concrete leadership for the application of the A4R framework to priority setting decisions only, but also explored general views on leadership and decision making.
Results: Inadequate accountability of leaders on use of funds was identified as a key finding resulting in planned activities not being implemented satisfactorily. Lack of effective monitoring on use of funds from regional and national levels was a challenge. There was limited local accountability due to a number of factors leading to making decisions without consultation, interference by politicians, or by not deciding at all, but leaving or deputizing decisions to lower cadres without retaining oversight or responsibility. It appeared that local stakeholders and users lacked courage to question actions of their leaders.
Discussion and conclusions: Improvement in leadership requires effective support and monitoring from regional and national levels as well as an increase in both national and local demand for accountability. Effective leadership in low-income country setting faces many challenges and addressing such challenges demand both internal and external district interventions.

HSS24: Factors influencing timeliness of ethical review in Tanzania: assessment of proposal review systems

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Background: Ethical review is an essential and mandatory procedure for scientifically sound health research. The review process has specified timeframes with respect to RECs-SOPs. There has been an ongoing outcry from researchers on the lengthiness of turnaround time of proposal approvals.
Objective: To assess the timeliness of proposal review for two review systems and factors that influenced timeliness.
Methods: This was a cross-sectional quantitative study with retrospective data collection of a sample of 200 research proposals submitted during a 2-year period for two review systems where one was a Precursor Proposal Review system (PPRS) and another an Improved Proposal Review system (IPRS).
Results: IPRS had a mean total review and approval time of 37 days which was 33 days shorter than the mean total review and approval time of PPRS, 70 days. Factors found to have a statistically significant influence on the total review and approval time were; review system used, type of study, turnaround time of resubmissions, number of resubmissions made and reviewers' comments.
Conclusion and recommendations: Researchers should make their resubmissions on time to shorten the review time. Compliance to reviewers' comments will reduce number of resubmissions made by researchers and consequently also the review time. The REC is advised to find ways to shorten review time for clinical trials without compromising the safety of participants and integrity of research.

HSS25: Birth defect surveillance system evaluation
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Background: Birth defects refer to a group of diseases originating during embryogenesis resulting in structural or functional abnormalities which are present from birth. Globally, every year 6% of children are born with serious congenital birth defects and 3.3 million deaths occur due to birth defects.
Objectives: To evaluate the performance of the established birth defect surveillance system in Kahama Town Council from January 2020 to December 2021.
Methods: This evaluation was conducted at four levels (Ministry of Health, Regional, District and health facility). Birth defect data for a period of two years were reviewed from January 2020 to December 2021. Two staff from each level were purposively selected for an interview due to their role in data collection and report preparation. Data was obtained through record review, observation, reports, and semi-structured interviews using a simple questionnaire. Analysis was done using Microsoft excel and results were presented in charts, graphs, and tables.
Results: It was observed that for the past two years a total of 63 birth defects cases were reported with an estimated prevalence of 0.2%. The majority of the cases were oral-facial clefts 23 (36.5%) followed by talipes equinovarus 17 (26.9%). The birth defect surveillance system was found to be useful, representative, flexible, acceptable, simple, and sensitive enough to detect cases. However, stability was lacking, and a positive predictive value could not be obtained.
Conclusion: The system performance was found to be satisfactory for the period evaluated. Objectives of the system are met as we were able to estimate the prevalence of birth defects, provide descriptive epidemiology of selected external birth defects and sensitized the use of Folic Acid among pregnant women. Although the system was found to be unstable, no funds were allocated for the operations of the system to ensure sustainability.

HSS26: Barriers and facilitators to use of hydroxyurea among children with sickle cell disease: experiences of stakeholders in Tanzania

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Background: Factors contributing to low use of hydroxyurea (HU) among sickle cell disease (SCD) patients exist in high-income countries. The latter leaves a drift of literature on factors for low utilization of HU in developing countries.
Objectives: To explore the factors influencing the use of HU in the management of SCD in Tanzania.
Methods: A qualitative study was employed to interview purposively selected participants for this study. The in-depth interviews were conducted with 11 parents of children with SCD, four medical doctors working at sickle cell clinics, and two representatives of the national health insurance fund (NHIF). Interviews were audio-recorded, transcribed, and thematically analysed.
Results: Barriers identified were misconception of parents on SCD, financial constraints, regulatory restrictions, worries and fears of medical doctors on the acceptability of HU, shortages of laboratory equipment and consumables, and limited availability of HU. Adequate knowledge of the parents and medical doctors on SCD and HU and opportunities for HU accessibility were the facilitators identified.
Conclusion: The utilization of HU by the individual with SCD is affected by several factors, from individual to policy level. Nevertheless, parents of children with SCD and medical doctors working in sickle cell clinics demonstrated good knowledge of the diseases and HU.

HSS27: Socio-ecological systems analysis of the risk management of anthrax in Longido District, northern Tanzania

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Background: Anthrax is an important zoonotic disease in Tanzania. The objective of this study was to carry out a socio-ecological systems (SES) analysis on anthrax outbreaks in humans and identify risk factors and readiness of the health system in its prevention and control.
Methods: This cross-sectional study was carried out in Longido District of northern Tanzania during September-October 2021. Documentary review and participatory rapid appraisal methods were used

to explore socio-ecological factors and practices related to prevention and control of anthrax outbreaks. A SES framework analysis was employed to identify drivers of anthrax and responses by the district to contain it. The districts' readiness in the response to anthrax was assessed using a semi-structured questionnaire.
Results: The district was characterized mainly by a rural ecosystem, with the majority of the people practicing traditional pastoralism. Generally, women and children were the most affected groups, which was attributed to gendered division of labour. Risk factors influencing anthrax outbreak included people's habits of butchering and consuming meat from sick and dead animals; people's frequent interactions with wild animals; and livestock keepers' tendency of processing skin and hides from a dead animal. The district lacked reliable transport, adequate human and financial resources and anthrax contingency plan. There was no capacity for anthrax confirmatory diagnosis at the primary health care facilities. There were no routine community education and awareness programme about the disease.
Conclusion: The factors influencing anthrax outbreaks in the district include being in close proximity to the wildlife area, sharing of pasture between wild and domestic animals and the habits of butchering and consumption of meat from sick animals. There was inadequate capacity in the surveillance, diagnosis, prevention, and control of anthrax, which underscores the need to improve these critical areas.

HSS28: Assessing interoperability of routine health information systems in Tanzania
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Background: Quality and easily accessible health information increases health system performance and timely response to the health needs. Attempts are in place to improve integration gateways which will save to ensure interoperability among health information systems.
Objective: To assess the impending and enabling factors of interoperability of Routine Health Information Systems with DHIS2 in Tanzania.
Methods: Descriptive Cross-sectional using quantitative and qualitative methods was done in 8 regions from January to April 2022. Quantitative data included 94 Facility data focal persons and 331 Health Information System (HIS) users across different levels of healthcare sector and qualitative data included 31 key informant interviews with HISs stakeholders.
Results: A total of 63 (HISs) were identified and the commonest used were GoTHOMIS (55.9%), CTC2 (53.8%), eLMIS (40.9%), NHIF Portal (28%) and DHIS2 (21.5%). Most of existing HIS are non-interoperable. Only (13.8%) of respondents reported the particular HISs can send data to DHIS2, request GePG (18.0%), can be used to procure drugs and supplies from MSD (11.9%) and can show NHIF information (26.4%).
Limitations of interoperability of existing HISs with DHIS2 among users were high cost of interoperability (52.3%), lack of patient identification in the exchange of health information (19.6%) and limited funding mechanisms (27.8%). Moreover, qualitative results showed that limited access to system source codes, poor internet accessibility, absence of data rooms, availability of IT experts only

at district levels, and lack of trainings in HIS emerged as challenges to access HISs. Over 90% of users strongly agreed that interoperability will increase quality service and access to correct statistics at the National level and facilitate evidence-based planning and decision making. **Conclusion:** Majority of HISs are not interoperable and are owned by the government. More investments are needed to overcome the barriers for interoperability and produce 'best-fit' HISs based on stakeholders' information interests.

HSSP1: A qualitative study on health facility utilization of GeneXpert machines for TB diagnosis in Tanzania

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Background: Tanzania with approximately 295 TB cases per 100,000 populations is among the 30 WHO identified high TB burden countries in the world. According to TB program review report of 2020, there was a decline of bacteriologically confirmed cases between 2015 and 2019 from 42% to 35% despite a significant country level investment in GeneXpert MTB/RIF machines from to 95 to 238 in 2019.
Objective: To assess factors influencing utilization of the distributed GeneXpert machines in diagnostic centers.
Methods: A qualitative descriptive study using structured interviews was conducted between November and December 2020. Fourteen health facilities in six regions were purposively selected while clinicians and laboratory technicians were recruited conveniently from TB clinics of respective facilities. Qualitative content analysis was adopted using ATLAS ti.
Results: Placement of GeneXpert machines in laboratories was reported by majority of participants to allow for dual testing of TB, point of care early infant diagnosis for HIV and HIV viral load monitoring. Experiences of power cuts with unreliable back-up power supply, cartridges stockouts and module breakdowns were reported by all clinicians to encompass challenges encountered by facilities. Complaints relating to delays in fixing modules and receipt of ordered cartridges were additional challenges reported by all laboratory technicians. These were translated to delays in initiation of TB treatment and pre-treatment loss to follow-up. Timely ordering and keeping inventory of stocks, ensuring constant supply of diagnostic tools as well as personal ownership of TB department were perceived as solutions in addressing challenges described.
Conclusion: GeneXpert was perceived as beneficial however, facility challenges constitute underlying reasons for sub-optimal use for TB diagnosis. These may translate to low notification of bacteriologically confirmed cases. Strengthening of facility laboratory infrastructure and addressing health system bottlenecks are among strategies to improve conditions necessary for GeneXpert testing.

HSSP3: A clinical trial of oral N-acetylcysteine to replenish glutathione in Tuberculosis

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Background: Sustained MTB infection leads to ROS production that can damage cells and lung tissues. Glutathione (GSH), a sulfur-containing tripeptide, helps to neutralize ROS: 2GSH+O-⟶GSSG+H2O. The process consumes GSH, which becomes depleted in TB. NAC is a temperature-stable form of cysteine, required to replenish GSH. NAC 1200mg BID exceeds ordinary dietary intake by 5-fold. We hypothesized that NAC will help restore GSH in TB and by doing so, will prevent permanent lung injury and promote recovery of lung function. This report describes the effects on GSH.
Methods: Subjects: Inclusion: First episodes of pulmonary TB, sputum Xpert showing RIF-S and Ct≤27, CXR showing moderate or far-advanced disease, lab safety parameters within specified limits, and, if HIV+, ≥100 CD4+ T cells/uL
Treatments: NAC 1200mg BID for days 1-112 plus HRZE, or HRZE alone. HIV+ participants not already on ART started on ART during study participation
Measurements: Whole blood was obtained for measurement of oxidized (GSSG) and total glutathione (GSH+GSSG) on days 1, 7, 14, 28, 56, 112, and 168. Reduced GSH was calculated as the difference between oxidized and total.
Results: GSH was low at baseline 217±148 uM and did not differ between arms. GSH remained low in controls, increasing by 127 µM by day 168. Levels increased in NAC recipients compared to controls, by day 7 for total GSH, and by day 56 for free GSH. GSH continued to increase throughout NAC treatment and declined on its cessation.
Conclusion: GSH levels are low in TB. Oral NAC supplementation can help restore GSH in patients starting TB treatment. The finding that total glutathione increased quickly whereas free GSH increased only after 2 months indicates a rapid initial flux of cysteine→GSH→GSSG due to intense oxidative stress. The decline in GSH after stopping NAC may indicate sustained inflammation and oxidative stress despite apparently successful TB treatment.

HSSP4: Evaluation of the yellow fever surveillance system at Julius Nyerere International Airport, Dar es Salaam, Tanzania-April 2021 to January 2022

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Background: Yellow fever is common in tropical and subtropical areas of South America and Africa. Worldwide, about 600 million people live in endemic areas. The WHO estimates 200 000 cases of yellow fever worldwide each year. The yellow fever surveillance system is the designated system for early detection, preparedness, and notification of suspected travellers or a case. It was established in 1954.
Objectives: To determine whether the yellow fever surveillance system meets its objectives and to evaluate its attributes.
Methodology: The study was conducted in March 2022 at Julius Nyerere International Airport. The CDC updated Guideline for Evaluating Public Health Surveillance System was used to evaluate the

performance of the system using data from April 2021 to January 2022. Data was collected using an interview administered questionnaire, document review, and observation.
Results: 17/22 staff completed the questionnaire. Of these 14(82.4%) were Environmental Health Officers and 4(23.5%) were laboratory technicians. From April 2021 to January 2022, 550,156 travellers were screened and verified yellow fever vaccination cards, 661 of these received vaccines at the airport arriving from yellow fever endemic countries. The overall performance for yellow fever surveillance was good. Key strengths of the system attributes were the simplicity (80%), its data quality (90%), its acceptability (70%), its timeliness (100%) and its flexibility (81.5%), while stability (43%) was not good due to insufficiency of training to port health officers on yellow fever surveillance. Sensitivity and Positive Predictive Value could not be evaluated.
Conclusions: The yellow fever surveillance system is simple, acceptable, flexible, and sustainable at the airport. The system performed well in my evaluation. The system meets its objectives of surveillance. Key improvement would include the provision of training in yellow fever surveillance to port health officers.

HSSP5: Reduction of turnaround time of HIV-1 viral load and early infant diagnosis results in Tanga region, a two years' experience
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Background: NIMR Tanga laboratory was capacitated with installation of PCR machine by the Ministry of Health in December 2019 for quantifying HIV-1 viral load and HIV-1 early diagnosis for clients of Tanga region. Before samples from Tanga region were sent to KCMC Molecular Laboratory for analysis. The exercise of sending samples to KCMC was time consuming, costly, and resulted to long turnaround time (TAT) of about one month. Long TAT can lead to delay in treatment initiation, poor patient management and even death of PLWHIV.
Objective: To reduce TAT of PCR quantification of HIV-1 viral load and early infant diagnosis of HIV-1 among PLWHIV from 8 districts of Tanga region.
Methodology: Plasma and dried blood spots samples from 8 districts of Tanga region were sent to NIMR Tanga laboratory for Polymerase chain reaction (PCR) using Cobas Ampliprep/TaqMan platform. After analysis results were sent to the respective health facilities through electronic sample referral system (eSRS) and later hard copies were returned to the facilities.
Results: Results shows in 2020 and 2021 a total 23,991 plasma samples for HIV-1 viral load were analysed whereas for HIV-1 early infant diagnosis a total of 838 dried blood spots samples has been analysed both by PCR. Laboratory TAT was reduced to 5 days while TAT at facility level at a maximum 14 days.
Conclusion: The Laboratory Turnaround time for HIV-1 viral load and early infant diagnosis of HIV-1 testing has been reduced to 5 days and 14 days at health facility levels in Tanga.

HSSP6: Readiness of public healthcare facilities on the management and referral of pre-eclampsia in Zanzibar

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Background: Proper management of pre-eclampsia depends on the availability of well-functioning healthcare facilities. Evidence showed that a significant number of pregnant women in Zanzibar are referred late and most ends up with eclampsia. This raised a concern of whether healthcare facilities are prepared enough for the management of pre-eclampsia.
Objective: To assess the readiness of all levels of public healthcare facilities in the management and referral of pre-eclampsia/eclampsia in terms of availability of supplies, equipment, test, drugs, referral practice, knowledgeable and skilled healthcare providers.
Methods: This was a descriptive cross-sectional study conducted in Zanzibar targeted all public healthcare facilities. A sample of 54 healthcare facilities was used and censor method was used to select secondary and tertiary health care facilities while systematic random sampling was used to select primary healthcare units. Physical observation, questionnaire and review of hospital records were used for data collection. Descriptive statistics was used for analysis.
Results: National, regional and district hospitals have all the required equipment, supplies and drugs compared to primary healthcare units where the significant shortage was observed in equipment (working oxygen cylinder 1(2.1%), ambu bag 10(21.7%) and strips for proteinuria 25(54.3%)), drugs (diazepam 11(23.9%), test (urine for protein test 29(63%)), and skilled healthcare providers 47(39.8%). All primary health care units had clear criteria for referring a patient with pre-eclampsia, but only 19(41.3%) provide pre-referral treatment and only 17(36.9%) had vehicles for transporting the referred patient.
Conclusion: There is a huge shortage of resources in lower healthcare facility level. Necessary measures should be taken to well-equip primary healthcare units to improve their capability to proper diagnosis, management, and timely referral of patients with pre-eclampsia.

HSSP7: Exploring intrinsic factors motivating community health volunteers to promote cervical cancer screening, Isiolo Sub-County, Kenya

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Background: Community Health Volunteers (CHVs) are instrumental health workers who provide healthcare services such as basic curative, promoting, and preventive healthcare services at the community level. While CHV's role is outlined at the policy level, their engagement at the county level is still sub-optimal. Unlike other cancers, cervical cancer is treatable when identified early by screening and early diagnosis. However, the uptake of screening services in Kenya is still low among eligible women. Therefore, to encourage uptake of screening by eligible women, CHVs need to be utilized to create awareness at the community level.
Objective: To explore the intrinsic motivation factors that influence CHVs in promoting cervical cancer screening.

Methodology: This was a qualitative study conducted in Isiolo Sub-County. 16 CHV leads were purposively selected to participate in individual interviews conducted between January and February 2021. The interviews were audio-taped, transcribed, and analyzed using thematic content analysis.
Results: The majority of the participants 14 out of 16 were competent having demonstrated knowledge of what cervical cancer/screening is. However, the majority (13 out of 16) did not know the type of screening services offered. All the participants confirmed having a good relationship with their supervisors. 9 out of 16 participants had been trained on cervical cancer. However, only 3 out of the 9 trained CHVs had been supervised while conducting household visits but not specifically on sensitization about cervical cancer screening. The average time spent each day doing CHV work was 3.6 hours hence the CHVs had the autonomy to plan their time. Participants rated their job satisfaction in relation to promoting cervical cancer screening very low at 2.8 on a scale of 10 due to lack of capacity building and facilitation to work diligently in the community. All the CHVs attributed their motivation to service to the community and to God. 11 out of 16 attributed their satisfaction to gaining and utilizing new knowledge.
Conclusion and recommendation: Other than remuneration, CHVs can be motivated intrinsically through close supervision by their supervisors, appreciation, and training. On-job training is needed to improve CHVs knowledge and close supervision done to ensure optimal performance by CHVs.

8. Innovation and health technologies

Innovation, defined as invention, adoption and diffusion and technologies has contributed substantially to creating solutions for various health care challenges in a timely and cost-effective manner. Health innovation and technologies focus on developments and translation of health technologies and innovations that can be used in healthcare systems. Health innovation and technologies can support the development of healthcare systems. They can also lead to 'new or improved' health policies, practices, systems, products and technologies, services, and delivery methods, patient education and satisfaction and improved access to healthcare without compromising security.

The advances and development of promising innovations and technologies like artificial intelligence, machine learning algorithms, cloud computing, big data/data science in health, and telemedicine, Internet of Things in healthcare, robotics, and wearable technologies, 3D printing, the quality, accessibility and efficiency of healthcare will continue to improve.

Healthcare is constantly changing and adapting to innovations and technologies support the high demand of access to healthcare and growing digitization of health information. The are several benefits of the innovation and technologies in health. These include; improvement in the efficiency, effectiveness, quality, sustainability, safety, and/or affordability of healthcare.

Despite the efforts to embrace technology in the health care sector, most LMICs still face a number of challenges including technical-level barriers, lack of policy and legal infrastructure and political and economic barriers. These call for the need to invest on collaborative efforts both at local and international levels with the aim of addressing these challenges so as to attain a stronger and universal health care system. Ongoing digitalization and the development of new health technologies and innovation has potential to support solutions and creating patient-centric healthcare systems that will accelerate attainment of the health-related goals of the 2030 Agenda for Sustainable Development Goals. This session included presentations on new innovations in health including innovative financing, digital technologies including application of artificial intelligence in health.

ITH1: Technology development capability: implication for health service delivery: a case of medical implants costing at MOI and TMDA in Tanzania

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Background: When you go to hospital, you expect to be treated on time. Tanzania among other country is experiencing difficult situation to make sure the road safety. WHO latest data published in 2018 Road Traffic Accidents Deaths in Tanzania reached 19,058 or 5.24% of total deaths. The issue of oversize or undersize is a common challenge in daily provision of orthopaedic services because of morphometric variations in different races where implants are imported (Mathias et al., 2020).
Objective : To explore costing, availability, and importation of Orthopedic implants at MOI and TMDA in Dar Es Salaam -Tanzania.
Methods: A cross-sectional study was conducted using qualitative questionnaires and desk review
Results: According to TMDA report since 2018 to 2021, the number of registered importers from both government and private sector has been increasing to 100%. It was found that more than 70% of the cost of treatment is on implants which was imported. The average profit/interest is 30% percent added to each implant from the original cost to a patient. For the total knee and total hip replacement, the cost may be more than six million Tanzania shillings to one patient of which is unaffordable to most of them. As of 2021, Muhimbili Orthopaedic institute uses about 2 billion Tshs importing/purchasing implants from the prime vendors.
Conclusion: Despite importation there is a shortage of implants whereby a patient may wait for a month up to one year. Most of these implants are imported from China, India, German, and Switzerland
Recommendation: The government can decide to support the establishment of the Medical Implants Centre by making sure the business plan is implemented by parastatal such as NIMR, COSTECH, MOI, STAMICO should jointly be as partners to make it run. Using bilateral agreement with expert organization/countries. Motivating private sector to invest. Develop a program to be taught at technical schools/universities

IHT2: Application of artificial intelligence in cancer diagnosis in Tanzania

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Background: Cancer ranks as a leading cause of death and an important barrier to increasing life expectancy in every country in the world. There were 19.3 million new cases and 10 million cancer deaths worldwide in 2020. In Tanzania, there were 40,464 new cancer cases of which 75-80% were diagnosed lately, with 26945 cancer related deaths in 2020. Accurate and robust pathological image analysis for cancer in Tanzania is time consuming and knowledge intensive, but it is essential for

cervical cancer diagnosis. With few pathologists, there is pathologists' workload which increases turnaround time and diagnostic errors. It is therefore imperative to develop valid and reliable tool histopathological image analysis and diagnosis of cancer which will assist pathologists to diagnose cancer in order to reduce workload and improve clinical efficiency and efficacy without unintended human bias during diagnosis.
Objective: To assess the accuracy of artificial intelligence in histopathological image analysis for cancer diagnosis in Tanzania
Methods: Specific procedures were used to identify, select, and process the proposed solution ranging from architectures, batch normalizations, optimization methods and evaluation methods. The dataset was obtained from public available Kaggle dataset with about 176,000 training images and 44,000 testing images. AI model used was deep convolutional neural networks. The performance of the proposed classification model was evaluated based on accuracy. The CNN model consisted of perfectly balanced classes hence binary cross-entropy loss function was used to train neural networks. The model was deployed on website by using django and hosted in local domain.
Results: Our innovative AI tool was consistently and nearly perfectly agreed with accuracy of 89% in held-out test with turnaround time of 2 minutes compared to turnaround time of optimum one to two days used by pathologists in interpreting the slides. This is in accordance with study about colorectal cancer where average kappa statistic was 0.896. This indicates necessity of using AI diagnostics in cancer.
Conclusion: First AI-generalizable tool which can handle pathological analysis without potential analysis. We are so proud to provide a novel solution that helps packing the clinically relevant task of cancerous cells detection into a straight-forward binary image classification task. This demonstrates the feasibility of the solution. However, our approach can still be improved by using a pre-trained model, assembling two or three models that tend to outperform single classifiers

IHT3: The Role of CHF-IMIS in health insurance scheme: a digital solution for enhancing penetration of health insurance coverage in Tanzania
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Co-authors: Nicholas S Kanisa[2], Ishengoma Josephat[2], Elizeus Rwezaura[2]
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Background: Community Health Funds (CHF) – is the government-initiated pre-payment insurance scheme which is operating within 26 regions in Tanzania mainland. CHF is underpinned by web-based software better known as Insurance Management Information system (IMIS) to enable member's enrolment, claims management and provision of health service in both online and off-line set up and processing of payment to health facilities. The IMIS solution was developed by local Tanzania Experts from PORALG, MOHCDGEC and NHIF with support from HPSS Project and adopted by other countries include Nepal, Niger, Mauritania, Chad, Cameroon, Malawi, and Gambia.
Objectives: To determine the role of CHF-IMIS system as a digital solution for enhancing penetration of the health insurance coverage in Tanzania.
Methodology: Data from the IMIS system, study of CHF operational Reports and Literature reviews were the methodology used to underpin the subject of this document. Analysis was done through Excel.
Results: The current number of beneficiaries for the scheme is 3.6 million which is 7.5 % against the

data from NBS in 2018 of Total Tanzania population. The Cumulative amount collected is TZS 25.4 billion as premium from July-2018 since improved CHF scheme started. 735,171 households enrolled between July 2018 to February 2022.TZS 17.4 billion paid to health facilities from July 2018 to February 2022.The statistics shows that between Nov-2021 to Jan-2022, about TZS 2.2 billion has been paid to the facilities. Average per month of TZS 738.7 million higher compared to TZS 662.0 million of last year.
Conclusion: Results shows clearly that the Implementation of CHF-IMIS system has greatly enhanced the penetration of health insurance coverage in Tanzania. The CHF- IMIS system enables Enrolment officers and Claim administrators to enroll members both when online and offline and Support inter-district and inter-region provision of health care (Portability) and these features and more has heightened the penetration of CHF insurance coverage country-wide.

IHT4: The use of a computerized data management system in health intervention projects
Presenting author: Ashraf Rwabigimbo[1*]
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Background: The NIMR Amani Medical Research Centre developed the Amani Integrated Data Collection (AIDC) kit which is a computerized data management system for standard classification, validity, integrity, consistency, security, accessibility, as efficient processing, and data integration. Collected data are vital for making informed decisions, measure intervention and meet required standards managing diseases and their vectors.
Objective: To test a data management system for the timely collection, compilation, and analysis of data in order to effective control diseases and their vector.
Method: In order to test the effectiveness of AIDC kit, technologies that allow a wide range of tools and platforms were combined. Therefore, an architecture of AIDC kit includes an application programming interface, a communication standard, an open function integration, and a middleware component. The Kit was used in various national surveys for diseases, vector as well as vector control interventions monitoring.
Result: Some of the health intervention evaluation projects already supported by the AIDC kit include Malaria Vector Entomological Surveillance (MVES), School Malaria Parasitological Survey (SMPS), Insecticide Resistance Monitoring (IRM), Long lasting insecticidal nets durability and insecticidal content monitoring, and Indoor Residual Spray with Vectron P.500. Through AIDC kit, a total of 263,322 data entries were submitted and processed.
Conclusion and recommendations: To evaluate and monitor the performance of a given health project, data from diverse angles such as pathogen, vector, control interventions, and human subject factors have been collected and collated by AIDC kit in such a way that statistically relevant analysis have been performed successfully. AIDC kit is recommended to be used in evaluation and monitoring the performance of interventions in heath projects. This system will save money and time in data collection and processing of data.

IHT5: ePOCT+, a digital health tool to improve care and reduce antibiotic prescription in pediatric outpatients in Tanzania: a cluster randomized controlled study
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Background: Management of sick children at primary health facilities remains of insufficient quality as health care workers lack appropriate diagnostics, supervision to improve their skills and decision support tools. In lack of guidance, clinicians tend to overprescribe antibiotics. Similarly, to this, missing a child in need of hospitalization puts them at a preventable risk of death.
Objectives: To determine if the use of the ePOCT+ digital health tool for case management of sick children aged 1 day to 15 years in primary care compared to routine care results in fewer antibiotic prescriptions and non-inferior clinical outcomes.
Methods: We performed a pilot cluster randomized study for which 8 health facilities in the Morogoro and Mbeya regions of Tanzania were randomized on a 1:1 ratio to either use ePOCT+ (4 intervention facilities) or routine care (4 control facilities) to manage sick children. The intervention included the use of ePOCT+ which guides health care workers on the diagnosis and treatment based on the inputted symptoms, signs, and tests, supported by point of care tests (CRP and hemoglobin test, pulse oximetry), and mentorship. The co-primary outcomes were a reduction in antibiotic prescription at the time of consultation, and non-inferiority in clinical failure on day 7.
Results: Between April and August 2021, 2699, patients were enrolled (1373 patients in intervention health facilities and 1326 patients in control health facilities). Day 7 clinical outcome was available in 1780 patients (66%) (831 from intervention facilities and 949 patients from control facilities). The use of ePOCT+ resulted in lower antibiotic prescription (22%) compared to control (62%), with a bit higher proportion of clinical cure in ePOCT+ (95%) than in in routine care (93%).
Conclusion: High antibiotic prescriptions may not necessarily mean increased cure rate. The pilot results from our study demonstrate that ePOCT+ may help reduce antibiotic prescriptions without a reduction in clinical cure.

IHT6: Performance of tuberculosis molecular bacterial load assay in urine from TB-HIV coinfected patients compared to Alere LAM and standard culture tests.

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Background: Tuberculosis is a major cause of high morbidity and mortality in people with co-infection with the Human Immune deficiency Virus. Of the 1.3 TB deaths reported in 2020, about 0.3 million were HIV infected. Detection of TB is a challenge in HIV patients due to the low bacillary burden and extra-pulmonary form of the disease. The GeneXpert MTB/RIF Assay and LAM tests have shown promising

results for the detection of TB in urine but are only useful for diagnosis. We assessed the performance of TB-MBLA in urine from TB-HIV co-infected patients for diagnosis and monitoring.
Methods: Urine samples were collected from 30 TB-HIV patients enrolled in the TB Sequel cohort study. Samples were preserved in Guanidine thiocyanate (GTC) prior to RNA extraction using 1 mL of urine and 4 mL of GTC. We used 0.1mL of raw urine for solid culture in Middlebrook 7H11 and 60uL for LAM Antigen test using Alere Determine Lipoarabinomannan (LAM). The remaining urine samples were concentrated and decontaminated with 4% NALC-NaOH method following the BD MGIT protocol.
Results: A total of 62 urine samples were collected; 3(5%) at baseline, 1(1.6%) at week 1, 18(29.03%) at week 2, 21(33.87%) at week 8 and 19(30.6%) at week 16. Of the 62 urine samples, 3(5%) were TB-MBLA positive for M. tb, 9(14.5%) were TB LAM Ag test positive and all samples were TB negative in MGIT liquid and in Middlebrook 7H11. The average TB-MBLA bacterial load (±SD) detected for positive urine samples was 1.39×102±1.55×102 eCFU/m.
Conclusions: TB-MBLA positivity in urine is slightly lower than in the LAM test but with a better yield than culture. TB-MBLA shows promising results in urine and would improve the current diagnostics and monitoring in TB-HIV co-infected patients, extra-pulmonary, and children who fail to expectorate sputum. Our ongoing study is further validating these results.

IHT7: Flow cytometric analysis of cell lineage and immune activation markers using minimal amounts of human whole blood - field method for remote settings
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Background: The standard procedure for cryopreservation of peripheral blood mononuclear cells is at −80 °C. While this provides the ideal freezing condition, laboratories in rural areas or field settings do not necessarily have access to a -80 °C freezer, but rather a -20 °C freezer. Remote laboratory settings such as those where studies on neglected tropical diseases are performed often lack a multicolor flow cytometer for analysis of immune cell subsets.
Objective: To test and establish a method which uses a small volume of whole blood for phenotypic characterization of T-cells which can be used in a remote field setting.
Methods: Samples collected from participants from the Upper East Region of Ghana during the screening activities for the TAKeOFF project were used. Extracellular antibody staining of 100µl of whole blood in EDTA was done before freezing the cells by using either the standard method or a new method where cells were frozen in −20 °C for 24hrs, transferred into a liquid nitrogen gas phase for 24h, and then to the liquid phase for long term storage and transportation. Thawing of the cells,

intracellular staining and data acquisition was done in the central laboratory. Data analysis and statistics were done using Flowjo and GraphPad Prism software, respectively.
Results: Expression levels of immune cell markers after cryopreservation were comparable to fresh whole blood samples from the same individuals. Moreover, the expression of markers was not altered even in samples stored for up to one year. Samples from both healthy controls and participants with lymphedema showed consistent results when markers for immune activation or regulatory CD4+ T-cells were analyzed.
Conclusions and recommendations: We have tested and established a novel method of processing a small volume of whole blood for flow cytometry analysis. This method is reliable and recommended for use in remote laboratory settings where it could be difficult to install a flow cytometer machine.

IHT8: Use of mHealth to improve retention to pre-exposure prophylaxis for HIV prevention among female sex workers: an evaluation of the Jichunge intervention in Dar es Salaam, Tanzania
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Background: Female sex workers are among groups at increased risk of HIV infection. Pre-exposure prophylaxis (PrEP) has been proven to be effective in preventing HIV transmission, but low retention to services poses a challenge to its effectiveness. Innovative interventions to tackle the problem and help achieve universal health coverage goals are called for.
Objective: To determine the effect of smartphone based mHealth application on retention to PrEP among female sex workers in Dar es Salaam.
Methods: Using respondent driven sampling, 470 female sex workers eligible for PrEP and who owned a smartphone were recruited. All participants were provided with a smartphone-based mHealth app (Jichunge app) which has multiple functionalities designed to promote PrEP use and retention among HIV at risk population. We utilized information collected during the baseline, month 1 follow-up, and data on the use of Jichunge app for a period of 30 days. Associations between PrEP retention and optimal use of different functionalities of the app was assessed using modified Poisson regression model with robust standard errors.
Results: Of 470 recruited participants, 253 (53.8%) were retained to PrEP services at month 1. Retention to PrEP services was significantly higher among those who opened the Jichunge app after installation (APR=1.4, 95% CI: 1.13-1.85), used gamification functions (APR=1.5, 95% CI: 1.18-1.89), visited PrEP editorial contents (APR=1.4, 95% CI:1.16-1.67), consulted a doctor or peer educator (APR=1.5, 95% CI:1.29-1.79), or engaged in the discussion with other PrEP users (APR=1.4, 95% CI:1.17-1.62).
Conclusion: The use of Jichunge mHealth application significantly increased retention to PrEP among female sex workers in Dar es Salaam. The results indicate that use of mHealth interventions hold potential to promote universal health coverage in a cascade of PrEP and other related interventions.

IHT9: Correlation of myeloperoxidase, neopterin and lipopolysacharide binding protein as markers of environmental enteropathy between HIV infected and non-infected adults in Mwanza, Tanzania

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Background: Environmental enteropathy (EE) is associated with malnutrition in children and for HIV-infected individuals, EE relate with HIV progression, poor antiretro viral therapy (ART) response and non-communicable diseases. Despite its importance, EE diagnosis is still a challenge. Small intestinal biopsy is a gold standard test for EE, but it is invasive and has a lot of challenges. Plasma (e.g., lipopolysaccharide binding protein (LBP)) and fecal (e.g., Myleloperoxidase (MPO) and neopterin (NEO)) biomarkers have emerged as important diagnostic tools but none of them is well validated for diagnosing EE. To increase sensitivity, investigators have been using a combination of many biomarkers to diagnose EE hence increasing burden and cost.
Objective: To determine the correlation between LBP, MPO and NEO biomarkers among HIV infected and non-infected adults so as to reduce a burden of using many biomarkers for diagnosing EE.
Methods: This study was cross-sectional involving 738 HIV-negative and positive adults randomly selected from REEHAD project, conducted between May and August 2021 at National Institute for Medical Research, Mwanza, Tanzania.
Results: This study involved 738 HIV-negative and positive adults, their mean age was 42.3 (SD 11.4), majority 423 (57.3%) were females and 422 (57.2%) were HIV-positive on ART. MPO and NEO showed marginal positive correlation among HIV-negative participants (r=0.20, P=0.08). After stratifying by sex and age; significant correlation was observed between MPO and NEO in HIV-negative females (r=0.28, P=0.04), LBP and NEO in HIV-positive participants within the 31-40 age group (r=0.45, P=0.01) and between MPO and NEO in HIV-negative participants within the 31-40 age group (r=0.51, P=0.004).
Conclusion: LBP, MPO and NEO could be the adequate tests for EE, but their correlation is modified by sex, age, and HIV status. There is a need of developing new biomarkers that are not influenced by age, sex, and HIV status.

IHT10: Potential of natural phenolic antioxidant compounds from bersama abyssinica (meliathaceae) for treatment of chronic diseases

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Background: Chronic diseases including cardiovascular, diabetes and cancer persist for a long time in the course of treatment affecting health and are currently the cause of many deaths. In most cases, the treatment of chronic infectious diseases especially Tuberculosis relies on conventional drugs which are currently becoming fruitless due to drug resistance and unpredicted complications in course of

treatment. However, herbal medicines have for a long time been used in prevention and treatment of chronic diseases including asthma and heart diseases in Africa.
Objective: In this study, we extracted metabolites and screened for active compounds with potential free radical scavenging and pharmacological activities from Bersama abyssinica, the plant commonly used in traditional medicine in Tanzania. B. abyssinica root, stembark and leaf were air dried, sequentially extracted in various solvents including petroleum ether, dichloromethane, ethylacetate and methanol to yield extracts and fractions.
Methods: The extracts and fractions were tested for the presence of several metabolites and antioxidant activity. The analysis of chemical compounds from resultant extracts was done by GC-MS for non-polar factions and LC-MS/MC for moderate polar extracts.
Results: High amount of phenolic acid, flavonoids and tannin were identified in ethylacetate fraction compared to ethanol, dichloromethane, and petroleum ether. The GC-MS analysis of petroleum ether extract of B. abyssinica stem back yielded twelve (12) compounds with varying composition. The most abundant compounds were 2-Butenoic acid, 3-methyl-, ethyl ester comprising 33.8%, n-Hexadecanoic acid comprising 16.7% and Ethanolpentamethyl- yielded in 16.7%. The LC-MS/MS analysis of Ethyl acetate fractions yielded 20 compounds including; Mangiferin and Isoquercitin were abundant in leaves, stembark, and roots. Lastly, ethyl vanillate was identified in both roots and leaves whereas Quercitrin and 7,8-Dimethoxycoumarin were found in stembark and root.
Conclusion: These findings indicated that B. abyssinica is rich in phenolic compounds ranging from phenolic acids, flavonoids and coumarin that possess high antioxidant and pharmacological properties potential for treatment of chronic diseases

IHT11: Acceptability of a digital adherence tool (EvriMED) for promoting adherence to treatment among tuberculosis patients in Kilimanjaro Tanzania

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Background: Tuberculosis (TB) treatment forms the cornerstone of TB control, but inadequate adherence to treatment is a major factor that leads to multi-drug resistant (MDR) TB. The EvriMED device is an internet-enabled pill box that provides real time medication monitoring including sending short message service (SMS) reminder cues and giving tailored feedback on adherence patterns. The aim of our study was to assess the acceptability of EvriMED for promoting adherence to adult susceptible TB patients in Kilimanjaro Tanzania.
Methods: We conducted a qualitative study among TB patients who participated in our cluster randomised trial done in Kilimanjaro, Tanzania in which we investigated the effectiveness of evriMED. We purposively selected 25 participants who used evriMED for six months for an in-depth interview as we believed 25 would be adequate to reach saturation of data. We determined acceptability using the Sekhon framework of acceptability which comprises of seven constructs: affective altitude, perceived burden, perceived effectiveness, opportunity costs, ethicality, self-efficacy, and intervention coherence. Interview transcripts were independently coded by two researchers and analysed to identify themes using content analyses.

Results: EvriMED was considered acceptable as the majority mentioned perceived improved adherence to medication (perceived effectiveness), great appearance of the device (affective attitude), greater family support to take medications (ethicality) and privacy regarding participant status or diseases (ethicality). Some participants mentioned that devices are too large (affective attitude), incorrect understanding of the intervention (intervention coherence), giving up their works in order to adhere with time of intake (opportunity costs) and fear of stigma and unwanted disclosure (perceived burden). These may lead to lower acceptability.
Conclusions: The device was found to be highly acceptable. However, the appearance of the device could be adapted, more education on working mechanism is needed and strategies for use during work and stigma decreasing interventions should be developed as implementations strategies.

IHT12: Implementation of intellectual property policy in selected research communities of Tanzania
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Background: Optimally implemented intellectual property policy is a useful tool that can be used to address challenges faced by universities and research institutions in protecting and commercializing intellectual properties generated through research activities. Although very few institutions in Tanzania have intellectual property policy, it is not known to what extent they implement such policy.
Objectives: To review and assess implementation of intellectual property policy in universities and health research institutions in Tanzania.
Methods: Data was collected through online quantitative survey, in-depth interviews with 8 key informants and reviews of five accessed intellectual property policy documents.
Results: In most institutions, the reason for developing intellectual property policy was to effectively manage the generated intellectual properties (86.7%). But only one third of the respondents affirmed that intellectual property policy is being implanted in their institutions. Responses from key informants confirmed sub-optimal or lack of implementation of intellectual property policies in their institutions. The reason being limited awareness on existing institutions' intellectual property policy, and in some institutions, lack of guidelines for implementation of intellectual property policy. Rights of holders of traditional medicine knowledge have not been adequately considered in the reviewed intellectual property policy documents.
Conclusion and recommendations: Intellectual property policy is either sub-optimally or not implemented at all in the selected study institutions. Effective approaches for dissemination of intellectual property policy and guidelines in research and academic communities will enhance implementation of the policy. There is a need to recognize and consider the rights of holders of Indigenous or traditional knowledge.

IHT13: Capacity for Intellectual Property Management in universities and research institutions in Tanzania
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Background: The impact of Intellectual property depends on how it is used, who uses it, and for what purpose. There is limited information on the capacity of universities and health research institutions in Tanzania to manage intellectual property.
Objective: To assess the capacity of universities and health research institutions in Tanzania to manage intellectual property generated through research activities.
Methods: A total of 148 individuals from 18 from health research institutions and universities in Tanzania responded to the online.
Results: Respondents indicated that institutions do not have mechanisms, structures, frameworks, and human resource with skills for effective management of intellectual property. Majority of the universities and universities have inadequate capacity for intellectual property management. Slightly over a third (37.5%) of respondents claimed that their institutions support innovation and one fifth (22.2%) affirmed that their institutions have conducive environment for entrepreneurship and resources to support commercialization of intellectual property and operationalization of intellectual property management office. Less than half of respondents have ever received intellectual property trainings and know their roles in intellectual property protection and commercialization. Majority do not know where to get intellectual property information. Capacity required to translate research results into tradable assets is limited to a very few respondents and over 60% expressed dissatisfaction with the incentives provided by their institutions following commercialization of intellectual property created by them.
Conclusion: Universities and health research institutions in Tanzania have inadequate capacity for intellectual property management.

IHT14: Community participation in the installation of 3D window double screens traps for mosquitoes' control in Muheza district Tanzania

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Background: The combination of more than one mosquito control tool has a potential to further reduce mosquito bites.
Objective: To assess community participation in the installation of an innovative window double screens and its associated implementation challenges.
Methods: Focus group discussions were conducted with local carpenters, heads of households and women from installed 3D window double screen households. Data was analyzed using thematic analysis approach.
Results: Community members voluntarily participated in the installation of the traps through hands on construction, supporting and advising. Actual constructions included screen frames construction, deconstruction of wall windows and fixing cones on screens and plastering the attached windows. Support included carrying screens from the construction points to the household, preparing the house for installation by removing objects and measuring window size. Advising constructions include all supportive ideas. Having a carpenter from the same village was perceived as advantageous for village dwellers, as it was easier to access them in time of traps repair. Change in timber type reduced participation in the installation exercise. However, participation depended on the availability of labor. Some felt it was the responsibility of the project and demanded pay. It was challenging to install in houses built from mud and poles. Miscommunication of window sizes influenced the pace, quality of

the screen installation exercise. The screen designs were admired for their aesthetics value but also trapping mosquitoes from inside and outside was reported as very innovative as the traps protected from other harmful insects.
Conclusion: Overall, community participation in the installation process generated a lot of talk on malaria and its future control. The product ability to perform beyond a tool of malaria control have increased acceptability and participation. When done properly community engagement in malaria control may contribute to the reduction of malaria transmission in endemic areas.

IHT15: Automatic cervical cancer diagnosis on a smartphone using deep learning method
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Background: Cervical cancer (CC) is a major public health concern in developing countries due to financial and specialists' constraints. World Health Organization recommended Visual inspection with acetic acid (VIA) to be used for primary (CC) screening or triage of human papillomavirus-positive women living in low-resource settings. By using a colposcope, digital cervix images are acquired for visualizing the presence of precancerous lesions. However, a colposcope is bulky, expensive, and a specialist must be present. Smartphone-based imaging technologies have recently had a substantial impact on medical practice by providing a cost-effective and quick examination at remote.
Objective: To investigate whether deep learning-based artificial intelligence approaches could automate the screening procedure on a smartphone to improve early treatment.
Methods: Using cervix images from SEVIA dataset which contain over 50,000 images of VIA test results, the images were taken with a smartphone SEVIA application at health facilities in Tanzania. A deep pre-trained Convolutional Neural Network was applied to 241 SEVIA image datasets, a total of 192 images were selected as training set and 49 as a validation/test set. These images were manually labelled by an experienced oncologist as VIA positive and VIA negative, to attain fine labelled cervical images.
Results: The model was able to get 93% accuracy, 93% sensitivity and 98% Area under curve (AUC) on the validation/test set. This could be a solution for screening CC in countries that suffer from the lack of expensive tools like colposcopes and specialists. Also, Congenital Transformation Zone (CTZ) and Sexual Transmitted Infections (STI's) which mimic the characteristics of positive VIA was identified in many images of SEVIA dataset.
Conclusion: The AI model can classify the VIA positive and negative by using a cervix image from a smartphone. This work suggests that using smartphone automated visual examination could be a useful adjunct to health-workers for early screening and treatment of CC. However, for practical use, more training data size is required for better generalization, also CTZ and STI's must be evaluated to reduce the misclassification of the model.

IHT16: "Xpert MTB/RIF ultra-cycle threshold values as a predictor of sputum culture conversion during TB treatment among adult pulmonary TB patients in Tanzania"

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Background: The Xpert MTB/RIF Ultra (Xpert Ultra) assay offers rapid diagnosis of tuberculosis (TB) and quantitative estimation of bacterial burden through Cycle threshold (Ct) values.
Objective: To assess the association of Xpert Ultra Ct values at the time of TB diagnosis in predicting sputum culture conversion at month 2 and 6 post TB treatment initiation among adult pulmonary TB (PTB) patients in Mbeya Tanzania.
Methods: Information were obtained from adults PTB patients participating in the NAC-TB sub study of TB Sequel cohort, which examine if oral N-acetylycysteine (NAC) could restore Glutathione and prevent lung injury in TB patients. Participants were enrolled at the time of TB diagnosis and were followed up for at least 2 years. About half of the participants received NAC in addition to standard TB and HIV therapy. Information on demographics, HIV status, Xpert ultra, and culture results at enrollment, and subsequent culture results at month 2 and 6 were extracted from the NAC-TB database. The association between Xpert Ultra Ct values and culture conversion at month 2 and 6 were determined using multivariable logistic regression.
Results: Between March 2019 and August 2020, 90 participants were enrolled. The median age was 34 (IQR: 28-40) years, 64 (71.9%) were male, and 23 (25.6) were HIV positive. The median Xpert Ultra Ct values was 16.2 (IQR; 16.1-16.3). At month 2 and month 6 (end of TB treatment), 45/87 (51.7%) and 5/73(6.9%) participants remained culture positive, respectively. Xpert Ultra Ct values at the time of TB diagnosis showed no association with sputum culture conversion at month 2 and 6 during TB treatment.
Conclusion: Over half of adult TB patient remain culture positive at the end of intensive phase of TB treatment. Xpert Ultra Ct values at the time of TB diagnosis shows no association with sputum culture conversion during TB treatment.

IHT17: Modern data mining technique: COVID 19 news analysis

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Background: Data mining is an evolving field which involves the process of digging through data to discover the patterns of the data, hidden connections, correlations, and trends within large data and can be used to predict future trends. Data mining using human readers take long time and even very hard to generate the metrics for data analysis.
Objective: To analyze news on COVID-19.
Methods: A literature search was conducted on 28 to 15 February 2022 from 1445hrs to 1921hrs in the VOA website using the following pre-defined key words. 40,520 articles were identified. Duplicates

and nonrelevant articles were removed in the process of cleaning the dataset. A total of 15,720 articles were included in this analysis. Furthermore, by using the link column we searched for the counts of words from the VOA website news content to categorize the news by having additional seven columns for news categories.
Results: The COVID-19 news in March 2020, April 2020 and May 2020 were published highly compared to the other months. The news about vaccines continued to be popular in the whole year 2021. From May Delta variant news started to be very popular until November 2021 when the Omicron variant started to dominate. The relationship between deaths and variants news is not much clearly shown because the variants news was not being reported from the beginning of the pandemic.
Conclusion: Modern data mining techniques such as the use of python has proved to be strong and useful tool in data mining. This could save time and resource to achieve the intended goal.

Infectious diseases and antimicrobial resistance

Infectious diseases are illness due to a pathogen or its toxic product, which arises through transmission from an infected person, an infected animal, or a contaminated inanimate object to a susceptible host. They range from parasites, bacteria, viruses, fungi, or worms and soil transmitted helminths and are more likely to affect the poor and marginalized communities where the health systems are often weak. The diseases have dramatic economic consequences for individuals and communities which in turn exacerbate poverty hence a major public health threat causing majority of the morbidity and mortality globally.

Importantly, Antimicrobial Resistance (AMR) is increasingly a serious public health threat to human health globally and risk to attainment of SDG related goals. Case management and control strategies relies heavily on the effectiveness of the use of antiviral, antiparasitic, antibacterial and antifungal agents. The effect of AMR includes increased incidence, mortality, prolonged duration of hospital stays, and overwhelming the health system due to increased healthcare costs. It is estimated that approximately 10 million people could die annually from AMR by 2050.

Thus, AMR is crucial to making policy decision to inform prevention and control strategies, antimicrobial treatment options and research and development of new vaccines and therapeutics. The session includes presentation and deliberations on studies that reported on epidemiology of infectious diseases, patterns of antimicrobial resistance in the country and results of interventions on infectious diseases and evaluation of new diagnostic tests and methods. To prevent the threat of the infectious disease and AMR, increased investment, and efforts in strengthening health systems and research to develop effective vaccines, efficacious treatment regimen as well as advanced diagnostic technologies is needed.

INF1: AMR stewardship; involvement of primary healthcare facilities

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Background: Antibiotic use requires regular monitoring to prevent emergence of antibiotic resistance.
Objectives: To assess antibiotic prescribing patterns at health care facilities (HCF) in Ilala district, Tanzania.
Methods: A one-year retrospective study was conducted in four HCFs using WHO/International

Network of Rational Use of Drugs (INRUD) core prescribing indicators. Factors associated with antibiotic prescription were analysed using logistic regression model.
Results: A total of 604 prescriptions were reviewed. Patients had median age (IQR) of 15 (4–31) years with majority having upper respiratory tract infection 33.3% (n=201), urinary tract infection 31.1% (n=188) or diarrhoea 21.2% (n=128). Out of 624 prescribed antibiotics, amoxicillin was the most common (22.7%), followed by ciprofloxacin (13.6%) and metronidazole (11.6%). The studied HCFs had an average of 1.99 medicines prescribed per consultation (reference: 1.6–1.8). Of 1203 medicines prescribed, 51.9% (n=624) were antibiotics (reference: 20.0%–26.8%). Additionally, 97.6% (n=609) of the antibiotics appeared on the national essential medicines list, whereby 84.4% (n=510) were prescribed by generic names (reference: 100%). Patients with peptic ulcers had a 4.4-fold higher chance of receiving antibiotics [adjusted odds ratio (aOR)=4.4, 95% CI=1.918–10.13, P=0.0001] while patients with diarrhoea had a 2.6-fold higher chance of receiving at least one antibiotic (aOR=2.6, 95% CI=1.206–5.491, P=0.015).
Conclusions: We found inappropriate use of antibiotics in the studied primary HCFs. Antibiotic stewardship programmes should be extended to primary HCFs found in Ilala district.

INF2: Can antimicrobial use in animals help us understand antimicrobial use in humans? examining narratives of use among livestock keepers in Arusha region

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Background: The misuse of antimicrobials and anthelminthics on farms, hospitals, and communities, promotes the emergence and spread of antimicrobial resistance. Resistant microorganisms can be transmitted between people and animals through a diverse set of pathways, hence the drivers of AMR prevalence in animals may impact prevalence in humans. Consequently, how people use antimicrobials on their animals and themselves holds important implication for the spatial distribution of AMR.
Objective: To explore knowledge, attitudes, and practices related to AMU in agro-pastoral production systems, with the goal to understand how people utilize antimicrobials in animal health and whether patterns of utilization inform use in people.
Methods: The study was conducted in Arumeru District, Arusha Region. A mixed methods approach was used. In-depth interviews were conducted with animal health professionals (AHPs) and focus group discussions with farmers. KAP survey was also used. Themes were produced using a thematic analytical approach.
Results: AMR was perceived as largely caused by both farmers and AHP practices. They included the failure to complete prescribed dosage, delaying in the treatment of an ill animal, knowingly under dosing or overdosing an animal, improper diagnosis (and misdiagnosis). AMR was also perceived to be caused by fake drugs and as a result of "untreatable and severe diseases. Other structural factors discussed included inadequate local AHPs, leading to self-treatment of animals by farmers, and animal health management be a responsibility of the farmer. These results are presented in conjunction with findings in the literature about antimicrobial use in humans.

Conclusions and recommendations: Factors affecting AMU use in animals do not seem to differ from those affecting antibiotic use in humans. Self-treatment practices are prevalent in both humans and animals. Similar patterns suggest that One Health behavioural interventions to promote proper antimicrobial use could be effective in both public and animal health sectors.

INF3: Severe sepsis due to chryseobacterium indologenes a possible organism resistant to multiple antibiotics: a case study in Mbeya, Tanzania

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Background: Chryseobacterium indologenes is a yellow pigmented, gram-negative rod, oxidase-positive, non-glucose-fermenting bacteria. It is an environmental organism usually an opportunistic pathogen associated with nosocomial infections. This case, affecting a fit, demonstrates that it may be an agent of severe sepsis. C. indologenes typically exhibits resistance to multiple antibiotics.
Objectives: To isolate the organism causing infection and to perform Antimicrobial Sensitivity Test from isolated organism.
Methodology: We collected a pus from severe sepsis and suspend in a sterile 15ml falcon tube containing 0.85% Nacl and maintained at 2-80C. We inoculated a sample on Muller Hinton agar, Blood agar and incubated for 24hours and observe the morphological characteristics. We identified the organism by Gram stain, oxidase test and API test. We did the Antimicrobial Sensitivity test to the isolated organism per protocol. We analyzed the data using Microsoft excel and presented by table and figures.
Results: We observed yellow pigmented colonies from Muller Hinton Ager, Beta hemolysis in blood agar, Gram- negative rods microscopically. Biochemically we observed Oxidase positive and in API 20NE the organism isolated was Chryseobacterium indologenes. From antimicrobial sensitivity testing, Imipenem and Gentamycin were sensitive, Azithromycin was intermediate sensitive, Amoxicillin clavulanate, Chloramphenicol, Trimethoprim sulphamethoxazole, and Cefepime, Doxycycline, Ceftazidime and Ceftriaxone were resistant to the bacteria.
Discussion and recommendations: From the results Chryseobacterium indologenes was isolated and among ten antibiotics, two antibiotics Imipenem and Gentamycin were sensitive, one antibiotic Azithromycin was intermediate sensitive, and seven antibiotics were resistant to the bacteria isolated. We concluded that Chryseobacterium indologenes shows resistance to many antibiotics. We recommend that Imipenem and Gentamycin should be used for treatment of this case, Doctors and clinicians should take the history of the patients and ask the type of antibiotics used before to avoid giving the same antibiotic and culture and sensitivity should be requested.

INF4: Ant-microbial resistance surveillance system evaluation

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Background: Antimicrobials are agents that are used to cure infections caused by microorganisms like Bacteria, Fungi, Viruses, and parasites. The introduction of antimicrobials in the 1940s, have been lifesaving. Morbidity and mortality have been reduced significantly due to the invention of antimicrobials. Antimicrobial resistance (AMR) is a condition that occurs when pathogens change in a course of time and no longer respond to medicine making the disease difficult to treat and expanding the risk of disease spread, severity, and mortality. The burden of AMR is estimated to range from 4.1% to 92.9%. AMR is globally monitored by the Global antimicrobial resistance surveillance system
Objectives: To evaluate the performance of the AMR surveillance system from January 2021 to December 2021.
Methodology: This evaluation was conducted at Temeke RRH, Morogoro RRH, and NPHL. 2021 AMR surveillance data were reviewed. Surveillance staff was interviewed based on convenience Data were entered and cleaned with the Microsoft Excel program. Analysis was done by Epi Info 7. Descriptive statistics were used to summarize the data. Data were presented in tables and charts.
Results: AMR surveillance was found to be useful and important in the prevention and control of AMR. All laboratory staff in the AMR surveillance system were trained on the AMR surveillance system. Only 20% of the clinician were trained on the AMR surveillance system. Data were complete in more than 90%. Donors fund the system more than 50%.
Conclusion: AMR surveillance system was useful in providing data for public health policy and planning for AMR prevention and control. AMR surveillance data has facilitated the preparation of Hospital antibiogram. Findings from this evaluation provide a starting point for AMR surveillance system improvement. Increasing the number of sentinel sites is important for surveillance of AMR.

INF5: Review of lessons from COVID -19 pandemic
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Background: The current COVID-19 pandemic is theorized to end with worldwide endemicity. As the disease was new to the scientific community, its pop up was handled with various albeit debatable approaches the world over. This paper reviews some of the most controversial measures that many authorities took in response to the pandemic.
Objective: To logically suggest proper options for the handling COVID-19 disease basing on scientific evidence
Methods: This is a review paper. It contains revisiting guidelines suggested by WHO; policy response by nations; debates in the scientific community and consequences on various choices made by different authorities all over the world.
Results: Five areas of controversies have been identified and discussed. These areas include opinionated versus science (evidence) based decisions; public health approach versus individualized medicine; the role of natural immunity; healthy living; and information sharing.
Conclusion: Nations still have the opportunity to revisit and give a second thought to their approaches, policies and regulation regarding the ongoing pandemic and its anticipated fate in the globe.

INF6: Awareness and willingness to use HIV oral pre-exposure prophylaxis among people who inject drugs in Dar es Salaam, Tanzania: a cross-sectional survey

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Background: People who inject drugs (PWID) are at increased risk of contracting HIV. Pre-exposure prophylaxis (PrEP) could help in HIV prevention for PWID. However, little is known about the awareness and willingness to use PrEP. This study reports the awareness of and willingness to use PrEP and the associated factors among PWID in Tanzania.
Methods: A cross-sectional survey was conducted using respondent-driven sampling (RDS) to recruit PWIDs in Dar es Salaam, Tanzania. Data were collected using an interviewer-administered questionnaire. Chi-square statistical test was used during data analysis. The P-value of < 0.05 was used to ascertain the statistically significant relationship. IBM SPSS Statistics 25.0 was used to analyze the data.
Results: The analysis consisted of 260 PWID. The mean age of the respondents was 39.0 years with a standard deviation (SD) of ±7.5. Most of the respondents were male (89.2%) with primary education (67.7%). Despite the low awareness of PrEP (15.8%), the majority (91.9%) were willing to use PrEP. Both awareness of and willingness to use PrEP were associated with gender (p = .002 and p = <.001), awareness of HIV prevention programs (p = <.001 and p = .006), selling sex (p = .010 and p = .021), and frequency of condomless sexual intercourse (p = .029 and p = .025) respectively. In multivariable logistic regression, only gender(p=0.046) was related to awareness of PrEP while awareness of HIV prevention programs (p=0.009), the risk level of HIV infection(p=<.001), number of sexual partners(p=0.046), and frequency of condomless sex(p=0.032) were associated with willingness to use PrEP. Other factors were not statistically significant.
Conclusions: Despite low awareness, PWIDs are highly willing to use PrEP. Future research should assess the acceptability of injectable PrEP for PWID, as their acquaintance with injection may make the formulation more practical.

INF7: Addressing the drivers of HIV epidemic; experience of a mobile HTS services in the Southern highlands zone, Tanzania

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Background: Global HIV epidemic is disproportionately higher in SSA, accounting for more than 70% of the burden. Addressing specific drivers of the HIV infection through mobile HIV Testing Services (mHTS) targeting Key populations is essential to HIV epidemic control. We assessed the impact of mHTS to Key and Priority populations at addressing factors that increase risk of HIV transmission in selected hotspots within Mbeya and Songwe regions.
Methods: Since 2016, NIMR-Mbeya through mHTS has been working with PEPFAR to support HIV interventions in identified hotspots and local health facilities. A comprehensive HIV prevention package which includes health education and screening for drivers of HIV infection is being offered to

clients prior to HIV testing. Records of clients served by the mHTS from 2020 to 2021 were reviewed and analyzed using STATA version 15. Descriptive statistics were summarized as frequencies and percentages for categorical variables. Adjusted odds ratios with 95% CI for drivers of HIV epidemic were estimated using multivariable logistic regression models.
Results: Of the 8853 clients served, 3717 (42%) were aged between 15 – 24 years. The median age was 25(18-36) years. The majority 5550 (62.7%) were male, most clients 7329 (82.8%) had primary education. Nearly half of the total clients 4332 (48.9%) were married. A total of 377 (4.3%) clients had at least one STI syndrome, genital discharge 281 (74.5%) was the most observed syndrome. Clients with STI syndrome were four times more likely to be HIV positive (AOR: 4.74, 95% CI, 1.16 – 19.39). After controlling for age, level of education and marital status Uncircumcised clients had twice the odd of being HIV positive compared to circumcised participants (AOR: 2.66, 95% CI, 1.62 – 4.37).
Conclusion: The observed level of STI syndromes in this population is high. Circumcision status affected HIV positivity. Targeted and comprehensive Mobile HIV services may be employed as effective intervention in areas with high HIV prevalence. However, in low HIV prevalence, the suitability of this approach warrants further research.

INF8: The role of maternal viral load at delivery in profiling the risk of mother to child transmission: Preliminary results from LIFE study in Tanzania

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Background: High maternal viral load among others, is a criterion to determine the risk of mother to child transmission (MTCT). Viral load at delivery is yet to be adopted programmatically. This study aimed at assessing the role of maternal viral load at delivery in determining MTCT risk and eventual HIV prophylaxis provided to the new-borns.
Methodology: This analysis was based on data collected from an ongoing LIFE study that was conducted in 14 health facilities of Mbeya and Songwe regions. Mother infant pairs were enrolled at delivery. Mothers in the intervention arm (arm A) had a point of care viral load performed using Xpert-HIV-1 VL assay, while those in the standard of care arm (arm B) were tested according to programmatic recommendations. Subsequent HIV status of the infants was determined at birth, 6 weeks and 12 weeks using whole blood samples.
Results: A total of 2529 HIV positive mothers were enrolled between 2019 and 2021 (1184 in arm A, and 1345 in arm B). The mean age was 30 years. The median time since HIV diagnosis was 29 months. Almost all the mothers were on ART at the time of delivery 2501/2529 (98.9%). High maternal viral load at delivery was strongly associated with infant HIV infection (OR 9.0 CI 2.5, 39.1). Those whose mothers had a PoC viral load were more likely to have been given ePNP compared to those whose mothers did not (6.6% Vs 2.1%). About a third (71/202) of infants were categorized as having high MTCT risk solely based PoC viral load at delivery.

Conclusion: Maternal viral load testing at delivery has shown a significant role in identifying mother infant pairs with a high risk of vertical transmission of HIV and the choice of postnatal prophylaxis to the new-born.

INF9: HIV testing and linkage to care - a case of a mobile diagnostic and counseling service in Mbeya, Tanzania; a quantitative study

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Background: HIV-care programmes are faced with significant challenges in getting newly diagnosed People Living with Human Immunodeficiency Virus (PLHIV) linked to care despite massive investment in HIV prevention, treatment, and care.
Objective: To assess the performance of mobile HIV Testing and Counseling service (mHTC) in provision of HIV-testing and linkage to care of newly diagnosed PLHIV from Key and Vulnerable Populations (KVPs).
Methods: A retrospective review of the records of 25,248 clients was extracted from the mHTC database from October-2016 to September-2018.
Results: Of 25,248 clients, 51.71% were in 25-45 years age group, 55.4% were males, 60.5% were married and 62.1% had primary level of education. The median age of clients was 31 (IQR: 23-42) years. Out of the clients tested, 800 (3.17%) were diagnosed HIV-positive. Positivity was high among females 450 (4%), age group 25-45 years 538 (4.12%), divorced 202 (7.41%) and clients with primary level of education 504 (3.21%). An association between HIV status and sex, age group, relationship status and level of education was observed (P<0001). Out of the 800 HIV-positive clients, 418 (52.30%) were successfully linked to care. Among the positive clients, 5/6 (83.33%) children below 15 years old, 238/450 (52.89%) females and 39/64 (60.94%) widows were successfully linked to care. In the multivariable log binomial regression model age of the clients was associated with successful linkage to care. The mHTC was able to reach KVP clients; overall linkage for both sexes was 52.30% below the recommended UNAIDS 90-90-90 target. Raising the need to address the challenges associated with linkage and specific care for KVPs as a subset of the general population.
Conclusion: The mHTC has shown that it is feasible to improve the reach of KVP clients; however, further research is required to examine the quality of this service at the community level.

INF10: Unprotected sex among female sex workers in Dar es Salaam: support for the ongoing scale up of pre-exposure prophylaxis in Tanzania

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Background: The HIV epidemic disproportionally affects female sex workers in Tanzania with 15% of female sex workers living with HIV in Dar es Salaam. Condoms is one important prevention tool, while

Pre-exposure prophylaxis (PrEP), daily antiretroviral medication used as HIV prevention, is currently being introduced.
Objective: To reflect on the need to scale-up this biomedical intervention based on estimated rates of unprotected sex prior to PrEP initiation.
Methods: We collected data from a cohort of 470 female sex workers initiating PrEP in Dar es Salaam from March-July 2021 using respondent driven sampling. Weighted prevalence for sexual practices were calculated using STATA/SE 16.0.
Results: Half (50.7%) reported to have had unprotected sex at last vaginal sex with clients. Of the 28.2 % who reported ever having had anal sex with clients, half (50.4%) did not use condom during last anal sex. The majority had steady partner(s) (64.4 %), and 85.2 % reported not using condom at last vaginal sex with this partner(s). For the 10.7 % of women reporting to have anal sex with a steady partner, 81.4% did not use condom last anal sex. Some of the reasons for not obtaining a condom when needed were cost, stockout, not knowing where to obtain it, being drunk and things happening too fast. Close to half reported to have accepted condomless sex for more pay (46.9 %), while 48.0 % reported to have refused sex with a partner who opposed condom use.
Discussion: Unprotected sex was common among female sex workers initiating PrEP in Dar es Salaam with non-use related to individual, social and structural constraints. The need for additional ways of protecting oneself from HIV infection seems clear, and this is among the reasons why the ongoing scale-up of PrEP in Tanzania may be of considerable importance.

INF11: The relationship between household socioeconomic factors and HIV prevalence among under five-year children in Muheza district, Tanzania

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Background: There are pieces of evidence of the association between socioeconomic factors and HIV prevalence in sub-Saharan Africa. However, there is a dearth of information on such a relationship in Tanzania.
Objective: To determine the relationship between household socioeconomic factors and HIV prevalence among under five-year children in Muheza district, Tanzania.
Methods: A facility-based study among HIV exposed children with their respective mothers/guardians was conducted from June 2015 to June 2016. Information on the HIV status of the child and household socio-demographic characteristics were analyzed in the STATA version 13.0.
Results: A total of 576 child-mother/guardian pairs were interviewed. Sixty-one (10.6%) children were confirmed to be HIV positive. Higher odds of HIV infection were observed among children aged more than two years (AOR = 4.5, 95% CI 2.4-8.5) than among the relatively younger children. The odds of HIV infection were 1.8 times higher among children living in rural (AOR = 1.8, 95% CI 1.0-3.5) than in urban areas. The odds of HIV infection were found to be lower among children belonging to the heads of households with secondary and high levels of education (AOR = 0.5, 95% CI 0.2-0.9); P=0.04, those living in wealthier households (AOR = 0.5, 95% CI 0.3-0.9; P=0.03) and those whose mothers/guardians had good knowledge of HIV (AOR = 0.2, 95% CI 0.1-0.3; P<0.001) compared to their counterparts.

Conclusion: Children with the heads of households having high educational levels, those from wealthier households, and belonging to mothers/guardians with good knowledge of HIV were associated with reduced odds of acquiring HIV infection among this paediatric population in Muheza. These findings emphasize the need for economic empowerment of the people as well as advocacy for continued education and optimizing sufficient knowledge of HIV at the household level as strategies for HIV prevention and control.

INF12: HEID and uptake of postnatal prophylaxis among infants born to HIV positive mothers: a prospective study

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Background: HIV Early Infant Diagnosis (HEID) and treatment are critical to prevent morbidity and mortality in HIV-infected children. Point-of-Care (PoC) technology has the potential to overcome the challenges related to centralize laboratory testing such as long turn-around time and low retention in care. We investigated the HEID, and uptake of Postnatal Prophylaxis in HIV exposed infant under pragmatic setting in Tanzania.
Methods: In this prospective study we purposively selected 24 health facilities performing PoC HEID testing in 9 regions in Tanzania mainland. Mother-infant pairs were assessed for eligibility at week 6 post-delivery. The PoC HEID was performed at week 6 for all HIV exposed infants and in those who had a negative test, a repeat PoC HEID test was offered at week 12. Descriptive statistics and measures of association were used to analyze the data.
Results: Between July and October 2020, 640 infants (from 629 mothers) were enrolled. Positivity rate at 6 weeks post-delivery was 0.3% (2 HIV infected babies out of 640) with no incremental yield in positivity when additional PoC HEID test was repeated at week 12 post-delivery. More than 90% of the HIV exposed infants were initiated on Nevirapine mono prophylaxis, while 8/96 (8.3%) were categorized as high-risk for Mother to Child Transmission (MTCT) and were initiated on enhanced prophylaxis. In those who were categorized as high risk, only 6/96 (6.3%) had nucleic-acid test at birth as per the Tanzanian National HIV testing algorithm.
Conclusion: In our study we observed a good uptake of HEID services overall, and low positivity rate pointing out to the effectiveness of Prevention of Mother to Child Transmission intervention. Uptake of birth testing and initiation of ePNP in high-risk infant remain low.

INF13: Evaluation of art-third line treatment scaling-up surveillance system in Tabora region from January to December 2021

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Background: The global campaign of scaling-up of antiretroviral treatment (ART) in response to the United Nations joint declaration adopted by UNAIDS to reach all and treat all, has led to considerable reductions in HIV-related morbidity and mortality. Increasing the proportion of patients who achieve viral suppression during treatment has further reduced HIV transmission. However, HIV drug resistance (HIVDR) poses a threat to the long-term success of ART and the elimination of HIV/AIDS. Also, threaten to escalate the primary transmission of drug-resistant HIV strains to individuals who were ART naïve.
Objective: To assess the performance of the third-line ART scaling-up program in Tanzania.
Methods: The evaluation was conducted in the Tabora region. A purposeful sampling technique was used to select facilities under evaluation based on their levels of service delivery. Healthcare providers and data officers working at the CTC unit were involved. Files of clients who were on second-line ART regimens were reviewed. Self-administered questionaries were employed as the data collection tools. Centre for disease control and prevention, MMWR guideline was used as an assessment tool for Attributes evaluation. Data were entered into Microsoft Excel and analyzed.
Results: The majority of the attributes of the surveillance were performing well with an average of 85% to 95%. The timeliness of this surveillance system was poorly performing due to the long turnaround time of laboratory results like the Viral load (HVL) test and Genotyping antiretroviral resistance test (GART). Healthcare providers' knowledge levels of the third-line ART regime scaling-up were satisfactory.
Conclusion and recommendations: More staffs have to be trained and supervised to attain the goals of the program. Turnaround time should be followed as agreed, and availability of guidelines and SOPs.

INF14: Genotyping Antiretroviral Resistance Testing (GART) surveillance system evaluation – Dar es salaam, 2022

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Background: About 15.3 million people living with HIV/AIDS access life-saving antiretroviral drugs in sub-Saharan Africa. Currently, Tanzania implementing a rapid scale-up of 3rd line ART regimens by subjecting the clients to a GART system to have the decision on whether a regimen needs to be switched or not.
Objective: To evaluate the performance of the system to determine if meet its intended objectives.
Methods: A retrospective evaluation study was done at Temeke Regional Referral Hospital GART laboratory. The data from February 2021 to February 2022 was analyzed. The system attributes were evaluated as indicated in the Centers for Disease Control (CDC) guideline for Evaluating of Public Health Surveillance System. The data was collected using data extraction tools and were analyzed using Microsoft excel.
Results: Evaluation of the system indicated that it has a sensitivity of 100% and PVP of 73.7% as 278/377 (73.7%) clients had at least one or more drug resistance genes mutations. Among samples received in the GART laboratory; 377/592 (63.7%) were successful, 66/377 (17.5%) and 149/592 (25.2%) were

unsuccessful and not tested, respectively. 276/278 (99.3%) clients switched to another ARV combination, 2/278 (0.7%) switched to 3rd line ARV regimen, and 71/155 (45.8%) children were switched to subsequent ARVs regimens. Concordance of 95% was noted for results. Only 27% of the results were within turnaround time. 347 (58.6%), 215 (36.3%), 437 (73.8%) and 155 (26.2%) were females, males, adults, and children, respectively. Only 3/7 (43%) of staff were aware of the workflow of the system. **Conclusion and recommendation:** The system meets its objectives although quite complex, has good coverage, is stable, and is representative. The inclusion of detection of other genes like IN, gp41, and the gag is necessary, performing regular analytical error analysis, and recalculating the TAT will help Tanzania reach the new UNAIDS targets of 95% - 95% - 95% by 2025.

INF15: HIV Early Infant Diagnosis (HEID) uptake and outcomes among HIV exposed infants in Tanzania: a retrospective study using national CTC2 dataset

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Background: It is estimated that 30% of all children are born to HIV infected mothers in most of parts of Southern Africa and estimated that up to 50% of which will die before their second birthday and 80% will not live to their fifth birthday in the absence of anti-retroviral treatment (ART). Early diagnosis and effective treatment using ART prevents mortality and improve the quality of life among infected babies.
Objective: To assess the uptake of HEID in Tanzania between 2017-2019.
Methods: Data was extracted from the national CTC2 database from 2017 to 2019 and progress of uptake of HEID was assessed at scheduled tests namely, test 1 between birth and 42days (6weeks); test 2 at month 9 and test three at month 18. Survival and mortality were the outcome of interest and infant death defined as the deaths within eighteen months after birth.
Results: There was an increase in HEID uptake from 92.7% in 2017 to 96.4% in 2019. However, there was low uptake of test 2 and test 3 with the declining retention of mother-child pair from 85.6% at week 6 to 71.1% at month 18. However, 49% of all cases detected by month 18 resulted from only 70% of retained infants. An increase in nevirapine uptake associated with declining MTCT positivity was noted. **Conclusion:** There is improvement in HEID and declining HIV positivity, however, follow up need to be improved to ensure retention into care of all exposed infants.

INF16: Immunogenicity and efficacy of pneumococcal conjugate vaccine (prevenar13®) in preventing acquisition of carriage of pneumococcal vaccine serotypes in Tanzanian children with HIV/AIDS

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Background: In every year, up to one million children die due to pneumococcal disease. Children infected with Human Immunodeficiency Virus (HIV) are mostly affected, as they appear to have higher rates of pneumococcal carriage and invasive disease. Successful immunity is dependent on mounting a sufficient immune response to the vaccine.
Objectives: To determine the serum antibody response (≥4-fold and geometric mean concentration) to pneumococcal vaccine (PCV13) serotypes 3 months after the second vaccination. We also

determined the number and proportion of children carrying new (not present at baseline) vaccine serotypes of S.pneumoniae isolated from nasopharynx at 6 months post initial vaccination in recipients of Prevenar13® compared with those given Haemophilus influenzae-type b (Hib) vaccine (control).
Methods: The study was conducted at St Augustine's also known as Teule Hospital in Muheza, Tanga Tanzania. 225 HIV-infected children aged 1-14 years were enrolled from Jan 2013 to Nov 2013 and randomised to Prevenar13® or Hib vaccines each given at baseline and 2-3 months later. Nasopharyngeal and serum samples were collected at baseline and 4-6 months later. Serotyping was done by Quellung Reaction using Staten antisera. Serum antibodies were ELISA quantified.
Results: The study revealed a non-significant reduction in the acquisition of new vaccine serotypes of S. pneumoniae in the recipients of PCV13 by nearly a third compared to those who received Hib vaccine. The vaccine efficacy was 30.5% (95% confidence interval [CI] –6.4-54.6%, P = 0.100)]. The antibody response was not enough to induce a 4-fold rise in GMC in 7 of the 13 vaccine serotypes. When combining the effects of preventing the new acquisition and clearing existing vaccine-type carriage, the overall efficacy was 31.5% (95% CI 1.5-52.4%, P = 0.045). In the PCV13 group, the proportion of participants carrying vaccine serotype was significantly lower after 2 doses of PCV13 (30%; 32/107), compared with the baseline proportion (48%; 51/107).
Conclusion: The introduction of PCV13 targeting HIV-positive children in a setting similar to Tanzania is likely to be associated with an appreciable decrease in the acquisition and carriage of pneumococci, which is an important marker of the likely effect of the vaccine on pneumococcal disease. [The study is published: DOI: 10.3389/fimmu.2021.673392]

INF17: Phase 1 Human Immunodeficiency Virus (HIV) Vaccine trial to evaluate the safety and immunogenicity of HIV Subtype C DNA and MF59-adjuvanted subtype C envelope protein
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Background: The P5 Partnership is performing a suite of trials to evaluate the bivalent subtype C envelope protein vaccine in the context of different adjuvants and priming agents for human immunodeficiency virus type1 prevention.
Methods: In the HIV Vaccine Trials Network 111 trial, we compared the safety and immunogenicity of DNA prime followed by DNA/protein boost with DNA/protein co-administration injected intramuscularly via either needle/syringe or a needle-free injection device (Biojector). 132 healthy, HIV-1–uninfected adults were enrolled from Zambia, South Africa and Tanzania and were randomized to 1 of 6 arms: DNA prime, protein boost by needle/syringe; DNA and protein co-administration by needle/ syringe; placebo by needle/syringe; DNA prime, protein boost with DNA given by Biojector; DNA and protein co-administration with DNA and Placebo given by Biojector.
Results: All vaccinations were safe and well tolerated. DNA and protein co-administration was associated with increased HIV-1 V1/V2 antibody response rate, a known correlate of decreased HIV-1 infection risk. DNA administration by Biojector elicited significantly higher CD4+T-cell response rates to HIV envelope protein than administration by needle/syringe in the prime/boost regimen (85.7% vs 55.6%; P = .02), but not in the co-administration regimen (43.3% vs 48.3%; P = .61).
Conclusions: Both regimens are safe and may be promising for advancement into efficacy trials depending on whether cellular or humoral responses are desired.

INF18: Outcome of partner elicitation HIV testing services among key and vulnerable populations in underserved communities using mobile laboratory in Mbeya and Songwe regions, Tanzania

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Background: To achieve the UNAIDS target of 95-95-95 by 2030 effective approaches to HIV testing are required. The partner elicitation process has shown potential benefits in reaching and identifying new HIV positive clients, improving adherence to ART, and HIV prevention for the serodiscordant couple. Though growing evidence supports the feasibility and effectiveness of partner elicitation in identifying new HIV clients, there is limited data on the uptake of partner elicitation in community-based HIV Testing Services (HTS).
Objective: To assess outcome of partner elicitation process among KVP.
Methods: From October 2019 to September 2021 the mobile outreach team visited identified rural communities offering standardized HIV prevention services using HIV testing as the entry point. Clients diagnosed to be HIV positive were privately referred to nurse counselors for index-partner elicitation process and upon giving their consensus for "partner tracing," the counsellors collected contact information for each elicited partner from the index client. The client sexual partners were contacted by the nurse counselor for HIV counseling and encouraged to undergo HIV testing.
Results: A total of 461 HIV positive index clients were approached for the elicitation process; 138 sexual partners were successfully referred to the mobile laboratory for HIV testing, of which 73 (53%) were male partners, and 115(83.3%) were married. Among the referred clients 76(55.1%) tested HIV positive and 75 (98%) were successfully enrolled in CTC. The positivity rate was higher among Male partners 41(56.2%), and divorced clients 10 (66.7%) compared to their counterparts however, the difference was statistically insignificant. HIV negative partners of index clients were linked to the nearby clinics for pre-exposure prophylaxis.
Conclusion: HIV partner elicitation process was successfully implemented in underserved communities among high-risk population; the result shows that the process is highly effective in early identification of clients with HIV and linkage to care that facilitate risk reduction among high-risk uninfected partners.

INF19: Kaposi's sarcoma-associated herpesvirus shedding in saliva and cervical secretions in Tanzanian women

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Background: In endemic areas, Kaposi's sarcoma-associated herpesvirus (KSHV) transmission occurs to a significant degree via saliva, typically during childhood. Factors leading to KSHV viral reactivation and salivary shedding remain poorly understood. Preliminary data suggest that Schistosoma mansoni infection, which has been associated with impairment of control of other viruses, may contribute to KSHV reactivation but have been limited by a focus on seroprevalence or small sample size.
Objective: To determine the relationship between active S. mansoni or S. haematobium infection and KSHV shedding.
Methods: We quantified KSHV DNA in stored saliva and cervical swab samples from two different cohorts of women living in areas of Tanzania with endemic S. mansoni or S. haematobium by real-time polymerase chain reaction. Chi-squared and Fisher's Exact tests were used to determine differences in clinical and demographic factors between those who were and were not shedding KSHV.
Results: Among the 99 women from the S. mansoni area, 6 (6.1%) had detectable KSHV in saliva. There was no difference in frequency of KSHV salivary shedding between the 39 women with S. mansoni infection and the 60 women without. Women with KSHV salivary shedding more frequently reported infertility than those not shedding KSHV (80% versus 19.5%, p=0.009). Among the 43 women from the S. haematobium area, 7 (15.9%) had detectable KSHV in saliva. There was no difference in frequency of KSHV salivary shedding between the 18 women with S. haematobium infection and the 25 without. No woman had KSHV detected in her cervical sample. In a sensitivity analysis, 80 of 82 women (98%) were KSHV IgG seropositive.
Conclusion: In this population with high KSHV seroprevalence, we provide the first report that S. haematobium infection was not associated with KSHV salivary shedding and provide additional evidence for lack of increased shedding in S. mansoni infection. Interestingly, KSHV salivary shedding was associated with infertility, which is a known effect of another herpesvirus, HHV-6. Our results contribute to knowledge about the epidemiology and transmission of KSHV infection in an East African population.

INF20: Dissecting the influence of HIV on HPV infection and cervical cancer
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Background: Cervical cancer - caused by High-Risk Human Papilloma Virus (HR-HPV) infections - is the most common cancer affecting women in East Africa. According to the WHO, women living with HIV are 6 times more likely to develop cervical cancer when compared to HIV- women. The HIV-HPV (2H) project was set up in 2013 in Mbeya to determine underlying factors associated with

this increased risk for cervical cancer among HIV+ women. Having screened > 2000 women and followed-up more than 500 women for up to 7 years, makes the 2H study the largest longitudinal project addressing cervical cancer in Africa.
Objectives: To identify factors associated with increased risk for cervical cancer among women living with HIV.
Methods: The 2H study enrolled 804 HIV+ and HIV- women, with and without cervical lesions. Biological specimens were collected: Biopsies and pap smears for cytohistologic diagnosis, cervical cytobrushes for HPV genotyping and viral load quantification, and blood for HPV-specific immunology.
Results: Overall, HR-HPV prevalence was 57% (241/421); 71% (165/234) in HIV+ vs 41% (76/187) in HIV-, p < 0.0001. Regardless of HIV infection, HPV genotypes 16, 18 and 45 accounted for the vast majority of cervical cancer cases. HIV+ women were diagnosed with cervical cancer 11 years younger than HIV- women (median years: 56 vs 45, p < 0.0001). Half (50%) of women diagnosed with cervical cancer died within 2 years after diagnosis, regardless of HIV status. Furthermore, we analysed HPV-oncoprotein-specific T cell responses in 373 women. HIV infection, especially with low CD4 counts and progressed lesion (CC or HSIL) were linked to depletion of HPV-oncoprotein-specific T cell responses.
Conclusion and recommendations: HIV likely contribute to increased HPV persistence and the accelerated cancerogenesis in women living with HIV. Optimized molecular diagnostic algorithms tailored to women living with HIV to detect type-specific persistence could help to pre-select women at high risk of cancer development for further diagnostics and therapeutic intervention.

INF21: Effect of digital adherence tools on adherence to antiretroviral treatment among adults living with HIV in Kilimanjaro, Tanzania: a randomized controlled trial
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Background: Adherence to antiretroviral treatment (ART) remains a major challenge for people living with HIV (PLHIV). While adaption of Digital Adherence Tools (DAT) has grown globally.
Objective: To investigate whether DATs are effective and acceptable to improve adherence among PLHIV in Kilimanjaro, Tanzania.
Methods: We conducted a three-armed randomized controlled trial (REMIND) with participants assigned in 1:1:1 ratio: (1) SMS text messages reminder (SMS), (2) real-time medication monitoring (RTMM) device and (3) standard of care. Adults subjectively judged by nurses as non-adherent aged between 18 to 65 years and on ART for at least 6 months were enrolled from two health facilities in Kilimanjaro region. Each study visit, pharmacy refill counts and self -report adherence data were recorded. In addition, participants in SMS and RTMM arms received tailored feedback on medication adherence based on data from SMS or RTMM. The primary outcome was to compare mean adherence over 48 weeks between arms. Secondary outcomes were to examine the acceptability and technical and psychosocial challenges of DATs using mixed methods approaches which were assessed in exit-interviews after study participation.

Results: Of the 265 participants screened, 249 were randomized: 83 in RTMM arm, 83 in SMS arm and 83 in standard care arm. Over 48 weeks, the mean adherence was: 89.6% in the SMS arm, 90.6% in the RTMM-arm and 87.9% in the control arm (p=??). For pharmacy refill, the adherence was above 95% in each arm and for self-report it was above 96% in each arm both not statistically significant between arms. To assess acceptability, 143 were reached for interviews: 68 in SMS and 75 in RTMM. Majority (98%) were highly satisfied with DAT. Few described technical and psychosocial challenges including poor network, power failures and potential stigma.
Conclusion: Overall, DATs did not show a positive effect on ART adherence even though it was highly acceptable. Several factors may potentially have hampered the results and should be further investigated including the fidelity of the intervention, the SMS contents and number of SMS, carrying the devices and the network availability.

INF22: Impacts of HIV1 and HIV2 and HIV-1+2 dual infections on occurrence of HIV opportunistic among HIV patients on Ant-retro therapy (ART) in Njombe and Dar es salaam regions, Tanzania: a retrospective cross-sectional study

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Background: HIV-1 and HIV-2 is globally known HIV types that differ by 55% in genetic makeup which results to difference treatment clinical outcomes. Studies show spreads of HIV-2 from endemic area to other area. This study was aimed to determine the association of occurrence of OIs among the PLHIV infected with either HIV1, HIV2 or HIV-1+2 dual infections in Njombe and Dar es salaam Regions, Tanzania.
Objectives: To determine the association between the HIV subtypes and the occurrence of HIV classical opportunistic infections among the PLHIVs with HIV-1, HIV-2 and HIV-1+2 dual infection in Dar es Salaam and Njombe regions of Tanzania.
Methods: A retrospective cross-sectional study was conducted from January 2020 to December 2021 at eight Care and Treatment Centers in Njombe and Dar es salaam Tanzania. A total of 300 participants on ART treatments were randomly selected from patients' files. Data collected were entered in SPSS version 26.0 for analysis and interpretation. Percentages and Chi-square were used to interpret data. Logistic regression was used to determine association, Odds ratios (OR), 95% confidence intervals (CIs), and p-values of ≤0.001 were used measure statistically significant of the variable. Ethical clearance was sought from KNCHREC. All participants were provided with informed consent.
Results: The mean age were 35.0 (SD ± ± 0.24) year. There were more female with HIV 1 110 (53.1%) compared to HIV-2 25 (56.8) and HIV1 1+2 dual infection. Tuberculosis, PCP and Oesophageal candidiasis were common OIs to PLHIV with HIV-1+2 (p<0.001, 0.02, 0.02). PLHIV with HIV-2 and HIV1+2 had two times higher risks to OIs. [(RR: 1.69, 95% CI, 1.39 - 2.07), P<0.001, (RR: 1.78: 95%CI, 1.51-2.10 P<0.001. HIV 1+2 had high relative risks to OIs when adjusted with age, sex, CD4 and VRL (RR: 1.69, 95% CI, 1.39 - 2.07).
Conclusions: The study show high risks of occurrence to PLHIV with HIV-2 and HIV1+2 dual infection therefore the proper management for these subtypes should be encouraged to reduce their impacts.

INF23: Co-receptor tropism and entry inhibitor sensitivity of multiple HIV-1 non-B subtypes that co-circulate in Tanzania

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Background: The effectiveness of HIV-1 entry inhibitors like Maraviroc depends on viral co-receptor tropism and thereby tropism determination is clinically important. However, entry inhibitor sensitivity and co-receptor tropism of HIV-1 non-B subtypes is largely unexplored.
Objective: To investigate co-receptor tropism and determine entry inhibitor sensitivity of multiple non-B subtypes that co-circulates in Tanzania.
Methods: We recruited 52 newly diagnosed, treatment-naïve, HIV-1infected patients from Dar es salaam, Tanzania. The HIV-1 envelope genes were amplified from plasma viral RNA by nested RT-PCR, cloned into a plasmid, and sequenced. Patient-derived pseudo viruses were exposed to U87.CD4+ cell line expressing either CCR5 or CXCR4 co-receptor to assess their phenotypic co-receptor tropism. Genotypic tropisms were analyzed based on the sequence data encoding the variable region 3. We went further to determine their sensitivity to entry inhibitors in both TZM-bl and U87.CD4.CCR5 cells.
Results: Sequence analysis of 93 infectious envelope clones isolated from the 52 recruited patients revealed the co-circulation of subtypes A1, C, D, and inter-subtype recombinant forms (isRFs). Phenotypic tropism assays revealed that 75 (80.6 %) and 5 (5.4%) envelope clones could establish infection toward U87.CD4 cells expressing CCR5 and CXCR4, respectively; whereas the remaining 13 (14.0%) clones could infect both cells. Genotypic analyses by widely used algorithms showed that almost all phenotypic X4-tropic clones and only 15 of 75 phenotypic R5-tropic clones were concordantly predicted. However, 60 (80%) phenotypic R5-tropic clones were discordantly predicted. Majority of clones were sensitive to the entry inhibitors. Nonetheless, our results reveal the presence of Maraviroc resistance variants with cross-resistance to other entry inhibitors in this cohort.
Conclusion: Our results reveal a highly diverse nature of HIV-1 envelopes in Tanzania, with some limitation of genotypic prediction algorithms for co-receptor tropism among co-circulating non-B HIV-1 subtypes. Also, identification of entry inhibitor resistant clones among co-circulating CCR5 using variants in Tanzania.

INF24: A Phase 2b study to evaluate the safety and efficacy of vrc01 broadly neutralizing monoclonal antibody in reducing acquisition of HIV-1 infection in women in Sub-Saharan Africa

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Background: HIV Vaccine Trials Network 703/HIV Prevention Trials Network 081 is a phase 2b randomized, double-blind, placebo-controlled trial to assess the safety and efficacy of passively infused monoclonal antibody VRC01 in preventing HIV acquisition in heterosexual women between the ages of 18 and 50 years at risk of HIV. Participants were enrolled at 20 sites in Botswana, Kenya, Malawi, Mozambique, South Africa, Tanzania, and Zimbabwe.
Objective: It is one of the 2 Antibody Mediated Prevention efficacy trials, with HIV Vaccine Trials Network 704/HIV Prevention Trials Network 085, evaluating VRC01 for HIV prevention.

Methods: Intense community engagement was used to optimize participant recruitment and retention. Participants were randomly assigned to receive intravenous VRC01 10 mg/kg, VRC01 30 mg/kg, or placebo in a 1:1:1 ratio. Infusions were given every 8 weeks with a total of 10 infusions and 104 weeks of follow-up after the first infusion.
Results: Between May 2016 and September 2018, 1924, women from sub-Saharan Africa were enrolled. The median age was 26 years (interquartile range: 22-30), and 98.9% were Black. Sexually transmitted infection prevalence at enrollment included chlamydia (16.9%), trichomonas (7.2%), gonorrhea (5.7%), and syphilis (2.2%). External condoms (83.2%) and injectable contraceptives (61.1%) were the methods of contraception most frequently used by participants. In total, through April 3, 2020, 38,490 clinic visits were completed with a retention rate of 96% and 16,807 infusions administered with an adherence rate of 98%.
Conclusions: This proof-of-concept, large-scale monoclonal antibody study demonstrates the feasibility of conducting complex trials involving intravenous infusions in high incidence populations in sub-Saharan Africa.

INF25: Prevalence of and risk factors associated with HIV, Herpes Simplex Virus-type 2, Chlamydia trachomatis and neisseria gonorrhoeae infections among 18–24-year-old students attending higher learning institutions in Mbeya-Tanzania
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Background: Sexually transmitted infections (STIs) are common among young-people in low- and middle-income countries and are associated with negative reproductive and pregnancy outcomes. Most studies have assessed HIV among adolescents and young adults with limited information on occurrence of other STIs.
Objective: To describe prevalence and risk factors associated with HSV-2, Chlamydia trachomatis (CT), Neisseria gonorrhoeae (NG), Syphilis and HIV infection among young-adults attending Higher Learning Institutions (HLIs) in Mbeya-Tanzania.
Methods: We conducted a cross-sectional study among students aged 18-24y attending HLIs in Mbeya-Tanzania, randomly selected using a random number. Participants were tested for HSV-2, CT, NG, Syphilis and HIV infection. We used a self-administered questionnaire to collect information on sexual activity and risk factors to the tested STIs.
Results: We enrolled 504students from 5HLIs, with mean age of 21.5y (SD 1.7). 17% of the students had at least one STI; prevalence was higher among females than males (21.1% versus 14.1%). CT (11%) and HSV-2 (6.1%) were the most common STIs, while NG (1.1%) and HIV (0.7%) infection had the least occurrence. None of the participants was diagnosed with Syphilis. In univariate analysis, predictors for STIs were Sex, inconsistent condom use in the past 4weeks, report of oral sex, sexual orientation (bisexual/homosexual) and having a sexual partner with an age-difference of at least 5y (either older or younger); while in the multivariate analysis, Sex, inconsistent condom use in the past 4weeks, and sexual orientation (bisexual/homosexual) remained significant.

Conclusion: Chlamydia and HSV-2 which are commonly asymptomatic are of concern among young-adults attending HLIs. IEC campaigns targeting young-adults, especially those at HLIs, need to focus on exposure-risk minimization. Funding institutions that invested heavily on HIV prevention should consider giving similar recognition to other STIs for a streamlined outcome.

INF26: "By only considering the end product it means that our participation has always been in vain": Defining benefits in HIV vaccine trials in Tanzania

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Background: Defining benefits in human health research continues to be debatable especially when conducted in resource-limited settings. It is even more worrying for HIV vaccine trials which for over 30 years of research, the vaccine remains elusive.
Objective: To explore stakeholders' perspectives of what constitutes benefits in HIV vaccine trials conducted in Tanzania.
Methods: A qualitative case study design was used. The study population was purposely sampled from the Dar es Salaam and Mbeya region and included 8 institutional review board (IRB) members, 6 principal/co-principal investigators of HIV vaccine trials and 15 community advisory boards (CAB) members, totalling 29 participants. IRB members and investigators participated in in-depth interviews whereas CAB members participated in focus group discussions. The data was analyzed thematically with the aid of MAXQDA version 20.4.0 software.
Results: After analysis, our findings indicate that although HIV vaccines are desirable benefits, still there is an increasing desire for equally important benefits such as capacity building not only at the individual level but also at the community, institutional and regulatory levels. Similarly, to non-capacity building benefits such as strengthened collaborations, ancillary care and employment opportunities that emanate from HIV vaccine trials.
Conclusion: This study provides empirical evidence to stakeholders including policymakers and research regulatory institutions to extend the benefit consideration beyond actual research products. Doing so would lessen the notion of exploitation for clinical trials with no immediate benefits.

INF27: Third-line art regimen scaling-up program surveillance system evaluation

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Background: The global campaign of scaling-up of antiretroviral treatment (ART) in response to the United Nations joint declaration adopted by UNAIDS to reach all and treat all, has led to considerable reductions in HIV-related morbidity and mortality. Increasing the proportion of patients who achieve viral suppression during treatment has further reduced HIV transmission. However, HIV drug resistance (HIVDR) poses a threat to the long-term success of ART and the elimination of HIV/AIDS.

Also, threaten to escalate the primary transmission of drug-resistant HIV strains to individuals who were ART naïve.
Objective: To assess the performance of the third-line ART scaling-up program in Tanzania.
Methodology: The evaluation was conducted in the Tabora region. A purposeful sampling technique was used to select facilities under evaluation based on their levels of service delivery. Healthcare providers and data officers working at the CTC unit were involved. Files of clients who were on second-line ART regimens were reviewed. Self-administered questionaries were employed as the data collection tools. Centre for disease control and prevention, MMWR guideline was used as an assessment tool for Attributes evaluation. Data were entered into Microsoft Excel and analyzed.
Results: The majority of the attributes of the surveillance were performing well with an average of 85% to 95%. The timeliness of this surveillance system was poorly performing due to the long turnaround time of laboratory results like the Viral load (HVL) test and Genotyping antiretroviral resistance test (GART). Healthcare providers' knowledge levels of the third-line ART regime scaling-up were satisfactory.
Conclusion and recommendations: More staffs have to be trained and supervised to attain the goals of the program. Turnaround time should be followed as agreed, and availability of guidelines and SOPs.

INF28: Mortality trend and associated factors among HIV clients on antiretroviral therapy in Tanzania from 2018-2020

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Background: Studies on Antiretroviral therapy programs in Africa have shown a significant reduction of mortality among HIV clients. Mortality trend among HIV clients on Antiretroviral therapy (ART) in Tanzania from 2018 to 2020 and factors associated with it are poorly described.
Objectives: To assess mortality trends and to identify predictors of mortality in HIV-infected patients on ART in 26 regions in Tanzania mainland Methods: Observational analysis of data from HIV-positive patients obtaining care and treatment from health facilities in Tanzania, Data were reviewed for mortality between January 2018 and December 2020. The proportional death by age, sex, ART program year, marital status, clinical stage, and Regional were obtained using cross-tabulation and Pearson's chi-squared for significance. Logistic regression was used to determine the predictors of mortality at bivariate and multivariate levels, respectively.
Results: A total 29982 study participants were randomly selected from each program year making a total of 89946 participants from 2018-2020. The annual specific mortality was 5.9%, 4.3%, and 3.14% in 2018, 2019, and 2020, respectively. Mortality was significantly associated with malnutrition AOR= 2.1 (95% CI 1.4 – 3.1), Being a male AOR=2.0 (95% CI: 1.6-3.9) participants with active TB or history of TB treatment AOR= 1.7 (95% CI: 1.4-6.6), WHO clinical stage (3) AOR=2.2 (1.5-3.3), WHO clinical stage (4) AOR=7.3 (3.9-13.7) and CD4 count less than 200cells/mil AOR=1.7(95% CI: 1.31-2.3).
Conclusion: Mortality trend in Tanzania was seen to decrease with time from 2018 to 2020. Most deaths occurred among male patients, patients with advanced diseases (WHO stage 3 and 4), TB coinfection, CD4 count <200 cells/µl, and those with malnutrition. This mortality would be further

reduced by improving TB screening and treatment, nutritional support, and promoting early diagnosis and treatment of HIV.

INF29: The burden of ESBL E. coli and K. pneumoniae carriage among neonates and their surroundings admitted at referral hospital in Northeast Tanzania

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Background: Infections are a major driver of broad-spectrum antibiotic use and therefore contributes to the emerging global threat of antimicrobial resistance that pose a threat to human and animal health. Despite being highly preventable, infections continue to be a major cause of death for pregnant women and Newborn babies.
Objective: To assess the burden of Extended Spectrum Beta-lactamase (ESBL) E. coli and K. pneumoniae carriage among neonates and their surroundings admitted at referral hospital in Northeast Tanzania.
Methods: The burden of ESBL E. coli and K. pneumoniae at neonatal ward was measured by screening of neonates' rectum, maternal hands, healthcare workers and neonatal cots in referral hospitals. A total of 262 rectal swabs were collected from neonates, 77 maternal hands swabs, 118 neonatal cots and 45 health care workers hand swabs. The specimen was then transported at 4°C to the laboratory for routine bacterial culture, biochemical identification and antimicrobial susceptibility testing.
Results: A total of 262 rectal swabs from neonates were screened for ESBL E. coli and K. pneumoniae, 50% infants carried ESBL E. coli and K. pneumoniae, 5.1% and 22 % maternal hands and neonatal cots respectively were found contaminated with ESBL E. coli and K. pneumoniae. High levels of resistance in all samples to baseline antibiotics, Ampicillin and Gentamycin was recorded.
Conclusion: Our findings have indicated a high burden of resistance bacteria carriage among neonates, maternal hands, and neonatal cots as well as high resistance to baseline antibiotics, Ampicillin and Gentamycin. To ensure effectiveness of infection control measures and prevent transmission of resistant bacteria, active screening on admission to a specific ward can effectively limit and prevent the spread of resistant bacteria as well as design and establishment of microbiological methods to detect resistant bacteria can be relevant in selection of empiric antimicrobial chemotherapy covering the colonizing pathogen.

INF30: Patterns of malnutrition in pediatric tuberculosis: results from the "RAPAED STUDY"

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Background: Childhood tuberculosis and malnutrition are major health challenges in most underdeveloped countries. Under nutrition is not only a risk factor for progression of latent TB infection to active disease but also intensifies the risk of mortality.
Objective: To evaluate the patterns of malnutrition with time in enrolled children with presumptive TB.
Methods: RaPaed-TB is a multi-diagnostic study conducted in Tanzania, South Africa, Malawi, Mozambique, and India. Children < 15 years with presumptive TB were enrolled into the study since

January 2019 and tested for TB by Gene Xpert and culture. Anthropometric measurements were taken in all attended visits and Z-score was calculated at the end of study visits. All children with malnutrition were linked to the national program of treating malnutrition.
Results: As of June 2022, 974 children were enrolled. Overall, 60.98% (547/897) were non-malnourished, 18.51% (166/897) had mild malnutrition, 11.04% (99/897) moderate malnutrition and 9.48% (85/897) severe malnutrition at baseline. When stratified by disease state; among microbiologically confirmed TB cases, 60% had no malnutrition, 14% mild, 15% moderate and 9% severe malnutrition. For unlikely TB, 64% had no malnutrition, 23.5% mild, 5.9% moderate and 6.4% severe malnutrition. There was no substantial difference in the pattern of malnutrition between confirmed and unconfirmed disease groups. After 6 months of follow-up, 79% of confirmed TB cases had no malnutrition which includes children without malnutrition at baseline and those who improved after TB and Malnutrition treatment. Nutritional status was seen to improve with TB treatment despite some having malnutrition until the end of study.
Conclusion: Malnutrition and TB are closely linked, highlighting the need for improved integration of nutritional services. Nutritional supplementation represents a crucial approach for fast recovery in tuberculosis patients and proves to be an effective measure to control tuberculosis and help reduce mortality among children with TB and acute malnutrition.

INF31: The burden of ESBL E. coli and K. pneumoniae carriage among neonates and their surroundings admitted at referral hospital in Northeast Tanzania

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Background: Infections are a major driver of broad-spectrum antibiotic use and therefore contributes to the emerging global threat of antimicrobial resistance that pose a threat to human and animal health. Despite being highly preventable, infections continue to be a major cause of death for pregnant women and new-born babies.
Objective: To assess hospital transmission of ESBL E. coli and K. pneumoniae.
Methods: Within hospital transmission of ESBL E. coli and K. pneumoniae was measured by screening of neonates, mothers, healthcare workers and neonatal cots in referral hospitals. A total of 262 rectal swabs were collected from neonates. The specimen was then transported at 4°C to the laboratory for routine bacterial culture, biochemical identification, and antimicrobial susceptibility testing.
Results: 50% infants carried ESBL bacteria. ESBL bacteria infrequently found in maternal hands swabs (4/77), Cots often contaminated with ESBL bacteria (26/118). High levels of resistance in all samples to baseline antibiotics, Ampicillin and Gentamycin.
Conclusion: Our findings have shown a considerable burden of resistance bacteria carriage among neonates, maternal hands, cots. To ensure effectiveness of infection control measures to prevent transmission of resistant bacteria by active screening on admission to a specific ward can effectively limit and prevent the spread of resistant bacteria. Design and establish microbiological methods to detect resistant bacteria can be relevant in selection of empiric antimicrobial chemotherapy covering the colonizing pathogen.

INF32: Spectrum and antimicrobial susceptibility patterns of pathogen causing neonatal sepsis at Regional Referral Hospital, Dar es Salaam Tanzania

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Background: The diagnosis and treatment of neonatal sepsis in resource-limited settings rely on clinical presentation due to limited laboratory capacity to perform confirmatory tests. The World Health Organization recommends ampicillin, cloxacillin, and gentamycin as the first-line antibiotics for neonatal sepsis. In addition, a combination of ampicillin with gentamicin or ceftriaxone has been advocated. However, the etiology and antimicrobial susceptibility patterns vary geographically.
Objective: To determine the bacterial spectrum and antimicrobial susceptibility patterns at Mwananyamala Regional Referral Hospital.
Methods: A hospital-based cross-sectional study design was conducted by recruiting neonates with at least two signs of possible sepsis. We collected blood samples for culture and isolates identified using the conventional biochemical tests. In addition, antimicrobial susceptibility tests were done using the Kirby-Bauer disc diffusion method.
Results: We recruited a total of 286 neonates and performed blood cultures. Of 286 blood cultures, 198 (69.2%) were culture positive, with eight types of microorganisms isolated. Gram-positive bacteria counted in 83.3% of all isolates. The five most prevalent isolated organisms included Coagulase-negative staphylococcus (32.3%), Staphylococcus aureus (26.8%), Streptococcus agalactiae (18.7%), Escherichia coli (7.6%) and Enterococcus (5.6%). More than 60% antibiotic resistance was observed in ampicillin, erythromycin, ceftriaxone, penicillin, and augmentin. Resistance to gentamicin and oxacillin ranged from 35% to 100%.
Conclusion: Gram-positive bacteria were the leading cause of neonatal sepsis. In addition, pathogens causing neonatal sepsis were highly resistant to first-line antibiotics used to treat neonatal sepsis.

INF33: Reduced efficacy of LLINs in an area with pyrethroid-resistant populations of Anopheles gambiae s.s. and funestus s.s. in North-eastern Tanzania: a longitudinal meta-analysis of experimental hut studies.

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Background: The extent to which insecticide resistance is affecting malaria vector insecticidal control in the community and home is not fully understood.
Objective: To assess the implications of insecticide resistance for entomological efficacy of LLINs against wild free-flying field Anopheles gambiae s.l. and Anopheles funestus s.l in experimental hut trials in NE Tanzania before and after the evolution and spread of pyrethroid-resistance.
Methods: Evaluations of LLIN efficacy were conducted in EHT following World Health Organization (WHO) guidelines in a series of ten trials commissioned by WHO between 2006 and 2017, the period

before and after resistance development. WHO standard bioassay methods were used to detect resistance while Polymerase Chain Reaction (PCR) based molecular diagnostics were used to identify mosquitoes to species and detect resistance alleles.
Results: An. gambiae s.l. and An. funestus s.l mosquitoes from the study area were fully susceptible to pyrethroids until 2010 when they began to show resistance. The VGSC L1014S point mutation kdr was detected in An. gambiae s.s. at the allelic frequency of 47%. Synergist tests test with PBO restored efficacy suggesting involvement of metabolic mechanisms in addition to kdr. Meta-analysis of the 10 trials showed that mortality of susceptible An. gambiae s.l. was 8.4 and 4.4-fold higher on zero-times ($z = 5.5$, $p = 0.001$) and 20-times washed LLINs ($z = 6.7$, $p = 0.001$) than against resistant An gambiae s.l. The mortality of unwashed and washed LLINs against susceptible An funestus s.l was 7.7 ($z = 2.1$, $p = 0.037$) and 5.0 ($z = 3.3$, $p = 0.001$) fold higher than against resistant An funestus s.l..
Conclusions: Reduced mortality after the selection of pyrethroid resistance indicates that resistance may undermine the community effectiveness of pyrethroid LLINs.

INF34: Insecticide resistance monitoring in mainland Tanzania: status and trends of resistance in selected districts.
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Background: The development of insecticide resistance has become a serious threat to the continued effectiveness of insecticide-based malaria vector control measures. This article presents and discuss the evolution, trend and dynamics of insecticide resistance and its underlining mechanisms in Tanzania as a result of the analysis of the output of annual resistance surveys conducted across mainland Tanzania from 2004 to 2020 on Anopheles gambiae s.l populations.
Methods: The World Health Organization (WHO) standard protocols were used to detect insecticide susceptibility status of the wild female Anopheles gambiae s.l mosquitoes reared from larvae collected in the sentinel districts. Piperonyl butoxide (PBO) synergist tests were carried out in sites where mosquitoes were found to be resistant to pyrethroids. To estimate insecticide resistance trends from 2004 to 2020, aggregated mosquito mortalities from each site and time were performed using regression analysis of mortality versus the Julian dates of bioassays.
Results: Percentage number of sites with resistance increased from 0% in 2004 to more than 80% in the 2020. This shows that resistance has been spreading geographically. Results indicate a strong negative association (p value<0.0001) between pyrethroids susceptibility status and survey year. There was a slight decreasing trend of An. gambiae s.l. susceptibility to bendiocarb insecticide over time, however this was not statistically significant ($p = 0.8413$). Anopheles gambiae s.l. exhibited high level of susceptibility to the organophosphate insecticides in sites tested over time.
Conclusions: The, An. gambiae s.l., a major malaria vector in Tanzania is resistant to pyrethroids across the country with resistance increasing in prevalence, intensity and has been spreading geographically from 2011 to 2020. This calls for urgent actions for efficient novel malaria vector control tools to sustain the gains obtained in malaria control. Strengthening the insecticide resistance monitoring is important for evidence generation for effective malaria vector control decision making.

INF35: Evaluation of the wash resistance of two new pyrethroid plus chlorfenapyr mixture bed nets as a good predictor of the longevity of insecticidal activity under field conditions

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Background: Recently there have been confirmed reports of reduced efficacy of Standard LN in places where the malaria vector mosquito Anopheles gambiae sensu lato (s.l.) has become strongly resistant to pyrethroids (WHO 2015). If LN are to remain practical for malaria transmission control, it is essential that new insecticides are identified and developed to address the growing problem of resistance.
Objective: To evaluate the wash resistance of two new pyrethroid plus chlorfenapyr mixture bed nets as a good predictor of the longevity of insecticidal activity under field conditions.
Methods: WHO recommended cone bioassays was performed on Candidate I, Candidate II, Interceptor G2 LN and on Interceptor LN netting taken from the sides and roof of the nets over 20 washes. The bioassays were carried out using laboratory reared pyrethroid susceptible An. gambiae Kisumu strain by exposing at 0 up to 20 washes. Ten replicate batches of 5 mosquitoes per batch were tested at each wash interval on the 5 sectors of each net. Mosquito exposure was for 3 min and mortality was scored 24 hrs, 42 hrs and 72 hrs later.
Results: The % mortality of mosquitoes induced by 3-minute exposure to Candidate 1 did not exceed 80%, the highest value at 72 hrs post exposure was 80% at the second wash. While the highest 72 hours mortality for Candidate II was 78% at the first wash, after twenty washes its mortality was 42%. The highest 72 hours mortality recorded by the interceptor G2 was 73% and, its mortality after twenty washes was 42%. Interceptor LN against An. gambiae Kisumu strain was 100% when unwashed and 83% after 20 washes.
Conclusion: The wash resistance of the Candidates tested may serve as rapid tools for predicting long-lasting efficacy under field conditions.

INF36: Life-history attributes of An. gambiae s. l. and An. funestus exposed to new generation nets: an experimental hut study

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Background: Anophelines are developing resistance to all classes of insecticides used for mosquito control. The emergence and rapid spread of pyrethroid resistance in malaria vectors populations is a threat to the sustainability of both IRS and LLINs programmes in many African countries. There is a need for new tools and better ways to assess the available and new tools. In order to evaluate the vector control tools, understanding the behavior of malaria mosquito vector is important.
Objective: To determine the life-history attributes of An. gambiae s. l. and An. funestus exposed to new generation nets.

Methods: This was an experimental hut trial conducted as per World health Organization (WHO) guidelines for the duration of six weeks in Mwagagala, Misungwi. Nets tested in Experimental huts were interceptor G1 (IG1) (unwashed), interceptor G2 (IG2) (unwashed), Royal guard (RG) (washed 20 times), Royal guard (unwashed), interceptor G2 (washed 20 times) and untreated net which was used as the control. Mosquitoes were collected inside the huts using hand-held aspirators. All malaria vectors collected from each hut and net source were assessed on their physiological status and recorded. Half (number) of fed, gravid and semi-gravid were monitored individually and allowed to lay eggs, which were followed-up until the F1emerged. The numbers of eggs, larvae, pupa and adult emerged were counted. All mosquitoes which were followed (F0) were monitored until they die. **Results**: A total of 255 malaria vectors were followed for life history traits, among them 198 were An. gambiae s. l. and 57 were An. funestus. The number of An. gambiae s. l. that laid eggs were 20.7% (n=41) in the IG2 washed 20 times while untreated control nets was 19.7% (n=39). The average number of eggs laid, pupae and adults emerged per female An. gambiae s. l. were 37.6, 11.4 and 11.3, respectively in IG2 washed 20 times. In the Royal guard unwashed nets, the average number of larvae hatched were 2.8 while for the pupae and adult emerged per female An. gambiae s. l. were 2.4 each. No An. funestus laid eggs in Royal guard unwashed and washed 20 times. The findings of the present study have shown the variations in longevity between malaria vectors post-exposure to different net types. **Conclusion:** The present study has revealed the insecticidal effect on the life history attributes of An. gambiae s. l. and An. funestus exposed to new generation nets in experimental huts. Coupled with ongoing behavioral work nested in this study, it will provide important information to identify entomological correlates that can be used to predict epidemiological impact.

INF37: Epidemiological profile of malaria infection and malaria vectors densities in north-eastern Tanzania: outcomes from two cross-sectional studies

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Background: Gametocytes of Plasmodium are solely responsible for parasite transmission from the mammalian host to the mosquito when present as both sexes. They are a logical target for transmission-blocking antimalarial interventions, which aim to break the cycle of reinfection and reduce the prevalence of malaria cases.
Objective: To determine gametocytes sex and their distribution among mosquitoes and human hosts in different sites, altitudes and among different age groups.
Methods: Malaria blood slides (BS) were performed in children aged 6 months to 14 years during Cross Section studies (July 2020-Jan 2021). Gametocytes were scored under a microscope using x100 magnification.
Results: This study shows a female biased gametocyte sex ratio. It suggests that male gametocytes are sensitive to antimalarials while females' ones are less sensitive. In general female gamatocytes were higher than male gametocytes in all altitudes, age group and study sites. Moreover, gametocytes density was higher in low altitude than higher altitudes. 65% of all gametocytes were found among male human host while 35% were found among female human hosts.
Conclusion and recommendations: This study is a major step towards identification of male-targeted compounds which can be prioritized for further development of key transmission-blocking molecules to be used in malaria control strategies. We recommend that gametocytes clearance efforts should focus on male human being who host two third of all gametocytes.

INF38: Laboratory and semi-field evaluation of the efficacy of Bacillus thuringiensis var. israelensis (Bactivec®) and Bacillus sphaericus (Griselesf®) for control of mosquito vectors in North-eastern Tanzania

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Background: Bacillus thuringiensis var. israelensis (Bti) and Bacillus sphaericus (Bs) have been used extensively for mosquito control. However, their efficacy varies due to factors related to target mosquitoes, larval habitat conditions and larvicide properties.
Objective: To evaluate efficacy of Bti (Bactivec®) and Bs (Griselesf®) for control of mosquito larvae under laboratory and semi-field conditions.
Methods: Laboratory bioassays were conducted with five to six different concentrations of Bti and Bs, replicated four times and the experiment repeated on three different days. Larvae mortality was recorded at 24 or 48 hours after the application of larvicide and subjected to Probit analysis. Laboratory bioassays were followed by semi-field trials to establish initial and residual activity of Bti, and Bs. Semi-field trials were conducted in artificial larval habitats in the open ground and in "mosquito spheres." These larval habitats were colonized with mosquito larvae, treated with Bti and Bs, and the impact of treatments on mosquito larvae monitored.
Results: Lethal concentration that caused 50% and 95% mortalities of test larvae (LC50 and LC95) showed that Anopheles gambiae complex and Culex quinquefasciatus tested were highly susceptible to Bti and Bs under laboratory conditions. Likewise, larvae of Aedes aegypti were highly susceptible to Bti but not to Bs. In semi-field trials, all treatment dosages for Bti provided 91.0–100% larval mortality within 24 hours whereas Bs resulted in 96.8–100% larval mortality within the same timeframe. Bs had a more prolonged residual activity, with pupal reductions ranging from 55.7 to 100% for 9 days at all application rates while the corresponding pupal reduction with Bti was 15.4–100% for 5 days.
Conclusion: Due to the low residual activity of Bti and Bs, weekly application will be required. Based on laboratory findings, Bs product tested would not be recommended for use in the control of Ae. Aegypti.

INF39: Insecticidal efficacy, physical degradation, and fabric integrity of LLINS for malaria control in Mainland Tanzania

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Background: Long-lasting insecticidal nets (LLINs) are effective tool against malaria vectors. Unfortunately, it is not known for how long LLINs will remain effective while in use at field settings of Tanzania. According to WHO standards, LLINs are supposed to remain effective for 3 to 4 years.

Objective: To determine the useful life of LLINs in terms of insecticidal efficacy, durability, and physical integrities in Tanzania.
Methods: This was a retrospective systematic sampling of household for LLIN survey conducted in 22 districts, whereby 150 houses were surveyed. One net from each household was collected and replaced with one LLIN. Household surveys explored on the net usage and physical integrity, while nets were sampled and tested for insecticidal efficacy using cone bioassay tests.
Results: Most nets lost their insecticidal properties dramatically after 2.5 years of use. The mean % mortality in cones never exceeded 40% for each net type (mean ± 95% C.I. Olyset Net = 35% (32-38); Perma Net = 30.6% (27-34) and Safi Nets 14.3% (1.4-30). Nets of all types sampled from the five zones after 2.5 years of field usage failed to meet the bioassay criteria set by the WHO. Using the hole index criteria, more than three quarter of the nets present in households were classified as unusable and ineffective after only 2.5 years of potential use.
Conclusions: The results suggest that most LLINs deteriorate faster than the commonly assumed lifespan of 3 years; this highlights the need for change in the timing for nets replacement. Similarly, we recommend a careful selection of nets based on LLIN durability and not only based on unit price during procurement process. Correspondingly, there is a need for [1]biannual LLIN monitoring system, as this will provide early, timely and actual information on the deteri1orat2ing protective efficacy of nets.

INF40: Malaria vector entomological surveillance in mainland Tanzania: dynamics of vector population and malaria epidemiology among 14 councils from 2017-2019

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Background: Malaria vector entomological surveillance is a monitoring too for host seeking and resting behavior of vectors over time relevant to malaria epidemiology. The success of control interventions depends largely on understanding of susceptible bionomic traits in local malaria vectors.
Objective: To explore the dynamics of malaria vectors and their role in malaria transmission with the aim to attain a set national target.
Methods: Longitudinal malaria vector entomological survey was conducted in 126 houses from 14 councils from January 2017 to December 2019. Indoor and outdoor collections of adult anopheline mosquitoes was done using CDC light trap and resting buckets, respectively. They were identified morphologically, and respective sibling species were determined.
Results: In total 44, 348 mosquitoes were sampled with majority being An. arabiensis (42.69%) and An. funestus s.s (43.94%) while An. gambiae s.s (13.38%). Findings indicate a strong statistical difference ($\chi 2$ =786.39; p value<0.0001) among three vector populations across survey periods. The observed annual infective bites per person decreased from 4.17 (2017) to 0.39 (2019) with An. funestus s.s (4.94) and An. arabiensis (4.14) being the most efficient vectors in 2017 while An. arabiensis (3.63) and An. gambiae s.s (0.78) were most effective in 2018 and 2019, respectively. However, the observed differences in transmission intensity among three malaria vectors across survey periods were not statistically significant ($\chi 2$ =1.4696; p value=0.832). The observed seasonal malaria transmission was reflected in malaria morbidity.
Conclusion: An. funestus s.s, An. arabiensis and An. gambiae s.s are principal malaria vector populations in mainland Tanzania. The dynamic of malaria vectors may complicate control interventions due to outdoor feeding and shift of behavioral patterns over time. Malaria parasite

transmission is independent of malaria vector species over time but varies with seasons as was reflected in malaria morbidity. Findings call for outdoor control interventions.

INF41: Evaluation of malaria case-based surveillance system in Meru District from September 2021 to January 2022

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Background: Early diagnosis, treatment and timely follow up of malaria cases are ultimate factors to disease
eradication in regions with very low malaria burden. Due to significant improvement in prevention and control measures in these settings, malaria case-based surveillance system (mCBS) was established.
Objective: To evaluate the system based on its objectives and assess its attributes and its performance.
Methods: National data were reviewed for malaria cases reported in Kilimanjaro, Arusha and Manyara regions. Convenience sampling based on performance was used to obtain representative district (Meru district) and 10 health facilities for evaluation. Interviews, Malaria case registers and Laboratory malaria rapid test registers were used to assess system attributes using the CDC-Mortality, Morbidity Weekly Report guideline.
Results: A total of 101 malaria cases were recorded from September 2021 to January 2022. Of these cases, the system captured 5% local malaria cases. The system was able to conduct active case detection in 80% of local cases. About 71% of malaria case register forms (MCR) had incomplete information and all private facilities (100%) had not undergone system training.
Conclusion: The system is unstable as there were no funding allocations to private facilities. All facilities submitted monthly reports on time. About 5 local cases depict stratification by National Malaria Control Program. There was poor data quality as there was 70% data mismatch and 30% had complete data in MCR forms.

INF42: Malaria risk factors associated with infections and clustering of cases by households in Muheza district, North-eastern Tanzania

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Background: Malaria remains a major cause of morbidity and mortality in Tanzania despite recently scaled-up control interventions. In the current transition, malaria burden has become heterogeneous with higher burden in some regions compared to others. Thus, stratification and mapping of malaria risk and burden is critical to guide proper use of current and future interventions.
Objective: To assess the risk factors associated with malaria infections and spatial clustering of cases at a micro-geographic level in three villages of Muheza district in Tanga region.

Methods: This cross-sectional study was undertaken in June 2021. Finger prick blood samples were taken from 1,060 individuals for parasite detection by rapid diagnostic tests and microscopy. Socio-economic status and GIS data were also collected. Generalized estimation equation (GEE) was used for assessing clustering of cases by households and identifying risk factors associated with malaria infections.
Results: Males (AOR=1.08 95%CI: 1.03 -1.13, p=0.001) and children aged 5 to 14 years (AOR=1.17, 95%CI: 1.09-1.26, p < 0.001) had higher risk of malaria infections. Febrile individuals with axillary temperature ≥37.50C were more likely to have malaria (OR=1.35; (95%CI: 1.13-1.63, p=0.001) while those living in households with closed eaves had lower risk of infections (AOR=0.93; 95%CI: 0.89-0.98, p=0.012); irrespective of their socio-economic status. Over 90% of participants were using bed nets and there was no significant difference in the risk of malaria infections which was associates with bed net use.
Conclusions and recommendations: These findings show high risk of malaria infections in school children (aged 5 to 14yrs) and individuals living in houses with open eaves. Despite high coverage and use of bed nets, malaria interventions targeting these groups are urgently needed. Further analysis should be done to determine other biotic and abiotic factors which might be associated with high risk of malaria infections at the household level.

INF43: Deletions of the Plasmodium falciparum histidine-rich protein 2/3 genes are common in field isolates from north-eastern Tanzania

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Background: Plasmodium falciparum parasites lacking histidine-rich protein 2 and 3 (pfhrp2/3) genes have been reported in several parts of the world. These deletions are known to compromise the effectiveness of HRP2-based malaria rapid diagnostic tests (HRP2-RDT). The National Malaria Control Programme (NMCP) in Tanzania adopted HRP2-RDTs as a routine tool for malaria diagnosis in 2009 replacing microscopy in many Health facilities.
Objective: To investigate pfhrp2/3 deletions in 122 samples from two areas with diverse malaria transmission intensities in Northeastern Tanzania.
Methods: This cross-sectional study enrolled 998 participants in Handeni and Moshi from April to June 2018. HRP2/Pan-RDTs and microscopy were used for on-site screening. Pfhrp2/3 gene deletion was screened by PCR targeting the exon 2 region.
Results: Pfhrp2 deletion was confirmed in 1.6% of samples while pfhrp3 deletion was confirmed in 50% of samples. We did not find parasites with both pfhrp2 and pfhrp3 deletions among our samples.
Conclusion: Results from this study highlight the need for systematic surveillance of pfhrp2/3 deletions in Tanzania to understand their prevalence and determine their impact on the performance of mRDT.

INF44: Effectiveness and safety of intermittent preventive treatment for malaria using either dihydroartemisinin-piperaquine or artesunate-amodiaquine in reducing malaria-related morbidities and improving cognitive ability in school-aged children in Tanzania: a controlled randomised trial

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Background: In high transmission settings, the majority of school-aged children harbour malaria parasites without showing symptoms (asymptomatic), as a consequence leading to anaemia that may impair their psychomotor and cognitive abilities.
Objectives: To determine the effectiveness and safety of intermittent preventive treatment for malaria in school-aged children (IPTsc) living in highly endemic areas.
Methods: An open-label, individual randomised, clinical trial was conducted in seven primary schools in north-eastern, Tanzania. Schoolchildren (aged 5-15 years) were randomly assigned to receive either Dihydroartemisinin-piperaquine (DP) (n=526) or Artesunate-amodiaquine (ASAQ) (n=527) or no antimalarial treatment (control, n=513), using a balanced block design. The primary endpoints were a change from baseline in haemoglobin (Hb) and a reduction in malaria prevalence after one year of intervention. The interventional treatments were administered by schoolteachers at 4-month intervals during the first year. A second non-interventional year was set to assess possible rebound effects. Data were analysed both by the intention to treat (ITT) and per-protocol (PP). This study is registered with ClinicalTrials.gov, number NCT03640403.
Results: On ITT analysis, during the one year of intervention, compared to the control arm, the increase in mean Hb at one year was 0.50g/dL (95%CI 0.20-0.80, P<0.001) and 0.44g/dL (95%CI 0.10-0.70, P<0.001) for the DP and ASAQ arms, respectively. On PP analysis the increase in mean Hb was 0.61g/dL (95%CI 0.30-1.00, P<0.001) and 0.44g/dL (95% CI 0.10-0.80, P<0.001) for the DP and ASAQ arms, respectively. On ITT analysis, the protective effect of IPTsc on malaria parasitaemia was 65% (95%CI 39-80, P<001) and 51% (95% CI 21-70, p=0.002) for DP and ASAQ arms, respectively against the Control arm. On PP analysis, IPTsc reduced malaria prevalence from 26% to 9% with a protective effect of 78% (95%CI 52-90, P<001) in both interventional arms. In the non-interventional year, there was no significant difference in malaria prevalence or Hb change in all study arms. The psychomotor function was associated with sex, age and Hb. The impact of IPTsc on both psychomotor and cognitive functions was not significant. DP and ASAQ were safe and effective when used for IPTsc.
Conclusion: IPTsc restores malaria-related anaemia, reduces malaria parasitaemia, and is feasibly implementable through schoolteachers.

INF45: Evaluation of the implementation and effectiveness of intermittent preventive treatment for malaria using dihydroartemisinin-piperaquine on reducing malaria burden in school-aged children in Tanzania: an implementation research cluster randomised trial

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Background: In high malaria endemic areas of sub-Saharan Africa, school-aged children (5-15 years) have become increasingly more vulnerable and contribute significantly as reservoirs to onward malaria transmission in the population.
Objective: To evaluate the implementation of the intermittent preventive treatment of malaria in schoolchildren (IPTsc) using Dihydroartemisinin-Piperaquine(DP), for evidence of the operational

feasibility and effectiveness of IPTsc on clinical malaria incidence at a high endemic area in Handeni District Council (DC), Handeni Town Council (TC), and Kilindi DC of Tanga region, Tanzania.
Methods: Wards in the three study districts were the randomisation unit (clusters). Each ward was randomised to implement IPTsc or not (control). All schoolchildren in primary schools located in the IPTsc arm were given DP three times a year in liaising with transmission seasonality. For the impact of the intervention, in each district, 24 randomly selected wards (12 per study arm, one school per ward) were chosen as representatives.
Results: Three rounds of drug dispensing (in Aug 2020, Nov 2020, and Mar 2021) covered 127 primary schools with around 80,000 schoolchildren involved. The average respective coverage of completed dose per round was; 77% (range 68%-83%), 76% (range 69%-82%), and 79%(range 77%-83%). The drugs were well tolerated by the schoolchildren. For impact evaluation, 3752 schoolchildren (1971 DP arm and 1781 control arm) were enrolled. Baseline asymptomatic malaria parasitaemia was 58% for Handeni DC, 20% for Kilindi DC, and 18% for Handeni TC. The average attributable reduction of malaria parasitaemia across all districts was 62% and the effectiveness of IPTsc in preventing clinical malaria over the course of a year was 41% (95%CI 31%-49% p<0.001). Implementation of IPTsc was feasible and well accepted by the communities and teachers.
Conclusion: IPTsc reduces malaria parasitemia, prevents clinical malaria, and is feasibly implementable through schoolteachers. The addition of IPTsc to school health policy is desirable in improving the health and academic achievement of schoolchildren.

INF46: Malaria and Viral haemorrhagic fevers co-infections among febrile outpatients in Tanzania
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Background: In recent years there have been reports of viral haemorrhagic fever (VHF) epidemics in Sub-Saharan Africa where malaria is endemic. VHF and malaria have overlapping clinical presentations making differential diagnosis a challenge.
Objective: To determine the prevalence of selected zoonotic VHFs and malaria co-infections among febrile patients seeking health care in Tanzania.
Methods: This facility-based cross-sectional study was carried out in Buhigwe, Kalambo, Kyela, Kilindi, Kinondoni, Kondoa, Mvomero, and Ukerewe districts in Tanzania. The study involved febrile patients seeking health care from primary healthcare facilities. Blood samples were collected and tested for infections due to malaria, Crimean-Congo haemorrhagic fever (CCHF), Ebola virus disease (EVD), Marburg virus disease (MVD), Rift Valley fever (RVF) and yellow fever (YF). Malaria infections were tested using rapid diagnostics tests while exposure to VHFs was determined by screening for immunoglobulin M antibodies using commercial enzyme-linked immunosorbent assays.
Results: A total of 308 participants (mean age=35±18.9 years) were involved in the study. Of these, 54 (17.5%) had malaria infection and 15 (4.8%) were positive for IgM antibodies against VHFs (RVF=8; CCHF=2; EBV=3; MBV=1; YF=1). Six (1.9%) individuals had both VHF (RVF=2; CCHF=1; EVD=2; MVD=1) and malaria infections. The highest co-infection prevalence (0.6%) was observed among individuals aged 46-60 years (p<0.05). District was significantly associated with co-infection (p<0.05) with the highest prevalence recorded in Buhigwe (1.2%) followed by Kinondoni (0.9%) districts. Headache (100%) and muscle, bone, back and joint pains (83.3%) were the most significant complaints among those infected with both VHFs and malaria (p=0.001).
Conclusions: Co-infections of VHF and malaria are prevalent in Tanzania and affect more the older than the younger populations.

INF47: Seasonality and transmissibility of plasmodium ovale in Bagamoyo District, Tanzania

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Background: Plasmodium ovale (P. ovale) is a neglected malarial parasite that can form latent hypnozoites in the human liver. Over the last decade, molecular surveillance studies of non-falciparum malaria in Africa have highlighted that P. ovale is circulating below the radar, including areas where Plasmodium falciparum (P. falciparum) is in decline. To eliminate malaria where P. ovale is endemic, a better understanding of its epidemiology, asymptomatic carriage, and transmission biology is needed.
Methods: We performed a pilot study on P. ovale transmission as part of an ongoing study of human-to-mosquito transmission of P. falciparum from asymptomatic carriers. To characterize the malaria asymptomatic reservoir, cross-sectional qPCR surveys were conducted in Bagamoyo, Tanzania, over three transmission seasons. Positive individuals were enrolled in transmission studies of P. falciparum using direct skin feeding assays (DFAs) with Anopheles gambiae s.s. (IFAKARA strain) mosquitoes. For a subset of participants who screened positive for P. ovale on the day of DFA, we incubated blood-fed mosquitoes for 14 days to assess sporozoite development.
Results: Molecular surveillance of asymptomatic individuals revealed a P. ovale prevalence of 11% (300/2,718), compared to 29% (780/2,718) for P. falciparum. Prevalence for P. ovale was highest at the beginning of the long rainy season (15.5%, 128/826) in contrast to P. falciparum, which peaked later in both the long and short rainy seasons. Considering that these early-season P. ovale infections were low-density mono-infections (127/128), we speculate many were due to hypnozoite-induced relapse. Six of eight P. ovale-infected asymptomatic individuals who underwent DFAs successfully transmitted P. ovale parasites to An. gambiae.
Conclusions: P. ovale is circulating at 4-15% prevalence among asymptomatic individuals in coastal Tanzania, largely invisible to field diagnostics. A different seasonal peak from co-endemic P. falciparum, the capacity to relapse, and efficient transmission to Anopheles vectors likely contribute to its persistence amid control efforts focused on P. falciparum.

INF48: The usefulness of standardized neonatal infection and reporting tool for surveillance of neonatal infection: experience from Mwananyamala Regional Referral Hospital

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Background: Signs and symptoms of neonatal sepsis are multiple and nonspecific; there are no pathognomonic features. The challenges for clinicians include promptly identifying neonates with a high likelihood of sepsis and distinguishing infants with clinical signs who do not require treatment. Due to a low yield of clinical features, blood culture can confirm the diagnosis in up to 40% of the cases. Mwananyamala Regional Referral Hospital with support from Medipeace developed a neonatal infection reporting tool to address the challenge of clinical diagnosis of neonatal sepsis. The tool helps detect early warning signs and symptoms and other risk factors for neonatal sepsis.
Objective: We report the usefulness of the standardized clinical tool for detecting neonatal sepsis.
Methods: A prospective hospital-based cross-sectional study recruited neonates admitted to the neonatal ward. We used a standardized neonatal infection reporting tool to collect clinical presentation, maternal and neonatal characteristics, perinatal and environmental risk factors, and outcomes. In addition, the blood sample of neonates with possible neonatal sepsis was collected for blood culture. Finally, the descriptive statistics were conducted to determine the proportion of neonates with neonatal sepsis and the laboratory-confirmed neonatal sepsis.
Results: From January to December 2021, there were 7,383 deliveries at Mwananyamala Regional Referral hospital. Out of total deliveries, 1729 (23%) were admitted and assessed for neonatal infection. Only 378(22%) met the criteria of possible neonatal sepsis. We performed blood cultures for 276 (73%) of possible neonatal sepsis. Around 70% of blood cultures were significant culture positive
Conclusion: The standardized neonatal infection and reporting tool increases the accuracy of clinical diagnosis of neonatal sepsis confirmed by blood culture by up to 70%. Therefore, we advocate the tool rollout for the accurate diagnosis of neonatal infections.

INF49: Integrated testing for TB, VL and HIV using GeneXpert in Tanzania Mainland: data extracts from Gene Xpert machines (csv files).

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Background: HIV Viral Load (HVL) and Early Infant Diagnosis (HEID) technologies in many countries including Tanzania are restricted to centralized laboratory testing. The Tanzanian National Health Sector HIV Strategic Plan IV stipulates the need of placing gene Xpert machines (GX) for HEID and HVL and recommends 20% of all HEID and 10% of HVL of clients on ART tested through GX machines. The excess testing capacity can be used not only to meet TB testing demand, but also HEID and HVL testing, which may be mutually beneficial for TB and HIV programmes. While it has been rolled-out in the country at large scale, many challenges remain, including long turnaround times and availability of services.
Objective: To assess operational feasibility, acceptability, and fidelity of integrated testing according to test volumes and turnaround times in Tanzania.
Methods: A cross-sectional study combined both quantitative and qualitative data collection methods was conducted in 36 district hospitals and 108 health centres from 18 selected regions of Tanzania Mainland. Data was obtained through surveys, extraction from GX machines CSV files, FGD and IDIs.

Results: A total of 125 health facilities were assessed, 81 (65%) were health centers and 44 (35%) were hospitals. Majority (81%) of HFs was in rural setting and owned the government. About (39.2%) of HFs had Gene Xpert platforms in place and POC HIV testing services were mostly (68%) in hospitals than health centers. Of the HFs with Gene Xpert, 51% offered POC HIV testing with an average of 23 samples per month and turnaround times of 2 days compared to 2 months turnaround times for samples tested at central laboratory. Maintenance and annual calibration of Gene Xpert machines were performed in more than 70% of HFs despite the observed delay.
Conclusion: Optimization of GX machines for integrated testing in the country is feasible and have seen to fast track HEID and hence treatment initiation and improve quality of life. Therefore, scale up of POC for integrated testing should be accelerated in Health Facilities that met criteria and utilization is not optimal.

INF50: Gaps related to screening and diagnosis of tuberculosis in care cascade in selected health facilities in East Africa countries: a retrospective study
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Background: East Africa countries (Tanzania, Kenya, and Uganda) are among tuberculosis high burdened countries globally.
Objective: To address gaps related to screening and diagnosis in the cascade care towards a world free of tuberculosis by 2035.
Methods: We conducted a three-year (2015-2017) retrospective study using routine program data in 21 health facilities from East Africa. Data abstraction were done at tuberculosis clinics, outpatient departments (OPD), human immunodeficiency virus (HIV) and diabetic clinics, and then complemented with structured interviews with healthcare providers to identify possible gaps related to integration, screening, and diagnosis of tuberculosis. Data were analyzed using STATA™ Version 14.1.
Results: We extracted information from 49,454 presumptive TB patients who were registered in the 21 facilities between January 2015 and December 2017. A total of 9,565 tuberculosis cases were notified; 46.5% (4,450) were bacteriologically confirmed and 31.5% (3,013) were HIV-infected. Prevalence of tuberculosis among presumptive pulmonary tuberculosis cases was 17.4%. The outcomes observed were as follows: 79.8% (7,646) cured or completed treatment, 6.6% (634) died, 13.3% (1,270) lost to follow-up or undocumented and 0.4% (34) treatment failure. In all countries, tuberculosis screening was largely integrated at OPD and HIV clinics. High patient load, weak laboratory specimen referral system, shortage of trained personnel, and frequent interruption of laboratory supplies were the major cited challenges in screening and diagnosis of tuberculosis.
Conclusion: Screening and diagnostic activities were frequently affected by scarcity of human and financial resources. Tuberculosis screening was mainly integrated at OPD and HIV clinics, with less emphasis on the other health facility clinics.
Recommendations: Closing gaps related to TB case finding and diagnosis in developing countries requires sustainable investment for both human and financial resources and strengthen the integration of TB activities within the health system.

INF51: systematic assessment of the relationship of clinical and bacteriological markers for tuberculosis diagnosis and monitoring

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Background: Tuberculosis (TB) is the top killer disease which claimed 1.5 lives in 2020. Rapid and accurate tools are needed for diagnosis and treatment monitoring to expedite clinical decisions and reduce TB associated morbidity and mortality.
Objective: To assess the relationship of symptoms with bacteriological markers for diagnosis and monitoring of treatment response.
Methods: Adult patients (18-65years) with symptoms suggestive of active TB were confirmed bacteriologically by GeneXpert, microscopy, culture and TB-MBLA. GeneXpert positive patients were enrolled and monitored for symptoms resolution and bacillary clearance at week 2, 8, 22 and 26 of treatment. Kaplan Meier and Kappa statistics used to test the relationship between symptoms and bacteriological tests from diagnosis to the end of treatment.
Results: A total of 46 patients with 230 serial samples were analysed: 28(60.9% male; median age (37 years); 18(39.1%) HIV positive and 6(13.04%) were re-treatment. Pre-treatment agreement between TB-MBLA, other bacteriological tests and symptoms was over 80%. Cough, loss of appetite and sputum production had 100% agreement with TB-MBLA. Cough and sputum were over 70% consistent with TB-MBLA positivity by week two of treatment whilst chest pain, sweats and loss of appetite resolved in over 60% patients. The lowest agreement of symptoms with TB-MBLA was between 34-44% at week 8 of treatment. Symptom-TB-MBLA agreement recovered to 75-87% by week 26 of treatment, consistent with decline in TB-MBLA positivity to 8.7% and bacillary load, 5.7±1.3- at baseline to 0.30±1.0-log10eCFU/mL. Inter-bacteriological test agreement was higher than with symptoms and low baseline bacterial load patients were more likely to clear bacillary load, HR 5.6, p=0.003 and, HR 3.2, p=0.014 at treatment week 8 and 26, respectively.
Conclusion: Pre-treatment TB clinical symptoms reflecting bacteriological positivity concurs with TB-MBLA but disappears with time on treatment. Reliance on TB symptoms alone would mislead treatment decisions of many patients.

INF52: Heat or guanidine thiocyanate inactivates viable m.tuberculosis obviating biosafety level iii laboratory infrastructure for molecular tests

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Background: Mycobacterium tuberculosis (M.tb) is a biosafety level 3 pathogen that kills over 1 million people annually. Detection of M.tb by culture or molecular tests requires level III laboratory infrastructure which is expensive to establish in resource poor countries

Objective: To assess the effectiveness of heat and Guanidine thiocyanate (GTC) for inactivation of M.tb prior to molecular tests application in healthcare laboratories.
Method: We used M.tb, H37Rv reference strain and pooled pulmonary TB (PTB) sputum. A 0.5 McFarland standard, approximate to 1.50x107 CFU/mL of M.tb, H37Rv was serially diluted to 10 CFU/mL in Middlebrook 7H9. For sputum, five sputum samples were pooled and homogenised for 30 minutes. GeneXpert MTB/RIF Ultra was performed to check the initial bacterial load and serially diluted the sputum to obtain six 10-fold dilutions. For each dilution of M.tb, H37Rv or sputum, three replicates of 1 mL were boiled at 80ºC for 20 minutes, mixed with 4 mL of GTC for 15 minutes and 2 mL was decontaminated by NALC-NaOH for MGIT liquid culture (controls) following BD MGIT protocol. RNA was extracted following the TB-MBLA protocol.
Results: No M.tb growth observed in MGIT culture for GTC, and heat treated H37Rv cultures and sputum ($p<0.001$) compared to controls. All untreated H37Rv cultures were MGIT positive except the last diluted culture. For sputum, all dilutions were MGIT positive except the last two dilutions. The average bacterial load (BL±SD) of untreated H37Rv neat culture was 6.36±0.33log10 compared to 4.22±0.1log10 for heat ($p=0.36$) and 5.57±0.03log10 for GTC treated ($p=0.71$), respectively. In contrast to H37Rv cultures, GTC treated sputum had average BL of 5.35±3.14log10 compared to 3.48±3.14log10 for heat-treated sputum ($p=0.57$).
Conclusion: Heat or GTC inactivate M.tb preserving adequate RNA for molecular tests. These methods can be applied for inactivation of TB samples prior to molecular tests in healthcare settings without level III laboratory infrastructure.

INF53: Pulmonary function testing and predictive equations in child population in Mbeya, Tanzania
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Background: The increased use of pulmonary function testing in research as well as in diagnosing and managing of lung diseases has led to the need for locally derived reference equations in many African settings. GLI taskforce also acknowledged that there is a lack of spirometric data for certain ethnic groups and encouraged further studies. Reference standards are widely lacking in Sub-Sharan African countries, especially for children.
Objective: To establish lung function values and predictive equations for healthy children living in Mbeya, Tanzania.
Methods: We applied a cross-sectional design. Eligible participants and their parents/caregivers who provided informed consent have undergone anthropometric measurements, e.g., height, weight, answered questionnaire with demographic and behavioural components, and performed lung function testing using a hand-hold spirometer. Data were double entered, coded, and analysed using descriptive statistics and logistic regression to develop predictive equations.
Results: A total of 284 children produced valid spirometry results. The mean age of children was 12.5 (SD 2.2) with equal distribution of males (142) and females (142). Mean FVC in liters was 2.3 (0.6) and mean FEV1 in liters was 2.0 (0.5). Using GLI equations as reference standards, a total of 236 (83.1%) of children had normal lung function with the rest having abnormal ventilation pattern on spirometry – restriction (11.3%) to be the most prevalent. We constructed the predictive Tanzanian equations and

compared them to GLI predictions for this age group (6.5-17.5). Associations with risk factors, e.g., passive smoking or cooking were also assessed.
Conclusions: To our knowledge, this was the first study to obtain local population spirometric equations for children in Tanzania. The pending analyses will reveal to what extend GLI equations are appropriate for this specific African setting and what the relevant risk factors for lung function impairment in Tanzanian children are.

INF54: Declining bacteriologically confirmed TB cases; how the diagnostic technology has failed us
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Background: Tanzania is among the 30 high TB burden countries identified by WHO with approximately 295 TB cases per 100,000 populations. Despite increase in notification of TB cases there was a decline of bacteriologically confirmed cases from 42% to 35% between 2015 and 2019 despite the investment in rapid and more sensitive diagnostic test over the past five years.
Objective: Following the decline of bacteriologically confirmed cases of TB in the country as reported in TB Program Review Report of 2019; NIMR Mbeya in collaboration with National TB and Leprosy Control Programme (NTLP) conducted a rapid assessment on the matter.
Methods: This project employed a retrospective review of TB notification data of 2019 and mixed method cross-sectional study to assess different variants including procedures and practices, case reporting and management.
Results: Bacteriological confirmed TB cases among those notified was 35.1%. Chest X-ray was the leading diagnostic tool used (35%) and a trend of increasing level of health facility with decreasing bacteriological confirmation. Factors such as GeneXpert failure and cartridge stock were linked to low bacteriological confirmed cases in some of the laboratories whereby more than 90% of cartridge shortage and machine breakdown happened in the hospitals. There was inadequate documentation with approximate 24% of data in TB registers were not captured in the ETL database with higher proportion of unregistered cases at the dispensary level.
Conclusion: Delays in calibration of machines, replacement of damaged modules and interrupted supply of cartridges causes overly use of X-ray in TB diagnosis and hence increase the gap in bacteriology confirmation.

INF55: Role of Mobile Diagnostic and Treatment Centre (MDTC) in active case finding and screening of Tuberculosis in Mbeya and Songwe Region.
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Background: Early tuberculosis case detection is important for early initiation of treatment to improve treatment outcomes and to prevent community spread of the disease, especially among hard-to-reach populations.

Objective: To evaluate a community based active case finding using Mobile Diagnostic and Treatment Centre (MDTC) for the detection of tuberculosis cases among hard-to-reach populations in Mbeya and Songwe region in 2020.
Methods: This cross-sectional study used community screening approaches for active tuberculosis (TB) case searching from hard-to-reach populations in Mbeya and Songwe region. The algorithm for TB screening was used; 1) screening for TB symptoms among community residents who visit the mobile laboratory, 2) One sputum sample was collected from each person with presumptive TB for detection of M. tuberculosis by the GeneXpert real-time technique. Descriptive statistics and measures of association were used to summarize the data.
Results: A total of 5976 were screened for TB using MDTC, 590(9.8%) had at least one TB symptoms. 579(98.1%) could produce sputum for the Xpert TB/RIF testing of which 58 (10%) were positive for M. tuberculosis. Of the fifty-eight Positive TB cases, 4 (6.9%) had rifampicin resistance M. tuberculosis infection. TB case detection was significant associated with TB symptoms (Fever, Night sweat and Short of breath P<0.001) and Male Gender (AOR = 2.5; 95%CI: 1.2-5.4).
Conclusions: The study showed that community-based active case through Mobile diagnostic and Treatment Centre proved effective in detecting M. tuberculosis in the communities.

INF56: High burden of tuberculosis infection and disease among people receiving medication assisted treatment for substance use disorder in Tanzania

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Background: Although substance abuse disorder and TB disease are recognised as a growing public health problem, reports on the burden of TB disease and infection among people who use drugs (PWUD) in Tanzania are still scarce.
Objective: To determine the prevalence of tuberculosis (TB) disease and infection as well as incident TB disease among PWUD attending Medication Assisted Treatment (MAT) clinics in Tanzania.
Methods: Prospective cohort study, whereby 901 consenting participants were enrolled from November 2016 to February 2017 and a structured questionnaire administered to them through the open data kit application on android tablets. Twenty-two months later, we revisited the clinics and reviewed 823 of the 901 enrolled participant's medical records in search for documentation on TB disease diagnosis and treatment. Medical records reviewed included those of participants whom at enrolment were asymptomatic, not on TB disease treatment, not on TB preventive therapy and those who had a documented tuberculin skin test result.

Results: Of the 823 medical records reviewed 22 months after enrolment, 42 had been diagnosed and initiated on TB treatment. This is equivalent to a TB disease incidence rate of 2,925.2 patients per 100,000 person years with a total follow up time of 1,440 person-years. At enrolment, the prevalence of TB disease and TB infection was 2.6% and 54% respectively. The HIV prevalence was 44% and 16% among females and males, respectively.
Conclusion: PWUD attending MAT clinics bear an extremely high burden of TB and HIV and are known drivers of TB epidemics. We report a TB disease incidence 12 times that of the general Tanzanian incidence of 237 per 100,000 further emphasizing that this group should be prioritized for TB screening, testing and treatment. Gender specific approaches should also be developed as female PWUDs are markedly more affected with HIV and TB disease than male PWUDs.

INF57: Prevalence, clusters, and burden of complex tuberculosis multimorbidity in Low- and Middle-Income Countries: a systematic review and meta-analysis
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Background: The co-occurrence of tuberculosis and multiple chronic communicable and noncommunicable diseases is a growing concern in low- and middle-income countries (LMICs). Understanding this complex TB multimorbidity' (cTBMM) can contribute to improved patient care.
Objective: To synthesise the prevalence of clusters of cTBMM and their impact on patient outcomes.
Methods: In this systematic review (CRD42020214021) we searched major databases from inception to 01/10/2020 to identify observational studies reporting primary (prevalence or risk) or secondary (related to disease burden) outcome data for people in LMICs with cTBMM. Titles, abstracts and full-text screening, data extraction, and quality assessment were done in duplicate by independent reviewers, and random-effects meta-analyses were performed.
Results: From 21,884 search results, 82 studies representing 773,828 TB patients were included, reporting data on 78 different clusters of cTBMM. In TB patients, the most prevalent co-occurring conditions where depression and anxiety (15.3%, 95% confidence interval [CI] 10.7%-20.5%, 3 studies, 1,473 participants, I2=64%), HIV and anxiety (15.2%, 95%CI 11.3%-19.7%, 4 studies, 1,413 participants, I2=77%), and HIV and post-traumatic stress disorder (14.8%, 95%CI 13.9%-15.8%, 2 studies, 5,400 participants). Sparse evidence indicated lower treatment success and higher risks of death in people with cTBMM.
Conclusion: Although limited by high heterogeneity, this first systematic review and meta-analysis on cTBMM highlights those multiple conditions co-occurring in TB patients are common and that mental disorders often cluster together or with HIV. Further research assessing the burden of cTBMM and identifying effective health systems responses is required.

INF58: Prevalence and risks of tuberculosis multimorbidity in low and middle-income countries: a meta-review
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Background: Co-occurrence of tuberculosis (TB) with other chronic conditions (TB multimorbidity) increases complexity of management and adversely affects health outcomes.
Objective: To map the prevalence of the co-occurrence of one or more chronic conditions in people with TB and associated health risks by systematically reviewing previously published systematic reviews.
Methods: For this meta-review (CRD42020209012) we searched in multiple major databases from inception to 23/10/2020, contacted authors, and reviewed reference lists. Pairs of independent reviewers screened titles, abstracts, and full texts, extracted data, and assessed the included reviews' quality (AMSTAR2). We included systematic reviews reporting data for people in low- and middle-income countries with TB multi-morbidity and synthesized them narratively. We excluded reviews focused on children or specific subgroups (e.g., incarcerated people). The main outcome was prevalence of TB multi-morbidity.
Results: From the 7,557 search results, 54 were included, representing >6,296,000 people with TB. We found that the most prevalent conditions in people with TB were depression (45.19%, 95% Confidence Interval [CI]38.04%-52.55%, 25 studies, 4,903 participants, I2=96.28%, high quality), HIV (31.81%, 95%CI 27.83%-36.07%, 68 studies, 62,696 participants, I2=98%, high quality), and diabetes mellitus (17.7%, 95%CI 15.1%-20.0.5%, 3 studies, 578 participants, I2=81.4%, critically low quality).
Conclusion: We identified several chronic conditions that co-occur in a significant proportion of people with TB. Although limited by varying quality and gaps in the literature, this first meta-review of TB multimorbidity highlights the magnitude of additional ill health burden due to chronic conditions on people with TB.

INF59: Trends of TB cases notification, prevalence and risk factors associated with tuberculosis at central tuberculosis reference laboratory from January to December 2020

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Background: Tuberculosis (TB) is a communicable disease that remains a major global health problem and one of the top ten causes of death worldwide. Monitoring TB case and factors associated with pulmonary TB are essential to improve the effectiveness of TB treatment.
Objective: To determine trends of TB case notification, prevalence and factors associated with pulmonary TB infection among general population referred at Central Tuberculosis Reference Laboratory (CTRL).
Methods: Health facility-based retrospective cross-sectional data were retrieved from CTRL database for TB cases from January to December 2020 in Tanzania. Patients who met TB standard case definition of all ages were included as population under surveillance. Clinical and sociodemographic information of TB patient was obtained from the TB request. Multivariate logistic regression was performed to measure association of factors associated with confirmed pulmonary TB in order to estimate odds ratios and corresponding 95% confidence intervals. A p-value of <0.05 was regarded as statistically significant.
Results: A total of 2495 TB cases with mean age of 38.4 years were registered from January to December 2020. Eastern zone contributed 91.6% of all TB cases of these notified cases, 68.8% were male and 2.7% were children (< 15 years). Positive cases by smear microscopy were 33.7% while 32.5% were confirmed by LJ culture and 54.8% were new and relapse. Proportion of bacteriologically

screened samples by smear microscopy and confirmed by culture were 33.7% and 32.5%, respectively. The first line antibiotics streptomycin, isoniazid, rifampicin, and ethambutol showed sensitivity rate of 99.4%, 9.1%, 96.02% and 92.7%, respectively. Pulmonary TB was significantly associated with age, HIV positive, MRD patient, previously treated patient, diagnosis, and follow-up cases.
Conclusions: Discrepant results between smear microscopy and LJ culture suggest the need to strengthen adherence on technical education and supervision to laboratory personnel.

INF60: Regulatory transcript controlling Interleukin 6 expression in the immune response to mycobacterium tuberculosis
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Background: TB remains a public health threat claiming 1.4 million lives annually despite the presence of anti-TB drugs and the BCG vaccine. A gap exists in understanding TB immune responses. Researches are ongoing to avert the impact of the TB burden as demonstrated by the end TB 2030 targets. Lachmandas and colleagues used RNA-Sequencing to investigate the response of Mycobacterium tuberculosis (Mtb) in human peripheral blood mononuclear cells from healthy donors and they unexpectedly found an upregulation of expression of the IL-6 mRNA and antisense long non-coding regulatory transcript (AS-IL-6).
Objective: To explore the expression of AS-IL-6 transcript to determine its effects on IL-6 mRNA and IL-6 protein concentration in response to Mtb.
Methods: Data from the RNA-Sequencing study by Lachmandas et al. were re-analyzed. This study further recruited 12 healthy donors, whose PBMC were analyzed following 18 hours of stimulation with Mtb lysate, BCG, and lipopolysaccharide. The concentration of IL-6 protein secreted, and the amount of IL-6 mRNA and AS-IL-6 transcript were measured by ELISA and qRT-PCR, respectively.
Results: Re-analysed data showed significant upregulation of the antisense IL-6 transcript following stimulation with Mtb lysate ($P<0.0001$). In this study, Mtb lysate induced the upregulation of both transcripts and the IL-6 protein. Surprisingly, a positive correlation between the IL-6 mRNA and the regulatory anti-sense IL-6 transcripts (spearman $r=0.4769$, $P=0.0872$) and between the concentration of IL-6 protein and the anti-sense IL-6 transcript produced (spearman $r=0.222$, $P=0.4448$) was observed following Mtb lysate stimulation. Similar results were achieved following stimulation with lipopolysaccharide.
Conclusion: Plausibly, the expression of IL-6 transcript has effects on IL-6 protein concentration, as demonstrated by these data. There may be genetic differences underpinning responses due to IL-6 protein produced via the regulatory transcript that needs further exploration.

INF61: Isoniazid preventive therapy coverage and determinants of the coverage in care and treatment clinics in Dar es Salaam

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Background: Tuberculosis (TB) is a major cause of mortality worldwide, with the highest risk in people living with HIV/AIDS (PLWHIVA). The use of Isoniazid preventive therapy (IPT) in combination with ART reduces the overall incidence and mortality from TB by up to 90% among PLWHIVA. The United Republic of Tanzania notified a total of 75,845 TB cases in 2018, but reliable data on IPT coverage among PLWHIVA was not well established.
Objective: To investigate the coverage and determinants of IPT among PLWHIV/A receiving care in the care and treatment clinics (CTCs) in Dar es Salaam Tanzania.
Methods: We used an analytical cross-sectional study design to study 31,480 HIV-positive adults. Proportions and comparisons were obtained using $\chi 2$ tests, while determinants for IPT were assessed using adjusted multivariate logistic regression analysis.
Results: The IPT coverage in this study was generally low, about 48% (n=26321), with more females being covered than males. The determinants for IPT coverage included: being female, above the age of 36, having a CD4 count above 200, and having normal weight (BMI =18.5-24.9 Kg/m2).
Conclusion: The overall coverage of IPT among eligible PLWHIVA was relatively low (48%). However, we have established that being female, above the age of 36, CD4 count above 200, and normal weight determined higher coverage for IPT. More efforts are needed to increase the coverage of IPT.

INF62: Transmission of cryptosporidium species among human and animal local contact networks in Sub-Saharan Africa: multi-country study

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Background: Cryptosporidiosis has been identified as one of the major causes of diarrhoea and diarrhea-associated deaths in young children in sub-Saharan Africa. Even in settings with modern diagnostic facilities, it is estimated that only about 1% of cases are diagnosed and reported. Consequently, in Africa with no advanced diagnostic tools, and lack of awareness Cryptosporidiosis is substantially under recognized, under diagnosed and preventive measures are absent.

Objectives: This study traces back Cryptosporidium-positive children to their human and animal contacts to identify transmission networks.
Methods: Stool samples were collected from children < 5 years of age with diarrhoea in Gabon, Ghana, Madagascar, and Tanzania. Cryptosporidium-positive and -negative initial cases (ICs) were followed to the community, where stool samples from households, neighbours, and animal contacts were obtained. Samples were screened for Cryptosporidium species by immunochromatographic tests and by sequencing the 18S ribosomal RNA gene and further subtyped at the 60 kDa glycoprotein gene (gp60). Transmission clusters were identified, and risk ratios (RRs) calculated.
Results: Among 1363 paediatric ICs, 184 (13%) were diagnosed with Cryptosporidium species. One hundred eight contact networks were sampled from Cryptosporidium-positive and 68 from negative ICs. Identical gp60 subtypes were detected among 2 or more contacts in 39 (36%) of the networks from positive ICs and in 1 contact (1%) from negative ICs. In comparison to Cryptosporidium-negative ICs, positive ICs had an increased risk of having Cryptosporidium-positive household members (RR, 3.6 [95% confidence interval {CI}, 1.7–7.5]) or positive neighbouring children (RR, 2.9 [95% CI, 1.6–5.1]), but no increased risk of having positive animals (RR, 1.2 [95% CI, .8–1.9]) in their contact network.
Conclusions and recommendations: Cryptosporidiosis in rural sub-Saharan Africa is characterized by infection clusters among human contacts, to which zoonotic transmission appears to contribute only marginally. ***(Published: 09 March 2020 https://doi.org/10.1093/cid/ciaa223)***

INF63: Seroprevalence and risk factors of mosquito-borne arboviral diseases in Tanzania
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Background: Periodic outbreaks related to mosquito-borne viral infections are common in sub-Saharan Africa. Despite the evidence that arboviral diseases such as dengue and chikungunya contribute substantially to morbidity in Tanzania, there are only a few isolated studies that have documented their burden, drivers, and vulnerability.
Objectives: To determine seroprevalence, and risk factors of chikungunya (CHIKV), dengue (DENV) and Zika (ZIKV) in Tanzania.
Methods: The study involve Buhigwe, Kalambo, Kilindi, Kinondoni, Kondoa, Kyela, Mvomero, and Ukerewe districts. Blood samples were collected from individuals recruited from households and healthcare facilities. An enzyme-linked immunosorbent assay was used to screen for immunoglobulin G antibodies against CHIKV, DENV and ZIKV.
Results: A total of 1,818 participants (median age = 34 years) were recruited. The overall CHIKV, DENV and ZIKV seroprevalence were 28.0%, 16.1%, and 6.8%, respectively. CHIKV prevalence was highest in Buhigwe (46.8%), DENV in Kinondoni (43.8%), and ZIKV in Ukerewe (10.6%) and Mvomero (10.6%). Increasing age and frequent mosquito bites were significantly associated with CHIKV and DENV seropositivity ($p<0.05$). Having piped water or presence of stagnant water around home ($p < 0.01$) were associated with higher odds of DENV seropositivity. Fever was significantly associated with increased odds of CHIKV seropositivity ($p < 0.001$). Visiting mines had higher odds of ZIKV seropositivity ($p < 0.05$).

Conclusions: These findings indicate that DENV, CHIKV, and ZIKV are circulating in the diverse ecological zones of Tanzania. There is a need to strengthen the control of mosquito-borne viral diseases in Tanzania.

INF64: Seroprevalence of Rift Valley fever in humans, cattle, sheep, and goats in pastoral and non-pastoral districts of Tanzania

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Background: Rift Valley Fever (RVF) is an important zoonotic disease. Data on prevalence of the disease in urban settings and pastoral areas of Tanzania are scarce.
Objectives: To determine seroprevalence and determinants of RVF in humans and animals (cattle, sheep, and goats).
Methods: In Ilala, Rufiji and Sengerema districts, human and animals blood samples were collected and tested for RVFV immunoglobulin G antibodies using Enzyme-linked immunosorbent assay. Logistic regression analysis was used to determine the association between exposure-risk practices and RVFV seropositivity.
Results: The study involved 664 humans and 997 animals (cattle=361; goats=394; sheep=242). The overall RVFV IgG seroprevalences in humans and animals were 2.1% (CI: 0.01, 0.04) and 9.5% (n=95, CI: 0.08, 0.12), respectively. Human seroprevalences in Rufiji, Ilala and Sengerema were 3.0% (n=225, 95%CI: 0.01, 0.06), 1.8% (n=230, CI: 0.005, 0.04) and 1.4% (n=209, CI: 0.01, 0.04), respectively (p>0.05). Animal seroprevalences in Sengerema, Rufiji and Ilala were 12.1% (n=40, CI: 0.09, 0.16), 11.1% (n=37, CI: 0.08, 0.15) and 5.4%, (n=18), respectively (p=0.006, CI: 0.03, 0.08). It was higher in cattle (18.6%; n=67, CI: 0.15, 0.23) than sheep (6.1%; n=16, CI: 0.04, 0.11) and goats (3.1%; n=12, CI: 0.02, 0.05) (p=0.001). Handling carcasses had 12-fold the odds of seropositivity (OR: 11.84, CI: 1.97, 71.16). Use of mosquito nets reduced seropositivity risk by 79% (OR:0.21, CI: 0.05,0.81). People from Rufiji (OR: 8.23, CI: 1.18, 57.02) and Ilala (OR: 2.36, CI: 0.30, 18.78) had eight- and two-times higher odds of seropositivity, respectively, compared to those from Sengerema. Strong positive correlations were found between all animal seropositivity, and human seropositivity (rho=0.904); and cattle seropositivity and human seropositivity (rho =0.867).
Conclusions: The presence of anti-RVFV IgG in humans and domestic ruminants confirms past occurrence of the disease in multiple species. One health approach is recommended for effective risk management.

INF65: Molecular identification of new hantavirus strain on Angolan free-tailed bats (Mops Condylurus) in Mbeya region Tanzania

Presenting author: Lwitiho Sudi[1*]
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Background: Hantaviruses, family Bunyaviridae are emerging zoonotic RNA viruses, which originates from rodents, bats, and shrews with expanded diversity. Understanding the Hantavirus strains circulating in Tanzania opens the dimensions of investigations on its transmissibility and infection control strategies in the community.
Methods: Cross section surveys conducted between July 2017 and September 2018, involved trapping of rodents, shrews and bats on residential areas, agricultural fields, and forest areas in Kyela and Mbarali districts in Mbeya region. Necropsies from the internal organs were collected and screened for Hantavirus using Han-L PCR. Positive samples were purified and sequenced. Phylogenetic analysis was done to assess the evolutionary relationship among Hantavirus strains.
Results: Only (6/334) 1.8% of all bat species trapped were positive for Hantavirus while rodents and shrews were found to be negative. Mops condylurus was confirmed to carry Hantavirus in Mbeya region. The maximum likelihood phylogenetic analysis revealed a previous unidentified bat borne Hantavirus strain which was named Kiwira virus.
Conclusion: A new Hantavirus strain detected from Angolan free-tailed bats (Mops condylurus) in Kyela district confirms the diversity of Hantavirus reservoir host in Africa. Understanding the existence of an infectious agent is important for appropriate public health strategies.

INF66: Agro-pastoralists and animal health professionals' discourse around substandard and counterfeit drugs: Implication for antimicrobial use and antimicrobial resistance control strategies in Tanzania

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Background: Antimicrobial resistance (AMR) is a global problem that leads to increased morbidity and mortality and higher treatment costs in both humans and animals. One of the factors' impacting AMR is drug misuse, including the use of poor-quality medicines (substandard and counterfeit drugs).
Objective: To explore agro-pastoralists perceptions and experiences of substandard and counterfeit veterinary drugs and associate these results with on-going AMR control plans.
Methods: The study was conducted in Arumeru District, Arusha Region. In-depth interviews were conducted with animal health professionals (AHPs), District veterinary officers, livestock field officers and agro vets. Focus group discussions were held with farmers. Themes were produced using thematic analytical approach.
Results: Counterfeit and substandard drugs were locally construed as "madawa feki" (fake drugs). "Dawa feki" was discussed both as a structural and production problem, and due to misuse. Participants believed that, due to inconsistent drug regulation enforcement, there were drugs with the correct labels but containing the wrong or lower active ingredients or drugs that had expired but still sold. Some "legitimate" drug companies were believed to intentionally reduce API after introducing their products in the market. Dishonest businesspersons were believed to produce fake drugs and discreetly introduce them into the market. Fake drugs were discovered at the point of use and labelled "fake" after a treated animal did not improve. Farmers claimed treatment failure was due

to both drug misuses on their part but also as caused by AHPs malpractices. Most AHPs associated drug failure to a farmer's self-treatment practices of their animals.
Conclusions and recommendations: Counterfeit and substandard veterinary drugs were reported to circulate in formal markets because of poor enforcement of drug control regulations. Notions of fake drugs were also associated with poor drug use by farmers and AHPs. More research is needed to ascertain the trajectory of fake drugs in circulation.

INF67: Viral haemorrhagic fevers in Tanzania: Seroprevalence and associated risk factors
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Background: Viral haemorrhagic fevers (VHFs) are a group of zoonotic diseases caused by several distinct groups of viruses from the families Flaviviridae, Phenuiviridae, Arenaviridae, and Filoviridae. Despite the widespread occurrence of VHFs, the true burden in Sub-Saharan African countries is still not sufficiently known.
Objective: To determine the seroprevalence of selected zoonotic viral haemorrhagic fevers (VHFs) and their associated risk factors in Tanzania.
Methods: Blood samples were collected from consenting outpatients and community members in eight districts selected from five ecological zones of Tanzania. Serum was harvested and tested for the presence of immunoglobulin G (IgG) and M (IgM) antibodies against Crimean-Congo haemorrhagic fever (CCHF), Ebola virus disease (EVD), Marburg virus disease (MVD), Rift Valley fever (RVF), and Yellow fever (YF).
Results: The presence of IgM and IgG antibodies against to CCHF, EVD, MVD, RVF, and YF was detected in 64 of 500 (12.8%) samples. The prevalence of IgM and IgG antibodies to CCHF, EVD, MVD, RFV and YF was 2.0%, 3.4%, 1.2%, 4.8%, and 1.4%, respectively. Contact with wild animals (OR = 1.2, CI = 1.3–1.6) and keeping goats (OR = 1.3, CI = 1.5–1.9) were significantly associated with RVF while contact with bats (OR = 1.2, CI = 1.1–1.5) was associated with MVD.
Conclusion: The findings of this study provide evidence of exposure to CCHF, EVD, MVD, RVF and YF in Tanzania. Since most of these VHFs occur without apparent clinical form of the disease, these findings call for the need to strengthen the surveillance system and management of febrile illnesses in Tanzania.

INF68: Non-typhoidal Salmonella serovars in human and animal reservoirs in Korogwe, North-Eastern Tanzania
Presenting author: Joseph William Kaseka[1*]
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Background: Non-typhoidal Salmonella serovars in human and animal reservoirs in Korogwe, North-Eastern Tanzania. Non typhoidal Salmonella is responsible for most childhood bacteraemia and diarrheal illnesses in SSA including Tanzania. Transmission of invasive strains of NTS including Salmonella Typhimirium and Salmonella Enteritidis are common in SSSA and are serotypes associated with high case fatality (20-25%) in infants and immunocompromised individuals.

Objective: To determine the frequency, antibiotic resistance patterns of NTS serotypes as well as comparing these serovars from children with those occurring in chickens.
Methods: A hospital-based cross-sectional study was conducted in Korogwe District Hospital (KDH) in Korogwe Northeastern Tanzania, from March 2019 to April 2020.Children <5 years of age with diarrhoea or history of diarrhoea within the past 24h were enrolled. Study was also involved chickens from farms and community. Blood and stool from children as well as chickens' droppings were collected and cultured. Salmonenella species were confirmed by API 20E test antimicrobial susceptibility testing was performed by disc diffusion and Serotyping was done by White-Kauffmann-Le Minor Scheme.
Results: Of 286 cultured stools from children 18(6.3%) tested positive for NTS while 227 blood culture from children 9 (3.3%) yielded NTS.Of 304 chicken droppings tested, 8 (2.6 %) revealed NTS. Salmonella Typhimurium was the most predominant, n=7 (30%) and it is the only serotype found to be isolated from human and chickens' droppings. Multiple drug resistant NTS were 2(6.1%) which resisted against three or more first line antibiotics including Trimethoprim, Chrolamphenicol and Ampicillin. Study showed no significant variation in terms of resistance and sensitivity patterns among human and chickens NTS except ciprofloxacin p-Value 0.004.
Conclusion: Our results suggest that chicken are among the potential reservoirs of NTS and in turn may contribute to their transmission. Multidrug resistance was observed in chicken NTS, addressing the use of one health approach to curb the spread of MDR. Keywords: Non-typhoid Salmonella, chicken, humans, reservoir, antimicrobial resistance.

INF69: Qualitative inquiry into adolescents' experience of ethical issues in HIV care and treatment at Temeke Hospital, Tanzania
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Background: Adolescents living with human immunodeficiency virus (HIV) experience challenges, including lack of involvement in their care as well nondisclosure of HIV status, which leads to poor adherence to antiretroviral therapy (ART). Parents have authority over their children, but during adolescence there is an increasing desire for independence. The aim of the study was to explore adolescents' experience of challenges identified by adolescents ages 10–19 years attending HIV care and treatment at Temeke Regional Referral Hospital in Tanzania.
Methods: An exploratory descriptive qualitative design was employed in the HIV Care and Treatment Centre (CTC) in the Out-Patient Department at the Temeke Regional Referral Hospital in Tanzania with adolescents living with HIV who were 10–19 years of age. A total of 22 adolescents participated in semi-structured face-to-face interviews after parental consent and adolescent assent were obtained. Participants were interviewed about their participation in decisions to be tested for HIV and enrolled in the CTC, concerns surrounding disclosure of their HIV status to the adolescent or to others, stigma and discrimination, and the effect of these challenges on their adherence to medication. All interviews were audio-taped, transcribed verbatim in Swahili, and back-translated to English. Data analysis included both inductive and deductive thematic analysis.
Results: Qualitative themes identified included lack of participation in decisions about HIV testing, challenges to enrolment in care and treatment; issues around disclosure of HIV status, such as delays in disclosure to the adolescent and disclosure to other persons and benefits and harms of such

disclosures; and factors supporting and interfering with adherence to ART, such as parental support, organizational (clinic) support and problems, and self-stigmatization and shame.
Conclusion: Lack of adolescents' involvement in their care decision making and delayed disclosure of HIV status to the adolescent were identified concerns, leading to poor adherence to ART among adolescents. Disclosure to others, especially teachers, helped adolescents at school to take their medication properly. Disclosure to others led to stigma.

INFP1: Enrichment of antibiotic resistance genes within bacteriophage populations in saliva samples from individuals undergoing oral antibiotic treatments

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Background: Spread of antibiotic resistance is a significant challenge for our modern health care system, and even more so in developing countries with higher prevalence of both infections and resistant bacteria. Faulty usage of antibiotics has been pinpointed as a driving factor in spread of resistant bacteria through selective pressure. However, horizontal gene transfer mediated through bacteriophages may also play an important role in this spread.
Objectives : analysis of resistance genes and viral for Metagenomic long-read sequencing.
Methods: A cross-sectional study was carried out in June 2019 at Tanga Regional Referral Hospital, Tanzania. The study enrolled 25 patients, who had been prescribed oral 286 antibiotics (3–10 days) for treatment of non-oral infections, and 26 patients at the hospital.
Results: We demonstrate significant differences in the oral microbial diversity between infected and non-infected individuals, as well as before and after oral antibiotics treatment. Further, the resistome carried both by bacteria and bacteriophages vary significantly, with ctx-m1 resistance genes being mobilized and enriched within phage populations.
Conclusion: The study has impact on how we consider the spread of resistance in a biological context, as well in terms of treatment regimes

INFP2: Contribution of forgetting to take medication on total missed medication and its effect on viral load suppression among HIV positive children, adolescents, pregnant and breastfeeding women in Kilimanjaro region

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Background: Adherence to Antiretroviral treatment (ART) is crucial for virological suppression. Intervention to monitor adherence to treatment, such as pill counts and pharmacy refills, have been

implemented yet there were not adequate to optimal adherence. The WHO has recommended the use of Digital tools for reminding to take medication, but the contribution of forgetting to take medication has not been fully explored.
Objective: To assess the contribution of forgetting to take medication in total missed medication and its effect on viral load suppression among HIV positive children, adolescents, pregnant and breastfeeding women.
Methods: A cross-sectional study was conducted among children, adolescents, pregnant and breastfeeding women living with HIV on ART in Kilimanjaro region, Tanzania. Socio-demographic, factors associated with forgetting to take medication and viral load results were collected using semi-structured questionnaires. Data analysis was performed using Stata 16.0. Descriptive statistics were summarized using frequency and proportion for categorical variables. Multivariable logistic regression model was used to determine the relationship of forgetting medication intakes in the total missed medication and other factors associated with undetectable viral load suppression.
Results: A total of 427 participants were recruited. A third 142(33.3%) were children, 143(33.4%) adolescents and 142(33.3%) pregnant and breastfeeding women. Their median age was 9 (IQR: 7-12), 18 (IQR: 16-18) and 31 (IQR: 27-36) years, respectively. Ninety-seven (22.7%) of the participants reported skipping medication over the past month. Majority 76(78.3%) was due to forgetting. There was no significant association between forgetting medication intakes and viral load suppression (OR=1.1 95%CI: 0.56-2.03). However never missing clinic appointments decreased the likelihood of being unsuppressed (OR=0.22; CI 95%:0.07-0.7). Always taking medication on time was associated with reduced likelihood of being unsuppressed (OR=0.44 CI95%:0.2-0.9).
Conclusion: Forgetting medication intakes was not significantly associated with viral load suppression though most participants reported missing intakes was due to forgetting, suggests for better interventions to remind people taking their medication on time.

INFP3: The Prevalence of antiretroviral-therapy-related adverse reactions, hospitalisation and mortality among People Living with HIV in Africa: a systematic review and meta-analysis
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Background: Medicines are an important component of any health system. Even though the importance of medicines in the health system is indisputable, the major concerns remain the risk of adverse drug reactions (ADR) when used by consumers. ADRs place a burden on the healthcare system, usually as a result of complications requiring hospital admission or extended hospital admissions in serious cases. About 28.6% ADRs reported from Africa was due to antiretroviral therapy. Recently, the adoption of the "test and treat" policy by the World Health Organization increased the number of people receiving antiretroviral therapy.
Objectives: To explore the magnitude of antiretroviral therapy-related ADR hospitalisations and mortalities in Africa and the implications for the service delivery component of the healthcare system.
Methods: This study used electronic databases, where a systematic search of appropriate articles in March 2021 was analysed. The selection of articles is based on predefined inclusion and exclusion criteria. Thus, data from included articles were extracted as per a set of defined criteria into a data

extraction form. A meta-analysis was done using Stata package software 15.0 using Stata "metaprop-one" procedure.
Results: The findings revealed that the pooled prevalence of ADRs hospitalisations from reviewed studies was 26.5% (95% confidence interval:18.4,35.4) and that of mortality was 6.1% (95% confidence interval:2.1,11.7). The most prevalent ADRs reported include hepatotoxicity, kidney injury, lactic acidosis, skin, neurologic, and hematologic reactions. The antiviral implicated, are non-nucleoside reverse transcriptase inhibitors, nucleoside/tide reverse transcriptase inhibitors, and protease inhibitors. The paediatric population was underrepresented as only two studies included paediatric patients. The economic impact of adverse reactions was impossible to estimate, as only one study reported on financial implications.
Conclusion and recommendation: Antiretroviral therapy related ADRs hospitalisations and mortalities have a high prevalence in Africa. There are concerns about age-related morbidities and lifestyles diseases as risk factors related to ADRs. It is therefore recommended that to adequately combat adverse reactions associated with antiretrovirals, African countries' health systems need multidisciplinary actions to strengthen strategies for prediction, identification, reporting, and prevention of adverse reactions occurrence.

INFP4: Cervical tuberculosis masquerading as cervical cancer in a post-menopausal woman: a rare case

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Background: Primary Tuberculosis (TB) of the cervix is a rare condition among postmenopausal women which is mostly misdiagnosed as cervical cancer and remains unreported.
Objective: We are presenting a rare case of TB of the cervix in a postmenopausal woman who was initially suspected to have carcinoma of the cervix based on her clinical presentation.
Case report: A 62-year-old postmenopausal woman presented with a long-standing history of foul-smelling vaginal discharge and abnormal bleeding for 3 years. She was HIV- negative with no other immunosuppressive conditions, a non-smoker with no history of oral contraceptive use. The general examination was unremarkable. Speculum examination revealed an unhealthy cervix with an ulcer on the anterior cervical lip, suggestive of Cervical Cancer. There was no Human papilloma Virus (HPV) detected on genotyping. A biopsy was taken for histopathology analysis and results revealed multiple epithelioid cells granulomas with scattered Langhans giant cells, caseous necrosis, and abundant lymphocytes, concluding chronic granulomatous inflammation consistent with TB. She responded well to a 6-month period of anti-tuberculosis treatment; Rifampin, Isoniazid, Ethambutol and Pyrazinamide.
Conclusion: This reported case highlights the need to consider TB of the cervix for all post-menopausal women with clinical presentation suggestive of Cervical Cancer and arouse the attention of medical personnel in recognizing similar cases in our setting.

INFP5: External quality assurance (EQA) in intracellular color staining (ICS) and Enzyme-linked Immunosorbent spot forming Assay (ELISPOT): an eight years' experience for EQA analyses in NIMR-Mbeya Medical Research Center, Tanzania

Presenting author: Lwitiho Edwin Sudi[1*]
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Background: Quality control in immunology laboratory requires an establishment of effective trainings, standard operating procedures, internal quality control, validation of tests and external quality assessment (EQA). A structured quality management system subject to regular internal and external audits will minimize the error rate and hence provide assurance on the quality of the results generated as well as conclusion derived from the analysed immunological markers.
Objective: To narrate the importance of EQA in strengthening quality management system for immunology laboratory.
Methods: A retrospective evaluation of external quality assurance data for ICS and ELISPOT since 2014 was conducted. Viability and Cell recovery rates for thawed cryopreserved peripheral blood mononuclear cells (PBMCs) as well as analysis of immunological markers such as IL-2, CD107a, TNFa and IFNg were used to provide pass/fail criteria for the ICS panel. Interferon gamma response on stimulated PBMCs with peptides such as CMVpp65 and PHA were analysed for ELISPOT assay and established ranges of spot forming units from panel providers (EQAPOL) on each peptide were used to determine pass/fail criteria for the external proficiency run.
Results: A total of 10 external proficiency runs for 8-color flow cytometer were conducted since 2013 and the average performances ranges in between 62.5% to 93% with viability and cell recovery rates for above 85% after thawing and after overnight resting of cryopreserved PBMCs. A total of 12 external proficiency runs for the ELISPOT assays were analysed and the average performance ranged in between 70% and 94% for all eight years of participation on external quality assurance.
Conclusion: Besides the challenges for the shipment which contains PBMCs and reagents for EQA across borders, our Immunology laboratory maintained the quality above average threshold of 70% and this ensures the quality of the data generated from the Laboratory is reliable.

INFP6: Factors affecting linkage to HIV care and treatment services among orphans and vulnerable children newly diagnosed with HIV in Tanzania

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Background: HIV response for pediatric populations remains a challenge in Tanzania. In 2019, only 78% of Tanzanian children living with HIV were on antiretroviral therapy (ART), suggesting issues with linkage to HIV care and treatment (CandT) services.
Objective: To examine factors affecting linkage to CandT services among orphans and vulnerable children (OVC) newly diagnosed with HIV in Tanzania.

Methods: OVC enrolled in the community-based USAID-funded Kizazi Kipya project in 24 regions of Tanzania during 2017–2020 who were HIV negative or unknown status at enrolment were further assessed for HIV risks, after which they were referred for HIV testing if at risk. The referrals were tracked by the project, and referral feedback documented. OVC newly tested HIV positive were linked to HIV care and treatment centres (CTCs) to start HIV CandT services. Linkage to CTC was considered successful if the OVC was assigned a CTC-issued identification number, otherwise it was unsuccessful. Factors associated with linkage to CTC were identified using multivariable logistic regression. **Results:** Of the 6,174 OVC (53.4% female) aged 0–17 years who newly tested HIV positive, 96.4% were successfully linked to a CTC for CandT services as of 30 March 2021. In the multivariable analysis, factors with significant positive association with successful linkage to CTC were living in an urban area (OR = 1.43, 95% CI 1.04–1.94) and having health insurance (OR = 1.58, 95% CI 1.02–2.44). Caregiver age was a negative factor, corresponding with a 1% less likelihood of successful linkage to CTC for every one-year increase in age (OR = 0.99, 95% CI 0.979–0.999). These results were adjusted for OVC sex and age; caregiver sex and education; and household economic status and food security. **Conclusion:** The project support to OVC newly diagnosed with HIV resulted in a high rate (96.4%) of linkage to CTC in Tanzania. Although the unreached were few, there is a need to devise additional strategies so that no one is left behind, by addressing critical barriers including rural residences where problems with transport and distance to facilities are substantial, lack of health insurance as well as prioritizing OVC living with elderly caregivers.

INFP7: Efficacy of the most commonly used aerosols for adult mosquitoes' control in Tanzania

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Background: Aerosols are used with a can or bottle that contains a liquid under pressure intended to be delivered to their biological targets. Aerosol insecticides are easier to use and deliver than other forms of insect killers as such does not need professionals to use. Currently Several different products of Household aerosol space sprays containing synergized pyrethrum or synthetic pyrethroids in combination with other insecticides of different classes are available in retails in Tanzania.
Objective: Purpose of this study was to evaluate the efficacy of the household aerosol space sprays most commonly available in commercial retails in Tanzania with the purpose of asserting their efficacy.
Methods: Testing was done on five aerosol insecticides that are readily available on the markets and mostly used in households. The testing followed World Health Organization Pesticide Evaluation Scheme (WHOPES) standards as per requirement in aerosol testing. The number of mosquitoes knocked down was recorded after 3 and every 10-minute intervals for a total of 60 minutes using a hand counter. The knocked down and all remaining mosquitoes were carefully transferred into separate clean holding cups. Mosquitoes were provided with 10% sugar solution on cotton wool and held for 24 hours at 27 ± 20C and 80 % ± 10% RH. The mortality was recorded 24 hours after exposure.
Results: The study has confirmed that against susceptible mosquitoes, pyrethroid isomers that constitute in the aerosols tested in this study prove to be very potent.
Conclusion: With resistant population it has been shown in this study that the use of aerosols that combines two or more insecticides with different modes of actions and synergy would yield to better efficacy against resistant mosquitoes.

Symposia

These symposia provided a forum for focused discussions on new and emerging health issues and innovations. As they involved several specialists and a swapping of ideas, the midpoints of the focus were around specific themes and significant work done by individuals, organisations, or research consortia. The following symposia featured during the conference:

Symposium # 01

Direct and indirect impacts of COVID-19 control measures on health and social systems in Tanzania

Organized by: National Institute for Medical Research

Impact of Coronavirus Disease 2019 And Its Control Measures on The Provision and Utilisation of Care in The United Republic of Tanzania

Presenting author: Elizabeth Shayo

Co-authors: Leonard E.G. Mboera[2*], Clotilda S. Tarimo[3], Ame Masemo[4], Blandina T. Mmbaga3, Giuliano Russo[5], Esther Ngadaya[6], Mark Urassa[7], Mohamed Seif[8], Mtumwa Bakari[1], Nahya Nassor[4], Peter E. Mangesho[8] and David McCoy[5]

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Background: Coronavirus disease 2019 (COVID-19) pandemic has caused profound effect on health, economic progress, social cohesion, and trust in governments. This study explored the impacts of the COVID-19 on the healthcare system in three districts of the United Republic of Tanzania.

Methods: This cross-sectional study was carried out in Mjini Magharibi, Chake and Ilala districts in Tanzania. The study employed a multi-stage exploratory sequential mixed-methods study design. Data was collected through a mix of key informant interviews with national, regional and district officials, focus group discussions with community members and health care workers and semi-structured interviews with community members and influential people. Information sought was related to experiences related to COVID-19 response measures and their impacts on accessibility and utilisation of health care services.

Results: The effects of COVID-19 were mainly on reduced healthcare service utilization in terms of shifting attention of service to COVID-19 response and inadequate resources. Overall, hospital services were reduced during COVID-19 outbreak for number of reasons: patients not coming to the hospital because of fear of contracting COVID-19, lack of adequate supply of medicines, closure of some clinics, and inadequate workforce. There was an increase in workload and waiting time in the lower healthcare facilities. COVID-19 caused fear among healthcare providers, patients, and the community in general. Generally, there was a decline in the provision of primary and specific health services as most resources were diverted towards management of COVID-19. Essential services including antenatal clinics and disease control programmes suffered due to shortages and diversion of resources.

Conclusions: The indirect effects of COVID-19 on health service delivery in Tanzania included fear to access health care, inadequate and diversion of health workforce, inadequate infrastructure, and medical supplies. The findings provide an alarm of the need for strengthening health systems for future epidemic preparedness.

Impact of Coronavirus Disease and its Control measures on mental health in the United Republic of Tanzania

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Background: The Corona virus disease 2019 (COVID-19) pandemic has led to unprecedented hazards to mental health globally in different sectors with increased in anxiety, worries, stress, and fear in the communities. This study aimed to explore the impact of COVID 19 disease on mental health in the United Republic of Tanzania.
Methods: The cross-sectional study was carried out in the districts of Chakechake, Mjini Magharibi, and Ilala in the United Republic of Tanzania. Qualitative study was done using a combination of key informant interviews, focus group discussions with health workers, and semi-structured interviews with community members and central and local government officials.
Results: Findings have revealed that during the COVID19, people experienced different levels of stress, stigma, depression, and anxiety preceded by fear and worries. These were mainly due to restrictions on religious practice which interfered people's serenity hence causing psychological instability, fear of health-seeking and medical attention at the health facilities. Social isolation and stigma for health workers, fear, and panic of contracting and dying from the COVID-19, lack of medical supplies and heavy workload to health-care workers exacerbated mental health fear and stress. Government leaders and the community implemented coping mechanisms such religious guidance and inspiration, increasing the availability of medical products and workforce, and using local remedies for COVID19 prevention and treatment.
Conclusion: Stress, stigma, depression, and anxiety during COVID 19 restrictions affected mental health. Ongoing psychological support in the community and for health workers who are the front-line soldiers should be one of the priorities to support coping with fear and worries.

The Effects of COVID-19 on gender, children, and household relationships in Tanzania

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Background: The COVID-19 pandemic has disrupted family routines, relationships, projects, and sociability giving rise to multiple outcomes threatening the health, income, social cohesion, and well-being of individuals and their families. This study aimed to qualitatively evaluate the effects of COVID-19 pandemic on gender and household relationships in Tanzania.
Methods: This was a cross-sectional study conducted in Dar es Salaam, Unguja and Pemba employing multi-stage exploratory sequential mixed-method study design. Data were collected through key informant interviews, focus group discussions and semi-structured interviews. Participants were national, regional and district officials, community health volunteers, influential persons, traditional healers, traditional birth attendants, community members, community leaders and health workers. Information collected focused on the effect of COVID-19 control measures on gender, children, and household relationships.
Results: Overall, the findings demonstrated a breadth of responses. Many families reported increased gender-based violence, children engaging in child labour, household conflicts due to economic hardship and strained family relationships. In contrast, some positive benefits were reported to include strengthened household relationships, as movement restriction provided ample time for family to stay together during the day. Parents had much time with their partners and children when COVID-19 control measures were in place.
Conclusion: Although Tanzania implemented COVID-19 control measures without exercising total lockdown, the pandemic had substantial effects on gender-based violence and household relationships. The results call for the need for the government and other stakeholders to strengthen the social welfare interventions in response to epidemics and other emergencies.

The Effects of COVID-19 and of the policy response on access and utilization of maternal and child health services in Tanzania

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Background: Tanzania as other parts of the world experienced several waves of Corona Virus Disease (COVID-19). However, little is known on the extent to which the disease has affected access and delivery of maternal and child health services. The study aims to explore and measure the effects of COVID-19 and of the related response measures on access and utilization of maternal and child health services in Tanzania.
Methods: This cross-sectional study was conducted in Mjini Magharibi and Chake Chake in Zanzibar and Ilala districts in the mainland, representing urban as well as rural areas in Tanzania. It employed a mixed methods study design using both quantitative and qualitative data collection techniques where we conducted 34 in-depth interviews with key informants and influential community persons, 60 semi-structured interviews with household members, complemented with 11 focus group discussions with community leaders, members, and health care providers.
Results: Study participants from both settings reported to have observed the effects of COVID-19 on maternal and child health attributed to measures that were taken to contain the pandemic. COVID-19 prevention and treatment services were given more priorities which jeopardized other services. Scarcity of medical commodities were widely reported, including vaccines, equipment, and other medical supplies due to ban of international travels. There was rescheduling of medical appointments; shorter time for delivering mothers to stay in the health facility; rescheduling of reproductive and child health clinic from monthly to quarterly appointments and reduced time for health education and child growth monitoring. Fear of getting infected with corona virus was reported by mothers and care providers. Our informants linked such effects to a lower uptake of antenatal and postnatal, postnatal, family planning and immunisation services and institutional deliveries.
Conclusion: The effect of directing efforts to COVID-19 and its measures taken to restructuring the health system led to reduction in Reproductive and Child Health (RCH) services delivery. Hence, preparedness plan for balancing maternal and child health (MCH) service provision need to be worked out ready for implementation to maintain standards and quality of service provided to mothers and children in future pandemics in order to meet defined international and national goals.

The Effects of The COVID-19 Pandemic on livelihoods and social support mechanisms in Pemba, Unguja and Ilala, Tanzania: a qualitative study

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Background: Coronavirus disease 2019 (COVID-19) has contributed to massive disturbances on people's economic, social, and cultural aspects. Such experiences were brought by the pandemic itself, but also by the policy measures put in place to contain the transmission of the disease. This study assessed the impacts of the COVID-19 pandemic on social and economic lives in Tanzania.
Methods: The cross-sectional study was conducted in Mjini Magharibi, Chake Chake and Ilala districts in the United Republic of Tanzania. The study employed a qualitative design combining focus group discussions, in-depth interviews and semi-structured interviews with community members, leaders, and government officials. Data were analysed using thematic analysis approach.
Results: The main impact of COVID-19 was on businesses and trade, with loss of wage earnings due to a reduction in tourism activities and reduction of essential goods for trade flow from abroad. This, in turn, affected people's purchasing power to fend for themselves, causing food insecurity at the household level. Trade and trading were affected due to the rising prices of essential goods. Restrictions imposed on gatherings created an atmosphere of fear that affected social life and harmed traditional forms of support in times of need. They included participation in religious gatherings, caring for the old and sick, traditional, and religious support during bereavement and burial of suspected COVID-19 deaths.
C**onclusions:** The study have highlighted the impacts COVID-19 pandemic on social and economic life among Tanzanians as a result of implementation of its control measures. In the future, we recommend support programs to vulnerable households such as food or financial support during outbreaks. The control of essential goods' prices to shield poor households from falling further into poverty should also be considered.

Symposium # 02:
The role of strengthening Tanzania's clinical research oversight and pharmacovigilance capacities to address challenges in research and development
Organized by: Tanzania Medicines and Medical Devices Authority (TMDA): ASCEND Project

Training Needs assessment for clinical trials assessors in Tanzania and implementation of targeted capacity building to bridge the gap

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The volume of clinical research in Tanzania has increased rapidly in the last 10 years and so has the demand on research ethics committees and medicines regulators to approve and monitor research. In the same vein the (re-)emergence of highly infectious diseases have tested the readiness of ethics committees and medicine regulators across Africa. The need for ethical and regulatory capacity to respond in a timely manner cannot be emphasised more. Through our EDCTP funded SMERT grant, progress has been made resulting in establishment of electronic systems to expedite research ethics review at the National Health Research Committee and reporting of adverse drug events in clinical trials. Despite this progress, there are still substantial gaps that ASCEND will address in order to make Tanzania ready to ensure quality and safety of medicines and performance of Good Clinical Practice (GCP) compliant clinical trials.

The concept of research ethics and pharmacovigilance remains abstract to the majority in the community, which consequently compromises the effectiveness of ensuring ethical research and reporting of adverse drug events (ADEs). ASCEND will use the opportunity to sensitize members of the public on their rights and responsibilities to question the ethics of research they are participating in and to report any ADE. Tanzania Medicines and Medical Devices Authority (TMDA) and Muhimbili University of Allied Health Sciences (MUHAS) are Regional Centres of Regulatory Excellence (RCOREs) for medicines evaluation and excellence with a mandate of enabling national medicines regulatory authorities (NMRA) to develop their medicines regulatory capacity. However, the RCORE itself lacks the capacity to achieve their mandate.

ASCEND will support the MUHAS/TMDA RCORE to develop human and infrastructural capacity to perform their duties. Zanzibar has recently established their national research ethics committee and medicines regulatory authority needs capacity building to effectively execute their mandated duties. Through ASCEND, ethics committee members and pharmacovigilance monitors will be trained, and a mentoring scheme put in place to ensure sustainable capacity building beyond the ASCEND project.

Training needs assessment for Good Clinical Practice inspectors in Tanzania and implementation of targeted capacity building to bridge the gap

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Background: The Coronavirus Virus Disease 2019 (COVID-19) has increased demand for new medicines, vaccines, and diagnostics, and therefore regulatory authorities need to keep a good oversight of the development of these products in the interest of public health. For Tanzania, Tanzania Medicines, and Medical Devices Authority (TMDA) is responsible for regulating clinical trials conducted in the country. In this responsibility, TMDA needs a competent pool of Good Clinical Practice inspectors. Therefore, the present study was aimed at determining the level of competency and training needs of clinical inspectors in Tanzania.
Methodology: A descriptive cross-sectional study was conducted from February 2021 to June 2021 using an online survey to gather all required information. Participants with bachelor's degrees and Doctor of Philosophy were almost equal in proportion with 21.1 % and 20.0 %, respectively.
Results: The results indicated that 69.2% (90/130) of participants responded to the survey. Most of the participants, 58.9% (53/90), were male. On an educational level, more than half of the participants had a master's degree 58.9% (53/90). Participants with bachelor's degrees and Doctor of Philosophy were almost equal in proportion with 21.1 % and 20.0 %, respectively. Only 12.8% (n=10) of the respondents were competent in understanding and using the checklist for inspection of clinical trials. This was identified as gap need to be addressed by training more GCP inspectors to increase the pool. These findings were used to develop 70 hours (7 credits) of a short course curriculum for Good Clinical Practice (GCP) Inspection that was developed jointly and accredited by the Directorate for Continued Professional Development at the Muhimbili University of Health and Allied Sciences (MUHAS). Therefore, a two-week short training was organized and conducted, the analysis of pre and post-test results revealed that the median score significantly increased from 55 in pretext to 65 in post-test ($p<0.05$) which implied that the training had a positive impact.
Conclusion: There was a small number of proficient GCP inspectors regarding the use of African Vaccine Regulatory Forum (AVAREF) guidelines for GCP inspection. The training conducted increased the knowledge and competency of GCP inspectors in Tanzania. Similar trainings should be conducted at regular intervals.

Customization of the bioethics training curriculum to the online training model in Low- and Medium-Income Countries

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Background: Bioethics training is critical for researcher and students in low- and middle-income countries to enable ethical conduct of research. We developed a bioethics curriculum informed by expertise in the region and local cultural context in Tanzania and customized it to massive open online course (MOOC) training. The objective of the study was to customize the bioethics training model to the online training course for postgraduate students, faculties, and researchers.
Methodology: Between 2017-2019 a bioethics curriculum informed by expertise in the region and local cultural context was developed at the Kilimanjaro Christian Medical University College (KCMUCo). Stages in curriculum development included considering the need for a structured curriculum, identifying the critical stakeholders and then provided the platform and resources to discuss and appraise evidence for what the curriculum should cover. In 2021 under the ASCEND project the curriculum was customized to online training for student and health researchers.
Results: A 40 hours (about 1 and a half days) course tailored for local settings for postgraduates and other researchers was developed. We selected 14 topics that put together local and current case studies and draws greatly from local cultural considerations of what constitutes ethical conduct whilst reflecting on the contemporary cases of ethical misconduct adjudicated in the country and low- and middle-income countries at large. All 14 courses have been recorded for the MOOC training by 10 instructors from KCMUCO (2), MUHAS (5), TMDA (1) and NIMR (2) and can be used for training of postgraduate students, faculty, and researchers to understand international and local ethics contents. The course highlights the importance of social responsibility of global health researchers, ethical response in public health emergencies, and the legal implications in the event of ethical misconduct.
Conclusion: Bioethics training in LMICs should focus on the emphasis to adapt local training context drawing from daily clinical and research settings, which should include culture, community engagement, social responsibility of the global health researchers in addition to safety science. This contextualized bioethics online training course will enhance the conduct of ethics research at all levels in Tanzania.

Effectiveness of a structured stimulated spontaneous safety monitoring of medicines reporting program in strengthening pharmacovigilance system in Tanzania

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Background: Adverse drug events (ADEs) present a major global health problem that contributes to increased morbidity, mortality, and healthcare cost. However, under-reporting of ADEs is a challenge facing developing countries including Tanzania. This study aimed to develop and assess the effectiveness of a 'structured stimulated spontaneous safety monitoring' (SSSSM) reporting program of ADEs which aimed at strengthening pharmacovigilance system in Tanzania.
Methodology: The program was developed in seven tertiary hospitals. A quasi-experimental study design was used to assess the effect of intervention after the introduction of program. ADEs data were collected from a single group and compared for 18 months before (June 2017 to December 2018) and after the program (January 2019 to June 2020).
Results: Out of reported ADEs, 98.6% (16,332) were reported after intervention, of which 96.4% (15,959) were non-serious and 3.6% (598) serious. A total of 0.1% (23) death related to adverse drug reactions (ADRs) were reported. There was an increase from 20 to 11,637 ADRs after intervention in Dar es salaam, 49 to 316 in Kilimanjaro and 17 to 77 in Mbeya. The population-based reporting ratio per 1,000,000 inhabitants increased from 2 reports per million inhabitants in 2018 to 85 reports in 2019. The program was able to detect signals associated with the use of different medicines.
Conclusion: The SSSSM program increased the reporting rate of ADEs and is useful in detecting signals from all types of medicines. This was first effective developed spontaneous program to monitor medicine safety in Tanzania.

Symposium # 03:
The improved community health fund (CHF iliyoboreshwa) - Transforming a modest prepayment scheme to a viable health insurance
Organized by: Swiss TPH; Health Promotion and System Strengthening (HPSS) Project

Implementation of improved Community Health Funds (iCHF): Results, Challenges and Lessons Learnt on enrolling informal sector in the health insurance
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Background: The Implementation of the improved Community Health Funds (iCHF) (CHF Iliyoboreshwa) through the government (PORALG) circular number 1 for the implementation of the reforms on the formal Community Health Funds started in July 2018. The reforms introduce separation of purchase and provider roles, introduce 26 regional pools and dedicated coordination teams at the regional, district and national level as well as expanded and portable benefit packages up to the Regional Referral Hospital across the country. The study aimed to share results, challenges and lessons learnt from the implementation of the improved scheme
Methods: All data were obtained from the operational reports and from the Insurance Management Information System (CHF-IMIS). The data are from July 2018 to April 2022.
Results: CHF Iliyoboreshwa is operational in 26 regions of Mainland Tanzania, with enrolment agents at all villages and Mitaa. Members can access services to all public health facilities (nearly 6000) from dispensary to regional referral hospital. The scheme has so far enrolled 3, 922,793 (7%) of Tanzanian as of April 2022, out of these 1,733,742 are female and 2,189,051. The 26 pools have collected at total of TZS 27,555,897,400. By January 2022, a total of TZS 17,409,271,161 has been paid to the health facilities as reimbursement of claims. Share of CHF in financing health care services is noticeable.

Conclusion: The past 36 months of implementation of the iCHF have recorded notable results on increasing number of households in Tanzania with health insurance cards which are trackable through the CHF-IMIS. Members have wider access to health services and remove geographical boundaries on access to services. The lessons learnt from the implementation inform the government on areas for improvement such as enrolment structure, a need for making insurance mandatory others are review the reimbursement mechanism and engagement of private sector.

Supporting the reform of the Community Health Funds: From pilot to the National Health Insurance Scheme "Improved Community Health Fund" (CHF iliyoboreshwa, or ICHF)

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Background: Within the symposium on the reform of the Community Health Fund, this presentation provides an overview on the support given by the Swiss Government to the concept development and implementation of the Community Health Fund (CHF) reform. The CHF was introduced in Tanzania 2001 countrywide as a district operated voluntary prepayment mechanism, aiming at generating a cost contribution from the larger population to the delivery of health services. Major shortfalls, however, included a limited benefit package with access to dispensaries and health centers, weak data collection and utilization, no incentives for health facilities to treat CHF members, weaknesses in the enrolment mechanism, and limited resource generation.
Methods: In 2011 the Tanzanian-Swiss "Health Promotion and System Strengthening Project" Health Promotion and System Strengthening (HPSS) was mandated by the Tanzanian Government and the Swiss Agency for Development and Cooperation (SDC) to develop and test innovations for the CHF. The Swiss Tropical and Public Health Institute are implementing this support project.
Results: Innovative concepts and features were developed for the transformation of the CHF into a fully-fledged health insurance system, and tested first in Dodoma, followed by Shinyanga and Morogoro Regions, and since 2018 scaled up by the GoT to a national scheme implemented in all councils of mainland Tanzania. Characteristics of the re-organised "CHF Iliyoboreshwa" are professionalized procedures, "active" enrolment through enrolment officers; use of mobile phones for enrolment and claim management; and individual ID cards providing access to all Governmental health facilities up to regional hospitals ("portability"). The innovative 'Insurance Management Information System' (IMIS) is managed by the President's Office-Regional Administration and Local Government (PORALG). It provides both on-line and off-line communication and since 2022 enables membership payments through mobile phone. As per today about 1.6 million persons are members of the iCHF with an active policy.

Assessment of members and Non-members perspective on Community Health Funds (ICHFS) membership and services to help inform strategies to increase enrolment

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Background: Community Health Funds (CHFs) are voluntary community-based prepayment schemes, which aim at building a sustainable financing mechanism for health care**.** The improved CHF program in Tanzania (iCHF) rolled out in 2018 – aimed at strengthening CHF structures and procedures, to vastly improve the benefit package of the CHF and to increase enrolment in the scheme. With these improvements there are notable progress on CHF enrolment whereby over 3 million individuals are enrolled in the scheme countrywide. This study objective was to assess members, non-members, and non-renewals perspective on iCHF membership and services to help inform strategies to increase enrolment.
Methods: This was a mixed method cross sectional study design combining qualitative and quantitative methods. A multistage sampling technique was applied to identify 2000 respondents in five regions of Tanzania. Qualitative data was collected from 40 focus group discussion. Quantitative data is currently analyzed using Stata while qualitative data is analyzed using Framework analysis. Data analysis is ongoing.
Results: Preliminary findings indicate that majority of respondents (>80%) know about iCHF. The key reasons for not joining iCHF is shortage of drugs at health facilities and health providers not valuing iCHF members. For active CHF members, motivation to continue renewing membership is assurance of consultation and diagnosis at health facilities but also availability of enrolment officers in the villages. Majority of respondents do not know iCHF benefit packages while those from the richest regions considered iCHF as insurance for the poor. Availability of health facilities is strongly associated with decision to join/not joining iCHF while faith-based health facilities are highly recommended to be included in iCHF service scheme.
Conclusions: Acting on the necessity of the current iCHF scheme to increase enrolments, availability of medicines at health facilities need to be improved while extending iCHF services to faith-based health facilities. Promoting and marketing iCHF benefit packages is crucial to ensure increased enrolment.

Assessment Of the financial viability of the improved Community Health Funds Scheme to inform stakeholders on the future improvement in Tanzania

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Background: Tanzania is on the way to its goal of Universal Health Coverage (UHC) for its population. Currently, different health financing strategies such as implementation of Community Health Fund (iCHF) to increase health insurance coverage are underway. Achieving UHC through, health insurance is as far from the reality due to small population (14%) covered by health insurance. The objective of the study was to identify the critical components of the financial viability of the iCHF scheme in its current design to inform stakeholders on the future improvement of the scheme.
Methods: Secondary data extraction and in-depth interviews (IDI) were conducted from six regions in April 2022. IDI were conducted with the iCHF administrators, healthcare managers, public and private providers. Framework analysis was adopted during qualitative analysis.
Results: The iCHF has been operational for over 36 months across the country and have enrolled over 3 million Tanzanians. A total of TZS 27 billion (cumulative) have been collected and TZS 17 billion has been reimbursed to the health facilities as members access services to nearly 6,000 health facilities. The study regions have a total of about 960,677 TASAF individual, of whom 360,637(38%) currently are enrolled into iCHF. To provide subsidized iCHF insurance coverage to the Tanzania Social Action Fund (TASAF) beneficiaries, the government will need TZS29,677,604,065 (US$12,903,306) at the current premium rates. Extension of service provision to private for and not for profits remains on the decision of the facility board, health facility owners, and contractual commitment for those with service agreement. Whereas delayed disbursement of basket funds and facility claim payment shifted the burden to the facilities and hence introducing co-payment as a bridging mechanism to easy the costs for service provision.
Conclusion: The preliminary findings reveal that there is a need to revisit the premium, formula for reimbursing facilities, and inform the healthcare providers on the payment modalities. In addition, service agreement between councils and private health facilities needs to be reviewed time to time to accommodate changes in the course of implementation. TASAF has a potential to administer government pro-poor funds given its administrative structures from national to the grassroots level.

Symposium # 04:
Malaria Preventive Therapies.

Intermittent Preventive Treatment among school children in settings with high malaria risk burden
Presenting author: Godfrey Makenga[5*]
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Background: In mainland Tanzania, implementation of preventive measures including insecticide treated nets, indoor residual spraying and intermittent preventive treatments in pregnancy and treatment with efficacious antimalarials has helped in reducing malaria prevalence. However, there is great heterogeneity within different areas, with the North-Western and South-Eastern zones still having high burden of malaria. Hence, targeted interventions are currently recommended to reduce malaria burden in high transmission risk areas. Among them is Intermittent Preventive Treatment

among primary school children (IPTsc). IPTsc is the provision of full dose of artemisinin-combination therapies (ACT) to all primary school going children irrespectively from their parasitological status.
Methods: With support from Towards Elimination of Malaria in Tanzania (TEMT) project, NMCP implemented IPTsc in Kibondo District Council (DC) in Kigoma region from December 2020. Three rounds of IPTsc have been conducted (Dec-2020, May-2021 and Oct-2021) whereby Dihydroartemisinine Piperaquine (DP) was administered to all primary school children. Teachers were trained and were responsible for administration of DP supervised by health workers from the nearby facility. Additionally, mRDT testing was done in each round among 18 selected schools. Approximately 60 students across class I – VII were selected randomly (controlling for gender) from each school and tested.
Results: Coverage of a full three-day course of DP was 65%, 81% and 72% among the three rounds, respectively. Approximately 27%, 10% and 18% did not receive treatment across the three rounds respectively with absenteeism being the main reason across all three rounds. The overall prevalence across the schools declined from 15.8% to 11.1% to 8.9% across rounds one, two and three, respectively. School Malaria and Parasitological Survey (SMPS) 2021 data shows decline in prevalence from 25.5 to 4.4%% in 2019 and 2021, immediately before and after IPTsc, respectively.
Discussions: The experience from Kibondo DC, has shown that IPTsc has a role to play in reduction of malaria burden in high-risk settings.

Implementation Study to evaluate the effectiveness of routine health services on delivering intermittent preventive treatment for malaria in infants in Southern Tanzania
Presenting author: Muhidin Mahende[1*]
Co-authors: Prosper Chaki[1*], Sigsbert Mkude[1], Fatma Manzi[1], Hajirani Mussa[1], Godlove Chila[1], Michael Mihayo[1], Farida Hassan[1], Silas Temu[1], Fabrizio Molteni[3], Frank Chacky[2], Abdallah Lusasi[2], Lazaro Nhiga[2], Ally Mohamed[2].
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Background: Intermittent preventive treatment of malaria in infants (IPTi) consists of the administration of a treatment dose of an antimalarial regimen at the time of routine vaccinations. Using the Immunization and Vaccines Development (IVD) platform prophylactic treatment of malaria in children below 1 year was given in selected facilities. Pre-post surveys were conducted to investigate the effect of IPTi on malaria, anaemia, and all-cause mortality in children aged 6-59 months in 52 villages in southern Tanzania.
Methods: The pilot project was implemented from March 2021 to February 2022 in Nachingwea, Ruangwa and Liwale Districts located in southern Tanzania. Intervention districts received IPTi while control implemented the existing Ministry of Health programmes. Antimalarials Sulfadoxine-Pyrimethamine (SP) was given in Nachingwea (26 health facilities) and Dihydroartemisin-Piperaquine (DP) in Ruangwa (26 health facilities) during Penta 2 (10weeks), Penta 3 (14weeks) and MR1 (9 months) visits. Assessment of the change in malaria and anaemia prevalence was done in a logistic model using pre-post survey data. A secondary analysis also studied the malaria incidence reported at the health facilities (HFs) during the intervention using routine data. Incidence rates between IPTi and non-implementing health facilities were calculated, and all statistical testing was done.
Results: Cross-sectional surveys prove that malaria prevalence was highly heterogenous within both the intervention and control areas. However, a substantial protective efficacy of IPTI (76%) was

observed in the two intervention districts of Ruangwa and Nachingwea following a year of IPTi delivery. The protective efficacy was not significantly different in the two arms regardless of the drug type. The control site had a marginal reduction in prevalence (18%). The observed effect of IPTI on anaemia was not statistically significant in comparing intervention and control districts.
Conclusions: The protective efficacy of IPTi on malaria is consistent with several randomized controlled trials. It is plausible that the protective efficacy of malaria across the villages we observed is attributed to the IPTI intervention with statistical significance. These findings draw further evidence on the suitability of the IPTI intervention as an additional tool to fight against malaria in high endemic areas. The use of the IVD platform has also proven to be very effective to house the implementational delivery of the IPTI intervention.

Intermittent Preventive Treatment for malaria as a useful tool for reducing malaria-related morbidities in school-aged children in Tanzania

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Background: In high malaria transmission settings, children of school age have become increasingly more vulnerable as they harbour malaria parasites without showing symptoms (asymptomatic), which may induce inflammation leading to anaemia, and consequently leads to impaired psychomotor and cognitive abilities. The study aimed to evaluate programmatic implementation of intermittent preventive treatment of malaria in schoolchildren (IPTsc) using Dihydroartemisinin-Piperaquine (DP), given three times a year, for evidence on the operational feasibility and effectiveness of IPTsc on clinical malaria incidence in a high endemic area in Handeni District Council (DC), Handeni Town Council (TC) and Kilindi DC of Tanga region, Tanzania.
Methodology: Prior to this study, we had conducted a clinical trial on IPTsc in Muheza DC (ClinicalTrials.gov, number NCT03640403), where IPTsc reduced malaria prevalence from 26% to 9% within one year, with a protective effect of 78% (95%CI 52-90, *p<001*), it also led to increase in haemoglobin levels among participating schoolchildren. The IPTsc study in Handeni and Kilindi districts was an effectiveness-implementation hybrid trial to assess the feasibility and effectiveness of IPTsc using DP against the standard of care (control) (Clinicaltrials.gov, registration number NCT04245033). In this study, three rounds of drug dispensing have been conducted (in Aug 2020, Nov 2020, and Mar 2021) covering around 127 schools with around 80,000 pupils involved.
Results: After the three rounds of IPTsc, the respective coverage of completed dose per district was; Handeni TC 83%, 77%, and 78%, Handeni DC 82%, 82% and 83%, and Kilindi DC 68%,69%, and 77%. The drugs were well tolerated by the schoolchildren. The attributable reduction of malaria parasitaemia across all districts was 62% and the effectiveness of IPTsc in preventing clinical malaria over the course of a year was 41% (p<0.001).

Conclusion: The two studies have shown that IPTsc reduces malaria parasitemia, restores malaria-related anaemia, feasibly implementable through schoolteachers, and was highly acceptable among parents and or guardians.

Dihydroartemisinin-piperaquine is effective as seasonal malaria chemoprophylaxis for prevention of malaria infection in extended seasonal transmission settings of Tanzania: An open cluster randomized clinical trial

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Background: Seasonal malaria chemoprophylaxis (SMC) strategy is recommended by WHO in Sahel and Sub-Sahel regions. Because of the current epidemiological changes in malaria transmission, there several regions in East Africa where the transmission pattern would suggest suitability of SMC. However, there is limited evidence of protective effectiveness of SMC in settings of Tanzania where there is an extended seasonal malaria transmission. This study, therefore, assessed the effectiveness of dihydroartemisinin-piperaquine (DHAPQ) as SMC for prevention of malaria in under-five children
Methods: Between March and June 2021 children aged 3-59 months in districts of Nanyumbu and Masasi, Mtwara region were enrolled in an open cluster randomized (intervention and control) study. Children in the interventional clusters were administered monthly with a full course of DHAPQ for three consecutive months regardless of the malaria infection status, whereas those in the control clusters were treated according to the Tanzania malaria treatment guidelines once they got infected. Two surveys were conducted (baseline – August 2020 and post-intervention – August 2021) where a finger-prick blood samples were collected from children in both interventional and control clusters and were used to test for malaria infection using malaria rapid diagnostic test (mRDT) and microscopy, and measurement of hemoglobin concentration using HemoCue spectrophotometer. Prevalence of malaria infection was the primary outcome.
Results: During the baseline survey: a total of 2,340 children, 1635 (69.9%) from Masasi and 705 (30.1%) Nanyumbu districts were screened for malaria parasites using both mRDT and microscopy. Overall, 373 (15.9%) were malaria positive by mRDT and 212/2330 (9.1%) by microscopy. The malaria prevalence by mRDT was significantly higher in Nanyumbu 23.7% compared to 12.6% in Masasi district, $p < 0.001$. Following the intervention, the overall malaria prevalence by mRDT declined significantly to 7.5% (x^2=74.8, p<0.001), whereby in Nanyumbu district it declined to 9.2% (x^2=48.07, p<0.001), while in Masasi it declined to 6.8%(x^2=29.5, p<0.001). Likewise, by microscopy in the interventional clusters' malaria prevalence declined to 5.8% whereas that in the control clusters was 9.26% (97/1048), p=0.003. About 54% (1196/2219) of the participants had anemia before the intervention; 53.1% were in the interventional and 54.6% in the control clusters (x^2=0.49, p=0.485). Following the intervention, anemia prevalence declined to 49.2% in the interventional clusters, whereas in the control clusters it increased

to 58.0%, (x^2=16.4, p<0.001). The DHAPQ was well tolerated with no serious adverse events. About 6% (60/1039) of the participants had adverse events after the intervention, and vomiting (29.6%), fever (23.4%) and abdominal pain (15.6%) were the major reported adverse events. All the adverse events were mild and self-limiting.
Conclusion: In this SMC study for under-five children using DHAPQ was safe and effective in reducing prevalence of malaria and anemia.

Symposium # 05:
Progress in elimination of Neglected Tropical Diseases (NTDs) in Tanzania
Organized by: NTD Control Programme (NTDCP) and National Institute for Medical Research (TAKeOFF Project)

The World Health Organization Road Map for Neglected Tropical Diseases 2021–2030: Will Tanzania achieve the target?
Presenting author: Dr George Kabona[1*], Programme Manager for NTD Control Programme
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Background: Tanzania is endemic with five Preventive Chemotherapy (PCT) targeted NTDs, namely, Schistosomiasis, Soil-transmitted Helminths (STHs), Lymphatic Filariasis (LF), Onchocerciasis and Trachoma. The country is also endemic with case management diseases such as Human African Trypanosomiasis (HAT), Rabies, Tick borne Relapsing fevers, Echinococcosis(hydatid), Taeniasis (cysticercosis), Rabies, Brucellosis, Plague, Leprosy and Snake bite. A large part of the population is at risk of co-infection with two or more of these diseases.
Objective: To assess whether Tanzanian NTDs control Program (NTDCP) can achieve the recommended targets by the 2021-2030 WHO NTD Road Map.
Methods: Conducted programmatic monitoring and impact assessment studies to realize successes and infection transmission levels after several years of interventions through Mass Drug Administration (MDA), WASH Interventions, Case Management, and behavioral change communication.
Results: Monitoring studies have demonstrated significant decline of burden for LF and trachoma whereby, in 2022, about 82% of people living in LF-endemic areas (equivalent to 28.9 million people) were no longer at-risk of the disease and approximately 90% of people living in trachoma-endemic areas (equivalent to 17.7 million people) were no longer at-risk of trachoma. Furthermore, the prevalence of onchocerciasis has declined from 45-95% in 1980s to 0 – 3.4% in 2022 in onchocerciasis endemic areas. Schistosomiasis and STHs control have shown noteworthy progress demonstrated by improved school attendance, improved academic performance, and reduced morbidity throughout the country. However, we have experienced implementation challenges such as inadequate funding, transmission hotspots, persistent and recrudescent diseases, unmapped diseases, and inadequate impact assessment contributing to delayed elimination of targeted diseases.
Conclusion: While Tanzania is at an outstanding position of achieving the WHO NTD Road Map 2021-2030 targets by eliminating at least one NTD, concerted efforts in multiple dimensions are underway to accelerate elimination process.

Transmission hot spots and their long-term impact on the effectiveness of larger scale Neglected Tropical Diseases Control and Elimination Programmes in Tanzania and other endemic countries.

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Background: Neglected tropical diseases (NTDs) poses a major public health problem in sub-Saharan Africa. Tanzania and many other countries in sub-Saharan Africa are known to have transmission hot spots for many NTDs including schistosomiasis, lymphatic filariasis (LF), trachoma, onchocerciasis, and others because they provide the natural ecology for different species of vectors which act as intermediate hosts.

The current WHO recommended control and elimination strategy for many NTDs is mass drug administration (MDA) using safe and efficacious drugs such praziquantel, albendazole, Ivermectin, Diethylcarbamazine, Azithromycin and others. This strategy has been effective in reducing prevalence and intensity of many NTDs. However, research evidence indicates that whereas MDA programs have reduced prevalence and intensity of NTDs in some areas, prevalence and intensity have remained high in other areas. These areas are known as "transmission hot spots". Factors responsible for occurrence of transmission hot spots include environmental and ecological conditions, abundance and infectivity of disease vectors, lack of adequate water, sanitation and hygiene infrastructure and socio-economic factors such as poverty. Other factors include resistance of parasites and vectors to drugs and insecticides used, differences in water contact activities or a lack of participation in MDA programs. The long-term impact of transmission hot spots is that large scale NTD control programs may not be able to achieve control and elimination goals and targets set by WHO as it has been observed in Zanzibar and other African countries. Hotspots can be addressed through number of approaches including test and treat with recommended therapies for people who are still positive for infection despite ongoing interventions to halt transmission.

There is an urgent need to identify transmission hot spots in order to plan and implement integrated high impact disease specific interventions. Further operational research is needed to generate more knowledge on factors that contribute to the occurrence of transmission hot spots, how to identify them and on enhanced interventions that address them.

Twenty-five years of MDA using ivermectin to control onchocerciasis in Mahenge, an area endemic for epilepsy: Where do we stand?

Presenting author: *Bruno P Mmbando[1*]*

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Background: Onchocerciasis is a parasitic disease caused by *Onchocerca volvulus* and it is estimated to affects 37 million people worldwide, of whom 99% live in Africa. The disease was enlisted by WHO for elimination by 2025 using ivermectin. Epilepsy, a neurological disease characterized by unprovoked seizures is associated with onchocerciasis, although the causative mechanism is not yet understood. This study was aimed to determine the prevalence of onchocerciasis and epilepsy following long-term use of ivermectin in control of onchocerciasis in Mahenge area.
Methods: The study was conducted in four and 34 villages in 2017 and 2021, respectively. Door-to-door household's visits were implemented to enumerate population, screen for suspected epilepsy cases, and confirm their status, and children aged 6-10y were tested for onchocerciasis antibodies using an OV16 rapid tests. Clinical, neurological and laboratory examinations were performed at central point in each village. In two villages, epilepsy surveillance system to improve awareness on epilepsy and onchocerciasis and reduce anti-epileptic treatment gap were introduced in 2019.
Results: During 2017 survey, 5160 individuals (median age 18.5y, 47.8% male) were registered and 58,000 in 2021. In 2017, children tested positive for OV16 were 530 of which 20.7% tested positive. Prevalence of OV16 was significantly high in two rural villages (38.4%) compared to two sub-urban (3.7%), p<0.001. In 2021, prevalence of OV16 was 12.3% (494/4004) with rural villages been mostly affected. Reported MDA coverage in 2017 was 74.4% while in 2021 was 80.4%. Prevalence of epilepsy in 2017 was 20.4 per 1000 persons, with rural village having higher prevalence (28.4 vs. 13.2 per 1000), p<0.001. Overall, prevalence of OV16 in the two rural decreased from 38.4% in 2017 to 24.3% in 2011, p<0.001. In the two- sub-urban villages, there was not significant different change between 2017 and 2022 (3.7% vs. 5.3%, p=0.528). In all surveys, there was high correlation between the prevalence of epilepsy and onchocerciasis.
Conclusion: Despite use of ivermectin for about 25 years, the prevalence of onchocerciasis and epilepsy remains high with the villages in remote settings been the most affected. The findings suggest community interventions to complemented mass drug administration using ivermectin.

The role of research in promoting interventions for diseases beyond the five NTDs under preventive chemotherapy in Tanzania

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Background: Tanzania has made an appreciable progress in the control and elimination of Neglected Tropical Diseases (NTDs) under preventive chemotherapy (PCT). The NTDs include; Lymphatic filariasis, schistosomiasis, trachoma, onchocerciasis, and soil transmitted helminthiasis. While a focus has been on the five NTDs, there is growing evidence that several other NTDs exists and cause debilitating health challenges to the population. Some of these include; snakebite envenoming, leishmaniasis, rabies, taeniasis and cysticercosis, dengue and chikungunya. Recently, we have started researching on snakebite envenoming with a focus on determining gaps related to access and delivery of antivenom at the subnational levels. The ultimate goal is to raise the awareness on the existence of

a life-threatening health challenge beyond the five NTDs, and advocate for an increased access to and delivery of antivenoms to save lives.
Objective: The main goal of the project was to raise awareness and knowledge about the snakebite envenoming problem and the challenges related to access to and delivery of antivenom at the primary healthcare level in Tanzania.
Methods: This was a Cross-Sectional Study involving Regional and District NTD Coordinators working in groups and participating in plenaries to identify gaps and bottlenecks on access and delivery of interventions for snakebite envenoming in Tanzania.
Results: A total of 17 gaps and 7 Bottlenecks were identified. These were categorised into two groups, i) gaps and bottlenecks related to provision of healthcare services on snakebite envenoming, and ii) gaps and bottlenecks related to communities' utilization or access to antivenoms. Lack of reliable data on snakebite envenoming, poor supply chain for antivenoms, limited multisectoral collaboration in addressing snakebite envenoming and low awareness on the availability of antivenoms at the health facilities are among the gaps identified during the workshop.
Conclusion: Research on snakebite envenoming is highly needed to support advocacy for an improve access to and delivery of antivenoms, particularly in the rural areas. Further research on the epidemiology of snakebite envenoming is needed to better inform planning for interventions on this health challenge.

Round table discussion
An integrated approach for improving health services for chronic respiratory diseases in Tanzania
Moderator: Elizabeth H Shayo[1*]
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Background: Chronic respiratory diseases (CRDs) are yet to be addressed within the Tanzanian health system. The baseline assessment indicated that CRDs are given low priority because of limited data despite their impacts. The TB programme reported TB negative clients without further pathways within the health system hence limited access to care.
Objective: To develop, implement, monitor, and evaluate a context specific intervention to manage CRDs within the health system.
Method: The study was implemented in Chamwino district, Dodoma region. Implementing facilities included five health centres and two hospitals. Training was provided to health facility and community health workers (CHWs) on CRDs management. Training materials were developed, data capturing tools updated, patient pathway and algorithm developed, and diagnostic tools purchased thereafter distributed to the health facilities. Monitoring was done on a monthly and quarterly basis.
Findings: For the six months follow-ups, 601 presumed CRD cases were referred to the clinic of which 471 were evaluated using supplied equipment. A total of 74 clients had chronic obstructed pulmonary disease (COPD), 336 chronic asthma, 32 post TB lung disease (PTLD) and 29 other CRDs. Health workers gained the ability to differentiate TB from CRDs such as COPD, PTLD and Asthma due to the

corresponding training and equipment availability. They also reported a decreased trend of recurrent cases of Asthmatic attack to patients. CHWs reported happiness with this intervention because TB negative clients could get treatment. Patients reported improvement in symptoms due to medication and some of them resumed to their normal activities.

Conclusion: Management of CRDs appears to be possible. Cases of COPD, Chronic Asthma, PTLD and other CRDs have been diagnosed that were previously not properly done. Integration of CRDs diagnosis and care into the TB programme and strengthening linkages with CHW is feasible and acceptable, however better plans are needed for the sustainability.

Summary on sessions on Molecular Surveillance of Malaria in Tanzania (MSMT)

Despite scaling-up of different interventions over the past 20 years, malaria is still a main cause of morbidity and mortality globally leading to over 241 million cases and 627,000 deaths in 2020. It continues to be a public health threat affecting human health, socio-economic and wellbeing of majority of the people in most of the countries especially in Sub-Saharan Africa (with over 95% of cases and deaths), including Tanzania.

About 93% of the population in Tanzania, lives in areas where malaria transmission occurs, but some areas are transitioning from control to the elimination stage. Throughout the country, malaria burden has recently declined due to implementation of different interventions and some parts have remarkably high to moderate while others have low to exceptionally low transmission intensity.

In order to eliminate malaria by 2030, the National Malaria Control Programme (NMCP) developed and is implementing a National Malaria Strategic Plan (NMSP) of 2021-2025. This NMSP stratifies malaria burden at the council level and outlines different packages of interventions for each stratum to enhance the ongoing elimination strategies. Thus, going forward, malaria interventions in Tanzania will be deployed based on the area-specific disease burden, with the aim of reducing the burden in high and moderate areas, and eliminating malaria in areas with low and exceptionally low transmission intensity. This will require promoting surveillance to be a core intervention as recommended by the World Health Organization.

Under the current situation, it is critical to explore the application of innovative technologies such as malaria molecular surveillance (MMS) which is based on next generation sequencing (NGS) and bioinformatics to support detection, monitoring and control/elimination of malaria. These innovative tools are urgently needed to strengthen the current diagnostic and surveillance systems, which are based on traditional methods. Thus, it is important to build the MMS capacity for in-country generation and analysis of data as well as utilization of the findings for policy and decision making.

The ongoing efforts to deploy these tools for malaria detection and molecular surveillance have highlighted the potential opportunities presented by these innovative technologies as well as challenges in adopting them. Deployment of NGS, bioinformatics and related technologies will also offer an opportunity to broadly build in-country capacity in pathogen genomics and bioinformatics, and to effectively engage with multiple stakeholders as well as policy makers.

Overall, these ongoing initiatives are critical and need to be urgently supported by the Government and other stakeholders to build MMS capacity of Tanzanian researchers and their institutions and allow them to generate genomics data and perform bioinformatics analysis in-country. This will provide critical information that will be used for real-time policy and decision-making to support malaria elimination in the country. The session covered dissemination of ongoing project activities. The event was culminated with the launch of the Malaria Genomic Surveillance Laboratory at NIMR Headquarters which was officiated by the Chief Medical Officer from the Ministry of Health Dr Aifelo Sichwale.

Chapter 3: Conference recommendations

Among the key outputs of the conference were generating action-oriented recommendations to improve policies, programs, and practices for targeting health promotion. It is envisaged that the recommendations will provide guidance, stimulate policy, and practice orientations at various levels of the health system in order to improve health service deliveries.

The priority recommendations were:

1. Health Research Users` Trust Funds (HRUTF) should endure functioning as a distributor of a pool of funds through NIMR in collaboration with the Ministry of Health and partners to support priority health research areas.
2. The Ministry of Health need to institutionalize the National Health Research Agenda (NHRA) and its implementation be monitored through the joint annual health sector review and policy meetings to bridge the gap between research and policy.
3. The Ministry responsible for environment need to prioritize policies and strategies to mitigate the effects of climate change and increase investment in environmental sustainability e.g., renewable energies, to address the negative effects on health outcomes.
4. The Government through Ministry of Health needs to increase investment on research and development on traditional medicines across the value chain up to commercialization.
5. The Ministry of Health and other sectors need to strengthen preparedness and response to enable comprehensive national public health response during emerging and re-emerging infectious diseases.
6. The national disease control programs and primary health care units should scale-up multi-morbidity management and disease preventive strategies to reduce the disease burden and improve livelihood across the lifespan through essential packages of Universal Health Coverage.
7. Prime Minister`s Office needs to institutionalize a multisectoral framework for Non-Communicable Diseases and other chronic diseases to enable effective implementation of strategies to effectively address social determinants of health.
8. Researchers need to tie up their professional and research pursuits guided by rules, regulations, and guidelines.

General conclusion

The establishment of NIMR was in recognition by the government of the need to generate scientific information required in the development of better methods and techniques of enhancing disease management, prevention, and control in the country. Since then, there has been improvement in the dissemination of research findings. Apart from the AJSC, NIMR disseminates general information on health as generated from diverse research conducted in the country through other for a such as its quarterly published ***Tanzania Journal of Health Research***. The Journal, established in 1997, is available on-line since 2007.

It is important for the Ministry of Health to incorporate into its structure and function the national research agenda, enhance its implementations, develop a monitoring and evaluation plan through regular joint evaluations. Based on the recently observed impact resulting from the use of traditional remedies in the fight against infectious diseases, the Government needs to significantly invest on traditional medicine research and infrastructure to enhance the realization of commercial-based policy, product, and practice for sustainable service delivery. Basing on the conference main theme,

the Ministry of Health and other sectoral ministries may have to consider incorporating into their structures and functions a multi-sectoral framework that address one health approach in order to control infectious and non-infectious disease conditions.

References

1. http://www.nimr.or.tz/
2. UNFCCC (2022) United Nations Framework Convention on Climate Change; Climate change: impacts, vulnerabilities, and adaptation in developing countries.
3. Joacim R et al (2020)Climate change: an enduring challenge for vector-borne disease prevention and control
4. WHO (2022); https://www.who.int/health-topics/health-financing#tab=tab_1
5. WHO (2021); Noncommunicable diseases
6. https://www.un.org/sustainabledevelopment (United Nations Sustainable Development Goals)
7. https://www.acteast.org/where-we-work/tanzania (ActEast@rti.org (2019)
8. Gurib-Fakim, A. (2006) Medicinal Plants: Traditions of Yesterday and Drugs of Tomorrow. Molecular Aspects of Medicine, 27, 1-93. http://dx.doi.org/10.1016/j.mam.2005.07.008
9. G Bodeker, F Kronenberg (2002); A public health agenda for traditional, complementary, and alternative medicine, American journal of public health 2002 - ajph.aphapublications.org