Progress in Building Capacity for HIV/AIDS Implementation Science in Tanzania – the HIS Project

PI's: Muhammad Bakari & Christopher Sudfeld

Co-PI's: Wafaie Fawzi & Ferdinand Mugusi

HIV Implementation Science (HIS) Project Training Program Goals

In Tanzania, to:

1. train a critical mass of mid-level and senior researchers to lead implementation science research (Postdoctoral Fellowships)

2. build a critical mass of junior public health professionals who can design and carry out rigorous research projects in HIV Implementation Science (Masters and Ph.D. Fellowships)

3. develop a new Ph.D. program in Implementation Science at MUHAS

Postdoctoral Fellows: (2 yrs with ~9 months in Boston)

SN	Name	Year	Research Topic/Area
1	Pilly Chillo	2022	Hypertension among PLHIV in Southern Tanzania: Exploring the Care Cascade, and Opportunities for Intervention
2	Grace Shayo	2023	Implementation of Isoniazid preventive therapy among PLWHIV
3	Patricia Munseri	2024	Facilitators and Barriers to oral Pre-Exposure Prophylaxis for HIV among Female sex workers

PhD Fellows: (1 yr with ~4 months in Boston)

SN	Name	Year	Topic
1	George Bwire	2022	Assessing the feasibility of combining microfinance and peer support intervention to improve HIV health outcomes for HIV-positive individuals living in the urban settings; in relation to preventing HIV-1 drug resistance
2	Prosper Njau	2022	Trend, pattern, and predictors of HIV-1 viral suppression among PLHIVs in Tanzania using population-based large-scale surveys
3	Wigilya Mikomangwa	2024	Exlploring the acceptability and preferences for different PrEP dosing regimens among women at high risk of HIV in Tanzania

Summer Fellows: (1 yr with 2 months in Boston)

SN	Name	Year	Topic
1	Mashavu Yusuf	2023	Malnutrition among adolescents aged 10 – 19 years living with HIV in Tanzania: trends and associated factors from 2013 - 2023
2	Belinda Njiro	2023	Alcohol use and treatment outcomes among people living with HIV in urban Tanzania
3	Christopher Mbotwa	2023	Effectiveness of mHealth intervention on early retention in HIV PrEP program among female sex workers in Tanzania
4	Wigilya Mikomanga	2023	Evaluation of long-term retention of PrEP care against HIV among female sex workers in Tanga, Tanzania
5	Rahma Muhammad	2024	Predictors and outcomes of gestational weight gain among HIV positive pregnant women in Tanzania
6	Happiness Saronga	2024	Cost-effectiveness of routine HIV drug resistance testing for management of 1st line treatement failure in Tanzania
7	Suleiman Chombo	2024	Trend analysis and factors associated with attitudes towards usage of PrEP among adolescents in Tanzania
8	Kilaye Karino	2024	A qualitative study exploring barriers and facilitators in providing mental healthcare for depression and anxiety symptoms in adolescents living with HIV in Northern Tanzania
9	Amani Kway	2024	Unlocking Approval: Exploring Socio-Demographic Influences on HIV Pre-Exposure Prophylaxis (PrEP) Acceptance Among Sexually Active Adults Aged 15-49 in Tanzania Using 2022 DHS Insights

Fellowships for 2025

Advertisement has been made – a number of applicants received already

SN	Fellowship	Slots
1	Post Doc	**02**
2	PhD	**01**
3	Summer	**03**

MUHAS Short Courses

Facilitators from:

- Harvard TH-CHAN
- PCOR (Northwestern Univ)
- MoH
- MNH
- MDH
- AAPH
- UDSM
- MUST

Programmatic Knowledge
1.1 HIV-affected Children - **Completed Aug 2024**
1.2 HIV in Adolescents - **Completed March 2023**
1.3 HIV, Nutrition, and Non-communicable Diseases - **Completed Nov 2023**
Advanced Implementation Science Methods
2.1 Advanced Implementation Science and Program Evaluation - **Completed Oct 2024**
2.2 Qualitative Research in Implementation Science
2.3 Health System Strengthening - **Completed June 2023**
2.4 Improving the Quality of Health Services
2.5 Data Science for Implementation Science Research
Career Development
3.1 Research Ethics in Implementation Science
3.2 Bioethics for Adolescent and Child HIV Research
3.3 Scientific Manuscript Development - **Completed Jan 2023**
3.4 Proposal Development - **Completed in March/April 2024**

PhD Program in Implementation Science at MUHAS

- **Goal:** to develop advanced-level Implementation Science (IS) curriculum/training guideline and appropriate courses at MUHAS

- **Progress:**
  - Developed a PhD training Guideline in IS that is in line with the MUHAS's PhD training Framework
  - Draft being reviewed at the School of Public Health and Social Sciences (SPHSS)
  - Eventually to have it approved at the MUHAS administrative levels

Acknowledgements

Partners

Government of Tanzania through the Ministry of Health

Management and Development for Health (MDH); Africa Academy for Public Health (AAPH); MUHAS Administration & Faculty; Muhimbili National Hospital (MNH)

Fellows

Post-Doc, PhD and Summer

NIH Funders

Office of AIDS Research

Fogarty International Center

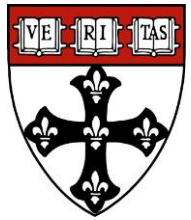
Eunice Kennedy Shriver National Institute of Child Health & Human Development

National Institute of Mental Health

Keynote Speech January 2025

Karim Manji .Professor Emeritus –MUHAS

On behalf of Deputy Vice Chancellor-research and Consultancy Prof. Bruno F Sunguya MUHAS



Global burden of micronutrients deficiency

- Maternal and child micronutrient deficiencies affect approximately half of the world's population, low- and middle-income countries (LMICs) carry the biggest burden
  - Inadequate dietary intake and limited diversity of fruits, vegetables, animal protein and fortified foods are among the contributing factors
  - In women, the deficiency worsens during pregnancy because of increased demands of both the mother and the growing fetus.
- Iron, folate, vitamin A, iodine and zinc are the most widespread micronutrients deficiencies, affects almost one third of the world's population.
- Micronutrient deficiencies account about 7.3% of the global burden of disease.
- Iron deficiency anemia results in 25 million DAILYs lost, vitamin A deficiency in 18 million DAILYs lost, and iodine deficiency in 2.5 million DALYs lost

[Karger AG 2013; WHO, 2016]

The problem

Anemia Prevalence, 2011
Among Women of Reproductive Age

Global Prevalence

- Women: 29% (496 mil)
- Pregnancy: 38% (32 million)

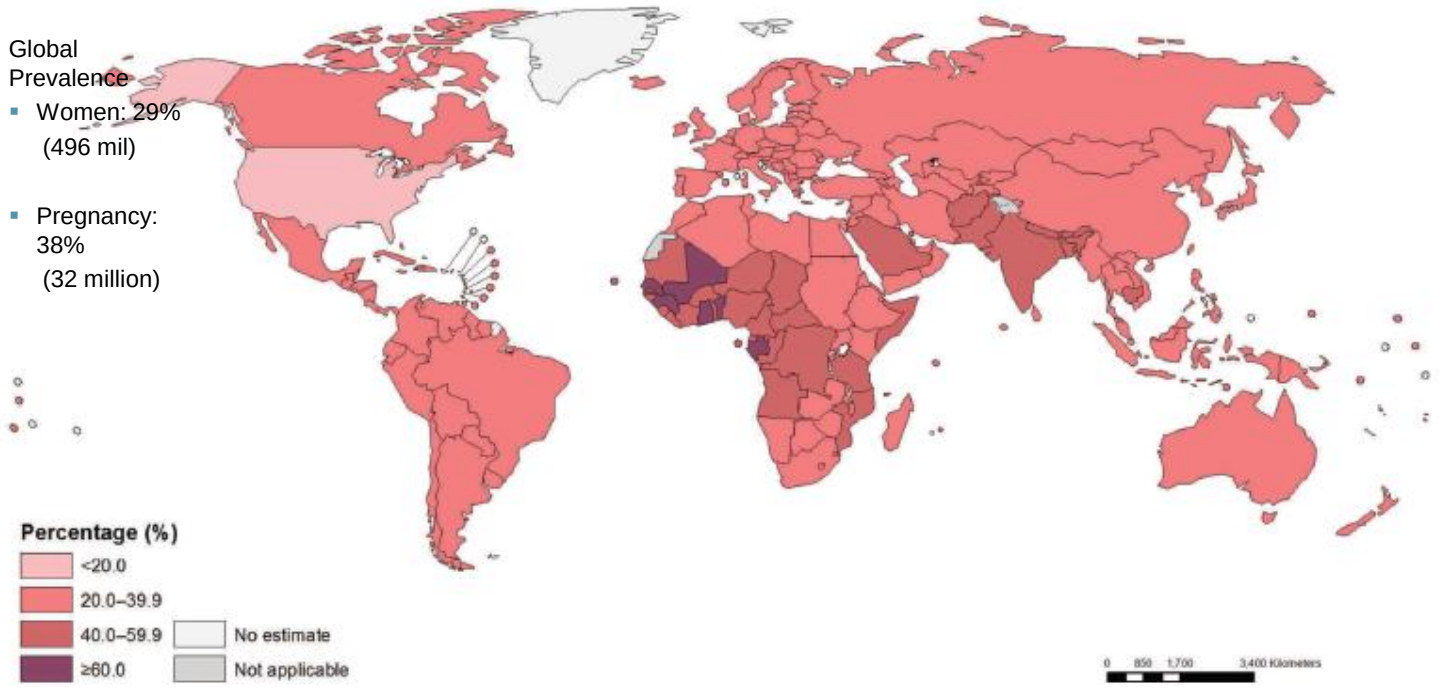
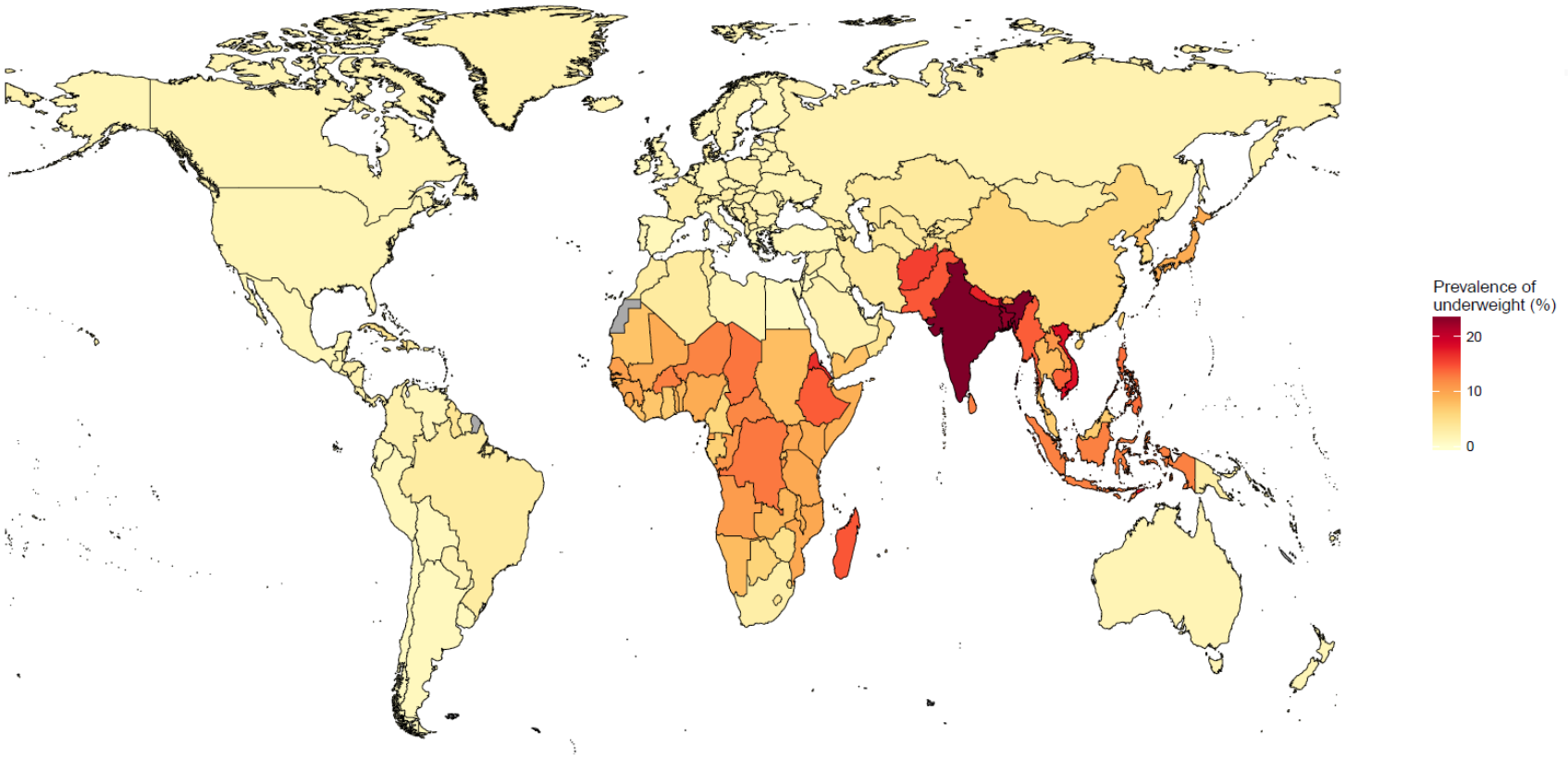


Figure 9 Global estimates of the prevalence of anemia in pregnant women aged 15–49 years, 2011. Reprinted with permission from WHO [262]. Copyright WHO (2015).

Underweight (BMI<18.5): WOMEN AGES 15-45 Y



Global Burden of Maternal Undernutrition

NCD Risk Factor Collaboration, Lancet 2016

Overview of Nutritional Disorders in Tanzania

Child Malnutrition

- Stunting: 31.8% of children under five.
- Wasting: 3.5% of children under five.
- Underweight: 14% of children under five.
- Overweight: 2.8% of children under five.

Micronutrient Deficiencies

- Anemia affects 58% of children (6–59 months) and 45% of women of reproductive age.

Adult Overweight and Obesity**

- 15.2% of adult women and 5.0% of adult men are obese.

Sources: Global Nutrition Report, USAID, Tanzania Food and Nutrition Centre

Regional Variations and Contributing Factors

Regional Variations

- Stunting prevalence ranges from 15.1% to 45.2% depending on age and region.

Contributing Factors

- Poor dietary diversity and inadequate infant feeding practices.
- Limited access to healthcare and WASH (Water, Sanitation, Hygiene) facilities.

Challenges and Progress

- High rates of malnutrition persist despite reductions in stunting and underweight.
- Emerging issues of overweight and obesity add new challenges.

Sources: TFNC, USAID, Global Nutrition Report

Topic	Key Details	Source
HIV Prevalence in Tanzania	4.4% prevalence among adults; approx. 1.55M cases.	[Tanzania HIV Impact Survey 2022-2023](https://nbs.go.tz)
Stigma and Discrimination	Eliminating stigma remains a challenge.	[UNAIDS](https://unaids.org)
Mother-to-Child Transmission (MTCT)	Ongoing efforts to reduce and eliminate MTCT.	[UNAIDS](https://unaids.org)
Youth Vulnerability to HIV	HIV prevalence higher among young women (1.4%).	[UNAIDS](https://unaids.org)
ART Coverage	97.9% diagnosed adults on ART; 82.7% aware of status.	[PHIA Tanzania](https://phia.icap.columbia.edu)
Funding and Sustainability	Heavy reliance on external donors.	[UNAIDS](https://unaids.org)
TB and HIV Co-Infections	Challenges managing TB among people living with HIV.	[Swiss TPH](https://swisstph.ch)
Data Collection and Monitoring Systems	Need for better tracking and planning systems.	[UNAIDS](https://unaids.org)

Prof. Andrea Pembe_Improving women and Adolescents' health and Nutrition

Dr. Mashava Yussuf_Improving nutrition and health among school aged children

Dr. David Sando_Improving access to HIV Prevention Services for Adolescents

Dr. Alfa Muhihi_Use of Nutritional Supplements During Pregnancy

Dr. Germana Leyna_IMAN Project

Prof. Christopher Sudfeld_Improving Women and Adolescents' Health & Nutrition

Prof. Wafaie Fawzi_Harvard-Tanzania

Trial of Micronutrients and Adverse Pregnancy Outcomes (NIH) Fawzi W., Msamanga G, Urassa W TOV

The TOV study!!!

1. To determine if multivitamin tablets given to women on a daily basis during the prenatal period help) to decrease the serious problems of: 1) fetal loss (spontaneous abortions and stillbirths), 2) low birth weight (<2,500 g), and 3) preterm birth (<37 weeks)
2. To determine if multivitamins tablets given to women on a daily basis during breastfeeding help to improve early child health (as measured through mortality and morbidity)

Concluded and various ground-breaking research findings have been published.

A Pilot Trial of Zinc Supplements among HIV-infected Pregnant Women in Dar es Salaam (NIH)PIs: Fawzi, Mugusi

- *(Zinc vs. placebo)*To determine whether the oral administration of zinc supplements to HIV positive women during and after pregnancy improves the level of hemoglobin and immune status among the supplemented group compared to the placebo groupHIV-positive pregnant women and their children (300)
- Completed study. Results published.

Partnership on Nutrition and HIV/AIDS Research in Tanzania: Exploratory Study on Selenium in HIV Infection (NIH)

Fawzi W., Mugusi F

Purpose: To study role of selenium in HIV pregnant women improves their health and the outcome of the offspring.

Specific Objectives:

1. To determine whether the oral administration of daily selenium supplements to HIV-1 positive pregnant women enhances immune status at 6 months postpartum measured using CD4 cell counts;
2. Reduces the HIV-1 viral load at 6 months postpartum;
3. Reduces the risk of lower genital shedding of HIV-1 infected cells at 36 weeks of gestation; and
4. Reduces the risk of mastitis as defined by elevated sodium concentrations in breast milk at 6 weeks postpartum

HPTN 024: Phase III trial of antibiotics to reduce chorioamnionitis–related perinatal HIV transmission *(Antibiotics vs. placebo)* (DAIDS, NICHHD)PIs: Fawzi, Msamanga, Manji.

- To determine if low-cost antibiotic treatment given twice during pregnancy aimed at reducing chronic and acute chorioamnionitis will reduce perinatal HIV transmissionHIV-positive and HIV-negative pregnant women and their children .

DSMB decided to discontinue in Feb 2004 for scientific reasons.

Manuscript have been prepared and submitted.

Comparison of two multivitamin dosage regimens in the prevention of adverse pregnancy outcomes among HIV-positive women from Tanzania (NIH)
Fawzi W, Msamanga G TOV2

Purpose: To examine the effects of multivitamin supplements (including B, C, and E) administered daily to HIV-positive women during pregnancy at doses resembling the Recommended Dietary Allowance (RDA) decreases the risks of low birth weight (<2500 g), and preterm birth (<37 weeks), compared to multivitamin supplements at doses above the RDA level

Data analysis. Early closure due to lack of funds.

Vitamins, Breastmilk HIV Shedding, and Child Health
Aboud S, Villamor E TOV-Breast Milk

Purpose: To examine the effects of vitamin supplementation administered to HIV-infected women during pregnancy on a number of immunological and virological parameters in breastmilk

Specific Objectives:

- 1. To determine the immunological properties such as cytokines, interleukines and other markers
- 2. To determine viral loads/markers

Effect of Zinc Supplementation on Pneumonia in Children (National Institute of Allergic and Infectious Diseases –NIAID)

Fataki M., Fawzi W

Purpose: To determine whether oral zinc supplementation (plus standard antibiotics) significantly alters the duration of required hospitalization in children six to 36 months of age, who are hospitalized with radiologically confirmed acute pneumonia

Specific objectives:

1. Recovery rate in terms of duration of hospitalisation.
2. Outcomes in terms of mortality and recurrence of pneumonia

2003-2007

Study stopped.

Nutrition, Immunology, and Epidemiology of Tuberculosis (International Collaborations in Infectious Diseases Research - ICIDR)
Fawzi W, Mugusi F TB study

Purpose: To examine the efficacy of micronutrient supplements on sputum and culture negativity, survival, and tuberculosis relapse and re-infection

Status:Completed.

Adult men and women with tuberculosis (60% HIV-positive, 40% HIV-negative) (887)

Manuscripts submitted and some more in preparation.

Effect of Multivitamins Supplements on Clinical and Immunological response in Childhood Tuberculosis (National Institute of Allergic and Infectious Diseases – NIAID)

Mugusi F., Fataki M., Fawzi W

TB2

- Purpose: To evaluate the efficacy of a multivitamin supplement containing vitamins B, C and E on weight gain in childhood tuberculosis at two months after start of anti-tuberculosis therapy; to compare treatment arms with respect to immunological markers (e.g., HIV viral load, CD4 counts), and examine the utility of immune response parameters as surrogate markers for treatment efficacy in tuberculosis.
- Status: Study stopped.

Trial of Micronutrients and Adverse Pregnancy Outcomes NIH. Fawzi, Msamanga, Urassa **PNS**

(Multivitamins (B,C,E) vs. placebo)

Purpose: To determine if multivitamin tablets given to women on a daily basis during the prenatal period help to decrease adverse pregnancy outcomes.

Specific Objectives:

1) fetal loss (spontaneous abortions and stillbirths),

2) low birth weight (<2,500 g), and

3) preterm birth (<37 weeks)2. To determine if multivitamins tablets given to women on a daily basis during breastfeeding help to improve early child health (as measured through mortality and morbidity)HIV-negative pregnant women and their children

Status: Completed. Main finding published NEJM. Other manuscrit manuscripts ongoing.

Trial of Vitamins among Children of HIV-infected Women (National Institute of Allergic and Infectious Diseases - NIAID)
Fawzi W, Manji K., Duggan C CHILD1

Purpose: To examine the effects of micronutrient supplementation on morbidity and mortality outcomes among infants born to HIV-positive women

Specific Objectives:

1. To determine whether MV suppl will reduce incidence of respiratory and diarrhea illness
2. To determine if MV will reduce mortality
3. To determine whether MV will improve and maintain growth
4. Whether MV will reduce MTCT of HIV
5. Whether Breast Feeding depletes the mother

Status: Completed Randomization in November- 2387 mother-baby pairs. Almost 1300 discharged. Follow-up ongoing, expected close-down mid-2008.

2003-2008

Body composition among pregnant Tanzanian women: The role of HIV infection (International Atomic Energy Association - IAEA)

Kupka R, Manji K, Duggan C Fawzi W

Child1-substudy

Purpose:

To study the measurement of Body composition using Deuterium and BIA

Specific objectives.

1. To measure total body water using deuterium dilution among two groups of pregnant women (i.e., HIV-positive and HIV-negative) matched for gestational age.
2. To validate the use of Bioelectric Impedance Analysis as a measure of body composition during pregnancy

Status: 30 HIV positive and 30 HIV negative pregnant women were recruited. Study completed. Last batch of urine specimen are expected to be shipped to Bangalore by end of this month.

Ancillary study.

A Trial of Zinc and Micronutrients in Children (NIAID)
Duggan C., Manji K CHILD 2

Purpose: To determine whether the oral administration of zinc and/or a micronutrient supplement (including vitamins C, E, B1, B2, niacin, B6, folate, and B12) to Tanzanian infants and children improves child health.

Specific Objectives;

1) reduces the incidence of diarrheal and respiratory illnesses.
2) results in improved growth (weight and length for age Z scores) compared with placebo

- Status : Ongoing. Over 130 randomized.
- 2006-2011

HPTN 046: A Phase III Study to Determine the Efficacy and Safety of an Extended Regimen of Nevirapine in Infants Born to HIV-positive Women to Prevent HIV Transmission During Breastfeeding (National Institutes of Health, NIH) Fawzi W., Manji K Msamanga G,

- Purpose: To assess if nevirapine administered to children of HIV-positive women throughout breastfeeding for six months (or until cessation of breastfeeding) reduces mother-to-child transmission of HIV *via* breastfeeding compared to placebo

Status: Site activation initiation is awaiting the Lab preparedeness. Expected to be activated in June, 2008

A Trial of Vitamins and HAART in HIV Disease Progression (National Institute of Child Health and Human Development - NICHHD)

Fawzi W., Mugusi F

TOV3

Purpose: To examine the effects of multivitamins (including B, C, and E) on HIV disease progression among HIV-positive Tanzanian adult men and women taking highly active anti-retroviral therapy (HAART)

Specific:

1. clinical response and progression
2. Immunological response and progression

Status: Data cleaning.

Innovative Approaches to Groups Counseling with HIV-positive Women (National Institute of Mental Health - NIMH)

Fawzi W, Fawzi MC, Kaaya S, Mbwambo J

MINI

Objectives:

1. To compare the effectiveness of this innovative group counseling program with individual supportive counseling (standard of care) among women infected with HIV in Dar es Salaam, Tanzania.
2. To implement and evaluate an interactive group HIV education approach to HIV pre-test counseling and follow-up counseling for women who have tested HIV-positive to improve: 1) acceptance of HIV testing and return for testing results; and 2) safe disclosure of serostatus to significant others
3. To examine the extent to which the intervention reduces depressive symptomatology and increases perceived social support in this population

Completed: Several manuscripts completed/near completion.

- The effects of closed group supportive counseling on levels of distress (depression) and perceived social support during pregnancy in women living with HIV/AIDS
- The effects of closed group supportive counseling on reported HIV sero-status disclosure in pregnant women living with HIV/AIDS
- Assessing the mediating effects of disclosure and personal worry over sero-status on levels of distress during pregnancy
- A description of the process of disclosure amongst pregnant women living with HIV/AIDS

Depression and Progression of HIV/AIDS
Fawzi W, Fawzi MC, Kaaya S, Mbwambo J
MINI 2

Purpose: To study role of depression in HIV diseases.

Specific Objectives;

1) To determine if depressive symptomatology among HIV-positive women at baseline is associated with faster progression of HIV, poorer quality of life, and greater disability at follow-up;
2) To assess the occurrence of HIV-related symptoms and negative social consequences of HIV-positive test result notification, such as domestic violence, at baseline in relation to depressive symptoms at follow-up;
3) To examine the association between HIV serostatus notification and the occurrence of depressive symptoms; and
4) To validate depression screening instruments for use in Tanzania. Measures include the depression sub-scale of the Hopkins Symptom Checklist-25 (Mollica et al., 1986), the Mental Health Inventory (MHI-5) from the SF-36 (Ware et al., 1986), and a 2-item depression screener developed by Rost et al. (1993).

Status Completed.

TOV5 study. Maternal vitamin D3- maternal health, birth outcomes, and infant growth among HIV-infected Tanzanian pregnant women.

Placebo-controlled trial of maternal vitamin D3 (cholecalciferol) supplementation conducted among 2300 HIV-infected pregnant women receiving triple-drug ART under Option B+ in Dar es Salaam, Tanzania. HIV-infected pregnant women of 12-27 weeks gestation are randomized to either: 1) 3000 IU vitamin D3 taken daily from randomization in pregnancy until trial discharge at 12 months postpartum; or 2) a matching placebo regimen.

Trials. 2017 Sep 4;18(1):411. doi: 10.1186/s13063-017-2157-3.

Sudfeld CR, Manji KP, Duggan CP, Aboud S, Muhihi A, Sando DM, Al-Beity FMA, Wang M, Fawzi WW.

- Maternal enrollment is complete. Following the birth of children and then upto 12 months ongoing
- Ongoing

AAPH 2nd Strategic Plan Launching by Hon. Ummy Mwalimu – MP and Tanzania Minister of Health. This 2022 – 2026 strategic plan aims to improve and streamline priority research, training, and public health policy advocacy in order to best serve our clients - the community. It sets clear and specific goals for the time period while addressing limitations and setting a stage for excellence.

Overview of Nutritional Disorders in Tanzania

Child Malnutrition

- Stunting: 31.8% of children under five.
- Wasting: 3.5% of children under five.
- Underweight: 14% of children under five.
- Overweight: 2.8% of children under five.

Micronutrient Deficiencies

- Anemia affects 58% of children (6–59 months) and 45% of women of reproductive age.

Adult Overweight and Obesity**

- 15.2% of adult women and 5.0% of adult men are obese.

Sources: Global Nutrition Report, USAID, Tanzania Food and Nutrition Centre

Regional Variations and Contributing Factors

Regional Variations
- Stunting prevalence ranges from 15.1% to 45.2% depending on age and region.

Contributing Factors
- Poor dietary diversity and inadequate infant feeding practices.
- Limited access to healthcare and WASH (Water, Sanitation, Hygiene) facilities.

Challenges and Progress
- High rates of malnutrition persist despite reductions in stunting and underweight.
- Emerging issues of overweight and obesity add new challenges.

Sources: TFNC, USAID, Global Nutrition Report

THANK YOU !!

We are one !!

For better public health

Africa Academy for Public Health (AAPH)

HIV implementation Science Symposium

17th January 2025

For better public health

Africa Academy for Public Health

Research | Training | Practice

Vision

To be the premier provider of innovative public health research and health systems training activities for the benefit of our community.

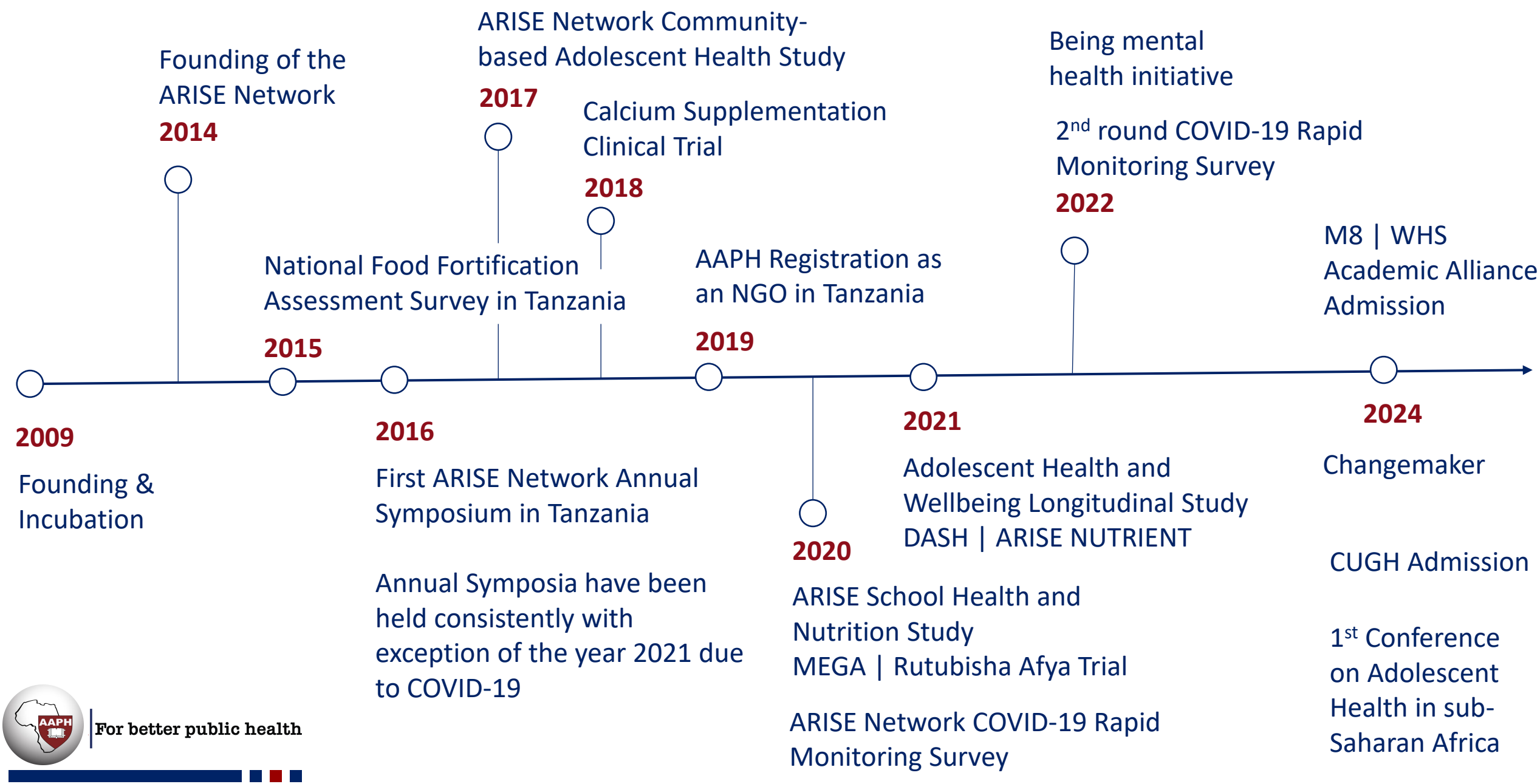
Mission

To advance public health priorities through innovative research, training, capacity building and knowledge translation.

Values

Honesty | Professionalism | Accountability | Integrity

15 YEARS TIMELINE



For better public health

LOCATION | TANZANIA FOOTPRINT | THEMATIC AREAS

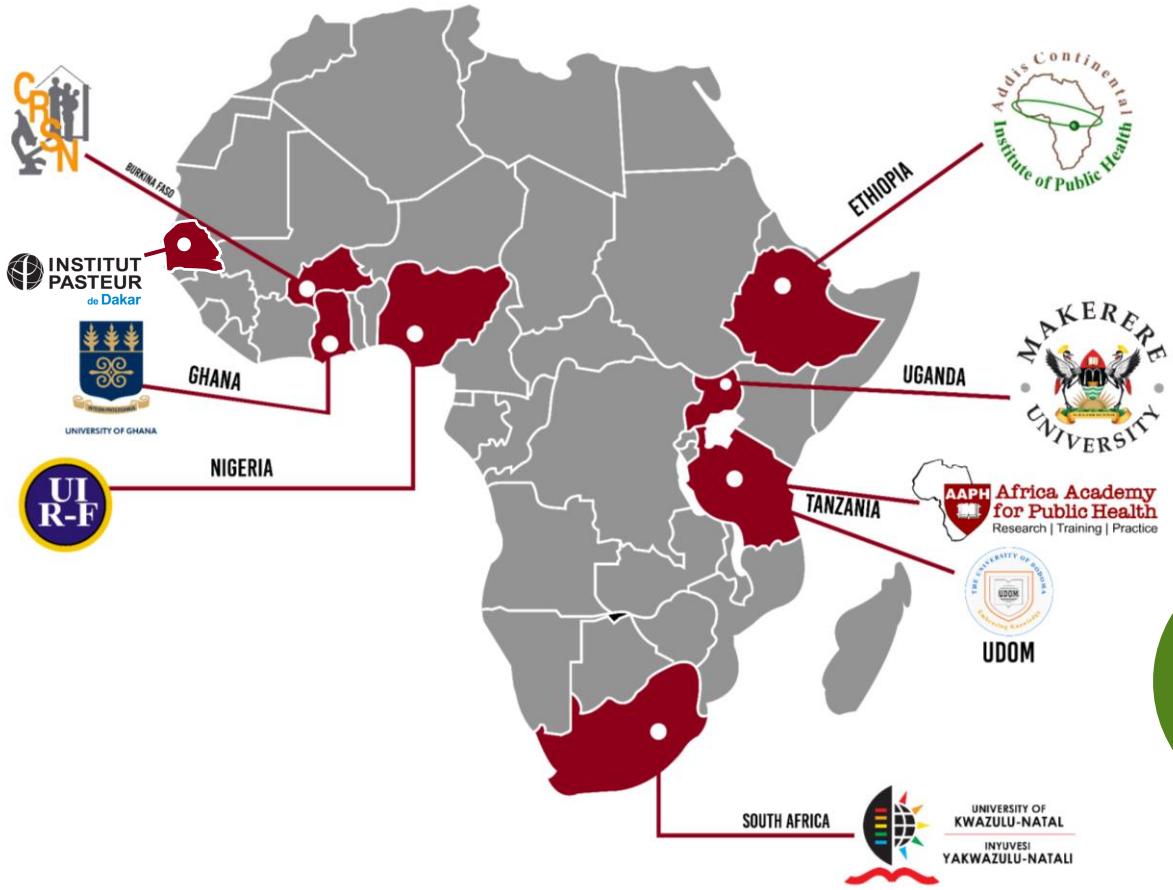
- Maternal, child and adolescent health
- Infectious Diseases (HIV/AIDS, TB, COVID)
- Non-Communicable Diseases (Mental Health)
- Trials (Nutrition Supplementations)
- Training | Capacity Building
- Data Science

AAPH | For better public health

REGIONAL REACH

ARISE AFRICA RESEARCH, IMPLEMENTATION SCIENCE & EDUCATION NETWORK

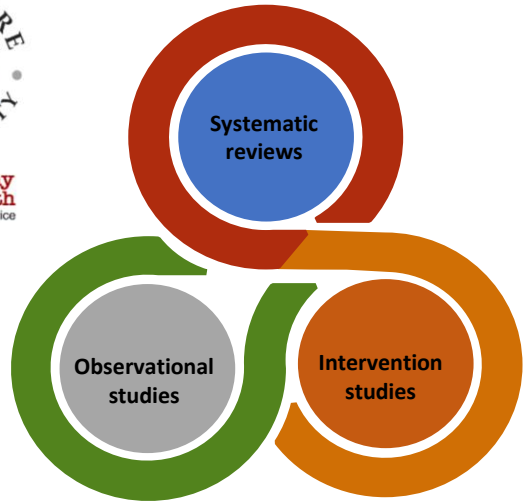
Robust training | Strong leadership | Greater health impact



Cutting-edge research

Capacity building

Sustainable partnerships



Short-term courses

Conferences
Symposia

Internships, Master, PhD, Postdoc

Africa Think Tank

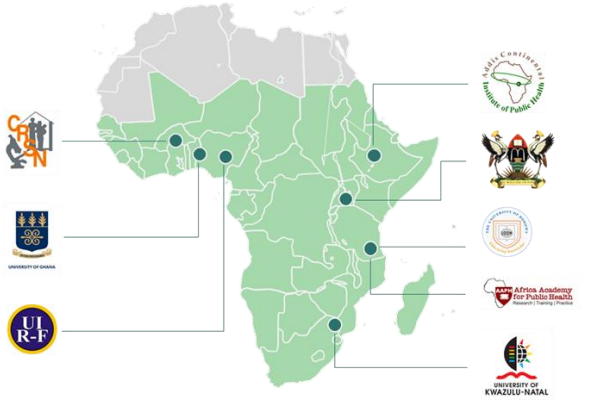
For better public health

GLOBAL REACH

DASH

Federal Ministry of Education and Research

RHISSA
Research Networks for Health Innovations in Sub-Saharan Africa



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CHANGE MAKER GLOBAL PARTNERS

Global Partners

ARISE NUTRIENT

CONSORTIUM OF UNIVERSITIES FOR GLOBAL HEALTH MEMBER

WHS Academic Alliance

CHANGE MAKER

FUNDED BY THE EUROPEAN UNION

AAPH For better public health

Adolescent health research & Implementation Science focus

AAPH For better public health

MEGA PROJECT

For better public health

Meals, Education and Gardens for in-school Adolescents (MEGA): a cluster randomized trial in Dodoma, Tanzania

School meals: at least 60% of the daily requirement of total energy intake

School gardens: Two garden clubs in each school; 60 adolescents in each school;

Nutrition education: 5 modules over 41 weeks

Community workshops: School garden as hub for community workshops

2 Schools

2 Schools

2 Schools: No Intervention

Outcomes

Adolescents: Hemoglobin; anthropometry, KAP

Parents: KAP regarding agriculture, nutrition and WASH

Participants

750 students from Form 1 and 2 students (14 to 17 years)

Assessment timepoints:

Baseline and endline

Wang et al., BMJ Open 2022

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Lessons learned for future programs

- Adolescents & Parents in partial and full intervention arms were both associated with LOWER odds of POOR DIET QUALITY

- Partial and full intervention arms were both associated with LOWER odds of Adolescent OVERWEIGHT AND OBESITY

- Adolescents in partial and full intervention arms were both associated with GREATER NUTRITION KNOWLEDGE

- Neither arms were associated with increased HEMOGLOBIN CONCENTRATIONS

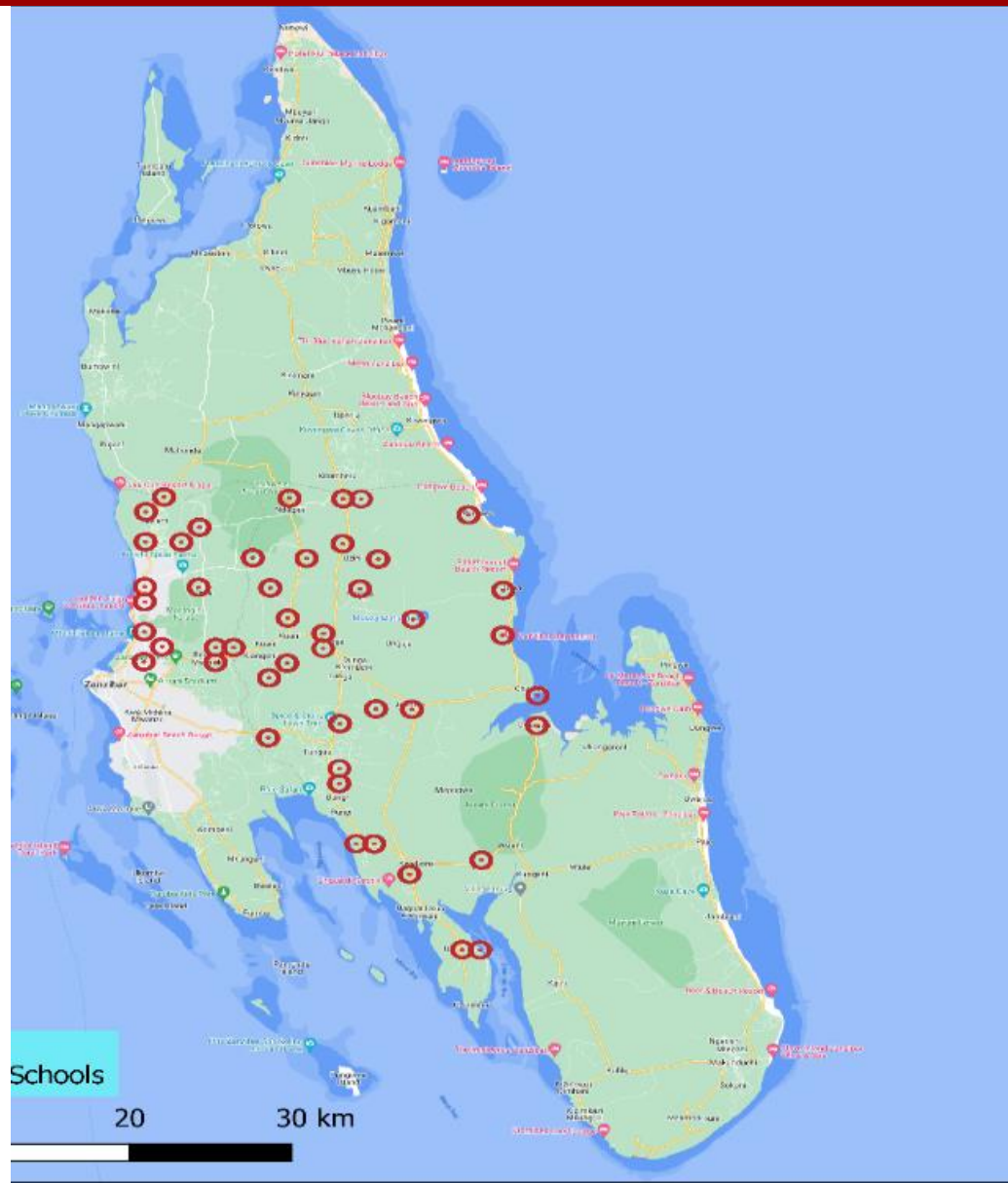
For better public health

Rutubisha Afya Project in Zanzibar

For better public health

Randomized trial Approach

- Wilaya ya Magharibi A and Wilaya ya Kati districts.
- **42 School in 3 arms**
  - 14 schools - weekly IFA
  - 14 schools - daily MMS
  - 14 schools - control
- **Actors involved**
  - School teachers
  - Study Pill distributers.
  - Fields workers



AAPH For better public health

Outcomes

38% lower risk of moderate or severe anemia in MMS schools compared to controls

- The learnings from Zanzibar are being used already for a UNICEF scale-up program with IFA supplementing all schools withing Unguja and Pemba islands.
- Remaining study supplements were donated to Zanzibar Ministry of Health.
- Qualitative process surveys will help guide feasibility and acceptability of continued school-based supplementation
- MMS more effective in Zanzibar than IFA.



SMZ
SERIKALI YA MAPINDUZI ZANZIBAR

World Health Organization

unicef


NIH
National Institutes of Health
Turning Discovery Into Health

ARISE

USAID
FROM THE AMERICAN PEOPLE

CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

Federal Ministry of Education and Research

NATIONAL INSTITUTE FOR MEDICAL RESEARCH

BILL & MELINDA GATES foundation

Save the Children

IZUMI
FOUNDATION

HARVARD
T.H. CHAN

MUHAS

THE UNIVERSITY OF DODOMA
UDOM
Embracing Knowledge

Addis Continental
Institute of Public Health

CRSN

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UNIVERSITY OF GHANA

UNIVERSITY OF
KWAZULU-NATAL
INYUVESI
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de Dakar


RUPRECHT-KARLS-
UNIVERSITÄT
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HIV Practice in Tanzania: Translating Evidence into Practice

HIS Annual Symposium 2025: Progress in Capacity Building for HIV/AIDS Implementation Science in Tanzania

David Sando, MD, PhD

Outline

- Background
- Status of HIV Epidemic in Tanzania
- Translating Evidence into practice
- Lesson Learned and challenges
- Summary
- Call to Action

Background

UNAIDS 95-95-95 targets by the year 2025[1].

- 95% of people living with HIV knowing their status,
- 95% of those diagnosed on antiretroviral therapy (ART),
- 95% of those on ART achieving viral suppression

1: 2023 UNAIDS Update.

Background

- So far
  - Decreased incidence of HIV over the past decade.
  - Number of people receiving ART has tripled in the last 10 years
- However, to achieve the targets,
  - Requires more than robust policies and ground-breaking research
  - Requires Translating this evidence into
    - practical, scalable, and contextually appropriate solutions.

Context of HIV in Tanzania

- Significant progress has been made
- By 2023 vs 2017 in Tanzania among adult[1]
  - 1st 95%= 82.7% vs 65.2% aware of their HIV status
  - 2nd 95% = 97.9% vs 94.9% on ART:
  - 3rd 95% =94.3% vs 88% viral load suppression
  - ✓Prevalence of HIV 4.4% vs 4.7%
  - ✓Annual incidence 0.18% vs 0.25%
- Yet persistent gaps remain; e.g case finding, Lower uptake of services by men & children, stigma and discrimination, inadequately integrated HIV services are in the broader healthcare systems, e.t.c[2,3]

1.Tanzania HIV Impact Survey 2022-2023 & 2016-2017 2. Tanzania : HIV Response sustainability Roadmap 2024, 3. Fifth National Multisectoral Strategic Framework for HIV 2021/22 – 2025/26 (NMSF V)

Translating Evidence into Practice

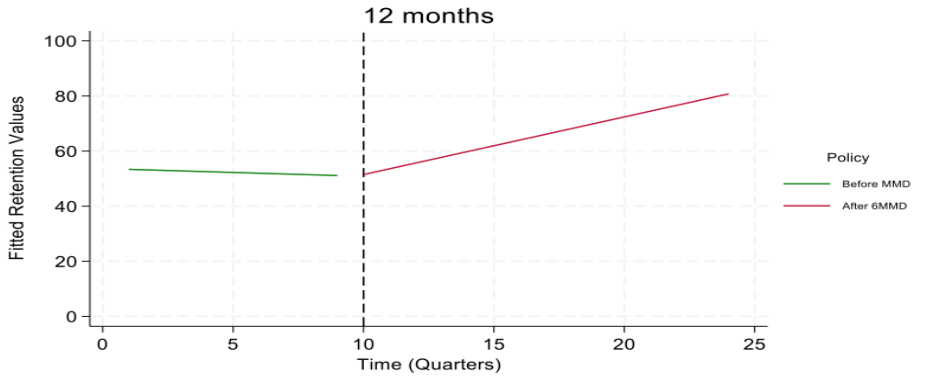
- Translating evidence into practice ensures that implementation challenges are systematically addressed:

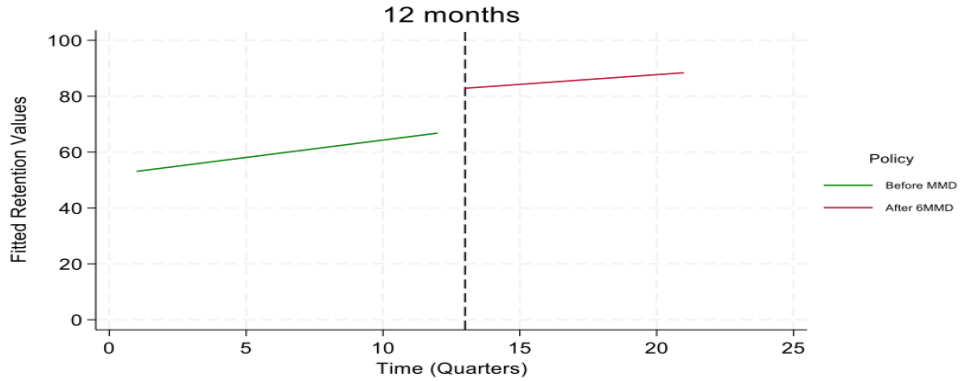
1. Bridging the gap between research findings and real-world implementation.
2. Ensuring interventions are tailored/adapted to the local healthcare context and the needs of the population.
3. Generating measurable and sustainable outcomes at both the community and national levels.

Translating Evidence into Practice

- **a) HIV Service Delivery Models (i.e DSDMs)[1]**
  - Evidence: client-centred approach that simplifies and adapts HIV services.
  - Practice: Implementation of community ART refills, multi-month dispensing in Tanzania.
  - **Targeting**: Implementation problem/gaps due to difference in clinical characteristics or needs, subpopulation and environmental context

Causal impact of 3MMD vs. 6MM





1; HIV Service Delivery Models –Tanzania; 2: National Integrated HIV, Viral Hepatitis And STI Management Guidelines 2023; 3: National Strategic Plan For Prevention And Control Of Non-Communicable Diseases 2021-2026, 4: . Fifth National Multisectoral Strategic Framework for HIV 2021/22 – 2025/26 (NMSF V); 5:

Translating Evidence into Practice

Total Years of Life Lost (YLL) and major causes, 2000 to 2040

Years of Life Lost per 100,000 population	2000 (n/%)	2007 (n/%)	2017 (n/%)	2030 (n/%)	2040 (n/%)
Total YLLs	68,984 (100%)	56,707 (100%)	35,253 (100%)	26,437 (100%)	22,437 (100%)
Non-Communicable Disease	16,004 (23%)	14,639 (26%)	13,753 (39%)	12,172 (46%)	10,948 (49%)
Communicable disease	42,204 (61%)	32,108 (57%)	13,892 (39%)	8,702 (33%)	6,555 (29%)
Maternal and neonatal disorders	5,315 (8%)	4,817 (8%)	3,512 (10%)	2,378 (9%)	1,814 (8%)

- Increase in NCD related deaths
- 26% of gen. pop. hypertensive in Tanzania
- Among PLHIV on ART, 30% are hypertensive
- Calls for NCD-HIV integration

Translating Evidence into Practice

- **b) Integration of Services[2,3]**
  - Evidence: Integrated HIV and non-communicable disease (NCD) care enhances efficiency.
  - Practice: Integration of hypertension and HIV care.
  - **Targeting**: One stop centre for NCD & HIV services for Better management of comorbidities

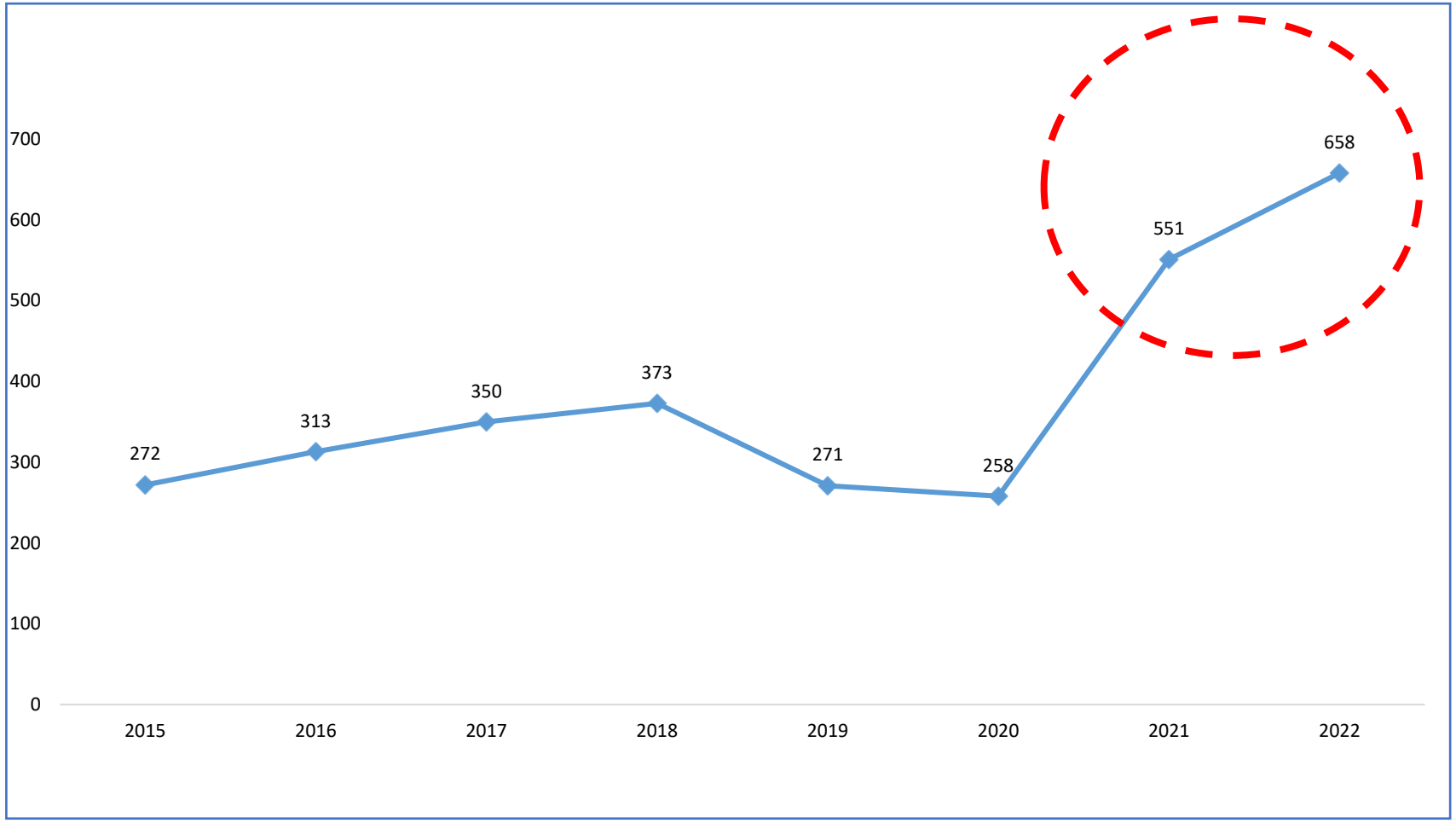
1; HIV Service Delivery Models –Tanzania; 2: National Integrated HIV, Viral Hepatitis And STI Management Guidelines 2023; 3: National Strategic Plan For Prevention And Control Of Non-Communicable Diseases 2021-2026, 4: . Fifth National Multisectoral Strategic Framework for HIV 2021/22 – 2025/26 (NMSF V); 5:

PILOT SITES BP SCREENING Oct 23 - Mar 24:

Facility Name:	15+ Age Attendees	Screened	Not Screened	(%) Screened	BP>140/90	(%) BP>140/91	Confirmed	Confirmed (%)	Treatment	Treatment(%)
Dar Es Salaam Region	18,565	17,939	626	97%	4,003	22%	3671	20%	1233	34%
Magomeni Health Center	4,411	4,232	179	96%	826	20%	561	13%	141	25%
Mnazi Mmoja Health Center	6,449	6,202	247	96%	1,151	19%	1091	18%	324	30%
Mwenge Dispensary	1,887	1,875	12	99%	468	25%	500	27%	299	60%
Temeke Regional Referral Hospital	5,818	5,630	188	97%	1,558	28%	1519	27%	469	31%
Kagera Region	4,859	4,459	400	92%	814	18%	693	16%	248	36%
Bukoba Regional Referral Hospital	2,050	1,961	89	96%	502	26%	468	24%	176	38%
Kaagya Dispensary	652	582	70	89%	23	4%	30	5%	5	17%
Kishanje Health Center	670	608	62	91%	150	25%	72	12%	26	36%
Zamzam Health Center	1,487	1,308	179	88%	139	11%	123	9%	41	33%

Cancer trend among PLHIV trend at ORCI 2015-2022

Cancer Registry ORCI



Rationale:

- 61% increment of cancers between 2020 & 2022 among PLHIV

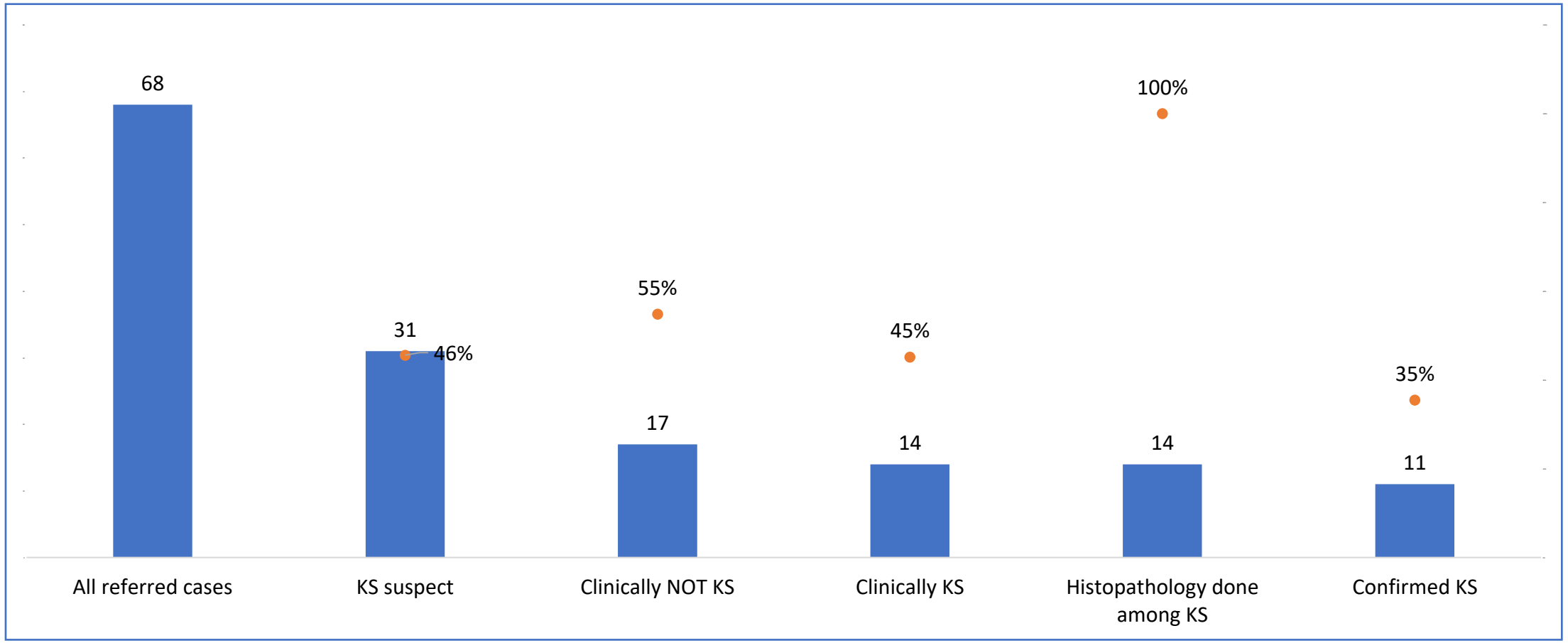
Opportunity:

- HCPs already capacitated with cervical cancer screening among WLHIV in all supported HFs

What has been done:

- Capacity building to HCPs in 20 demo HFs
- Supported M&E tools for data capturing
- OJT, mentorship & JSS done incl. occasional virtual meetings

KS suspect Vs confirmed cases



Translating Evidence into Practice

c) Digital Health Interventions[4]

- Evidence: Digital tools improve, service uptake, adherence and follow-up.
- Practice: Digital vending machines, Use of SMS reminders.
- **Targeting**: Stigma & Missed opportunities for Increased condom uptake, HTS services

Translating Evidence into Practice

d) Focus on Key Populations and Vulnerable Groups[1,3,4]

- Evidence: Tailored interventions reduce disparities in HIV care.
- Practice: Targeted programs for adolescents, young women, and key populations.
- **Impact**: Increased uptake of prevention services like PrEP and reduced stigma

Lessons Learned and Challenges

Area	Lessons Learned	Challenges
Capacity Building	Training programs (e.g., MUHAS, Harvard) and partnerships (e.g., Harvard, MUHAS, MDH, AAPH) enhance skills and research capacity.	Limited funding: retention of trained staff remains challenging.
Adopting Evidence-Based Practices	WHO guidelines, DSDMs, and integration improve outcomes and resourceuse.	Regional disparities : resistance to change delays practice updates.
Research and Innovation	Digital health tools improve service uptake: routine data strengthens program monitoring and decision-making.	Fragmented data systems; limited local research funding and capacity hinders progress.

Summary

- Tanzania had made significant progress towards UNAIDS targets but faces persistent gaps
- Continued investment in implementation science is critical for bridging the gaps between evidence and practice.
- Strengthen collaborations and scale up proven interventions for sustainability.

Call for Action

- Foster the use of implementation science to:
  - Scale up other potential models for DSDMs such as the use of pharmarcies & drug stores for ART refills.
  - Address barriers such as stigma, funding limitations and fragmented systems.
  - Integration of AI models in HIV care, treatment and support services.
  - Foster partnership for capacity building and innovation.

Asanteni

Until Everyone is Healthy

MDH
MANAGEMENT AND DEVELOPMENT FOR HEALTH

Incident pulmonary tuberculosis among HIV-infected patients initiating ART 2014 to 2018 in Dar es Salaam, Tanzania

Presenter : Dr. Grace Shayo

17/01/2025

Background

- TB remains a major contributor to global morbidity and mortality
  - 0.8 m cases were reported in 2023
    - (c.f. 10.7m in 2022 and 10.4m in 2021)
  - 1.25 m TB deaths in 2023 (161 000 among PLHIV)
    - (c.f. 1.32 m in 2022 and 1.42 million in 2021 and 1.40 million in 2020) (2024 WHO Global TB report)
- TB Dx in PLHIV is complicated by the increased prevalence of smear-negative tuberculosis (Swai *et al*, 2011)
  - 24–61% of HIV-TB coinfected patients have smear-negative tuberculosis (Getahun *et al*, 2007)

Background

- Smear-negative TB in PLHIV is associated with
  - Severe immunosupression thus lack of granuloma formation and cavitations (Elliot *et al*, 1993, Palmieri *et al*, 2002)
  - A complicated diagnosis from lack of typical symptoms (Wood et al, 2007)
  - Poor treatment outcomes, including death
  - Presence of EPTB in 60% of the patients (Leeds et al, 2012)
- The risk factors for incident TB (smear positive and negative) among PLHIV initiating ART have not been full explored

STUDY AIM

PRIMARY AIM

- To investigate socio-demographic and clinical factors associated with incident smear positive or negative TB

METHODOLOGY

❖ STUDY DESIGN

Nested cohort study in a double-blind placebo-controlled randomized trial of vitamin D3 (ToV 4)

❖ STUDY POPULATION

HIV-infected patients who screened negative to TB and were initiating ART.

Inclusion criteria

- Consenting adult men or women aged ≥18 years old
- Initiating ART at the time of randomization
- Have low vitamin D levels with a 25(OH)D concentration <30 ng/mL at ART initiation
- Intending to stay in Dar es Salaam for at least 1 year after enrollment

Exclusion criteria: Pregnancy or enrolled in any other clinical trial

METHODOLOGY

- **STUDY AREA/SETTING**

  CTCs in Dar es Salaam, Tanzania

- **STUDY DURATION**: Feb 2014 to March 2028

- **STUDY MEDICATIONS**: Participants were randomly assigned to receive either weekly 50,000-IU doses for 4 weeks followed by daily 2000IU D3 until 1 yr or a matching placebo in similar dosing schedule.

METHODOLOGY

❖**SAMPLE SIZE**

A sample of 4000 was estimated to give ≥90% power to detect a range of relative risks for pulmonary 3636 participants had TB results available for analysis.

METHODOLOGY

❖ DATA ANALYSIS

Continuous data was summarized as mean (± SD), categorical data as numbers and percentages

Cox regression to determine factors associated with incident TB, forcing in age and household wealth tertiles

Multinomial regression compared risk factors for incident smear negative and smear positive TB with reference to no TB status

❖**STUDY APPROVAL**: TH Chan HSPH, Tanzanian National Health Research Ethics Sub-Committee, TFDA

❖ Written informed consent was obtained from all participants

RESULTS

RESULTS

- 114/3636 (3.14%) participants developed TB within 1 year, 57/114 (50%) smear negative TB

  (Incidence to follow)

Table 1: Baseline characteristics of people living with HIV initiating ART without TB co-infection in Dar es Salaam Tanzania, February 2014 to March 2018. N=3636

Characteristic	Mean ± SD or n (%)
Age, years (mean)	38.53 (9.9)
Age categories, years	
<30	719 (19.8)
30-40	1544 (42.5)
≥41	1373 (37.8)
Sex	
Female	2567 (70.6)
Male	1069 (29.4)
Education	
No schooling / did not complete primary education	575 (15.8)
Primary education	2355(64.8)
Secondary or Advanced education	706(19.4)
Household wealth tertiles N=3635	
Q1-Rich	1195 (32.9)
Q2-Medium	1225 (33.7)
Q3-Poor	1216 (33.4)
Body mass index (kg/m^2)	
<18.5	685 (18.8)
18.5–24.9	1922 (52.9)
≥25.0	1029 (28.3)
CD4 T-cell count (cells per μL) N=3475	
<200	1494 (43.0)
200–349	847 (24.4)
≥350	1134 (32.6)
WHO HIV disease stage	
Stage I	750 (20.6)
Stage II	742 (20.4)
Stage III	1986 (54.6)
Stage IV	158 (4.3)
People residing in a household [median (IQR)], N=3635	4(3)
People residing in a household	
1-3	1383 (38.0)
4-6	1616 (44.5)
≥ 7	636 (17.5)
Current smoker	
Yes	173 (4.8)
No	3463 (95.2)
Current alcohol use	
Yes	668(18.4)
No	2968 (81.6)

Table 2: Hazard ratios for incident pulmonary TB among adults initiating ART in Dar es Salaam Tanzania, February 2014 to March 2018. N=114

	TB cases / 1000 person-months	Univariable hazard ratio (95% CI)	p-value	Multivariable hazard ratio (95% CI)	p-value
Age group					
<30	2.0	0.70 (0.39-1.24)	0.217	1.01(0.55-1.86)	0.968
30-40	3.4	1.18 (0.79-1.76)	0.417	1.34(0.89-2.04)	0.166
≥41	2.9	1		1	
Sex					
Female	2.2	1		1	
Male	4.9	2.22(1.54-3.21)	<0.001	1.90(1.26-2.86)	0.002
Education					
No schooling/did not complete primary	2.1	1		1	
Completed Primary School	3.1	1.49(0.83-2.68)	0.184	1.52(0.84-2.76)	0.169
Completed Secondary School or higher	2.9	1.40(0.70-2.76)	0.348	1.48(0.72-3.06)	0.285
Household wealth tertiles					
Rich	2.7	1		1	
Medium	3.3	1.22 (0.78-1.91)	0.382	1.33 (0.84-2.11)	0.226
Poor	2.9	1.06 (0.67-1.69)	0.802	1.06 (0.64-1.74)	0.822
BMI (kg/m²)					
<18.5	6.2	3.73(2.13-6.52)	<0.001	2.38(1.30-4.34)	0.005
18.5–24.9	2.8	1.77(1.04-3.00)	0.035	1.22 (0.70-2.13)	0.109
≥25.0	1.5	1		1	
CD4 T-cell count (cells per μL) N=3475					
<200	4.4	2.72(1.64-4.48)	<0.001	2.10 (1.26-3.51)	0.004
200-349	2.7	1.75(0.98-3.14)	0.059	1.62 (0.90-2.93)	0.109
≥350	1.6	1		1	
WHO HIV disease stage					
Stage I	1.8	1		1	
Stage II	2.2	1.22(0.62-2.42)	0.567	1.09 (0.54-2.20)	0.819
Stage III &IV	3.7	2.10(1.18-3.56)	0.011	1.50(0.83-2.72)	0.176
People residing in a household N=3635					
1-3 people	2.4	1		1	
4-6 people	3.1	1.26 (0.83-1.93)	0.283	1.37(0.88-2.24)	0.166
≥7	3.7	1.52 (0.91-2.53)	0.110	1.64 (0.96-2.79)	0.070
Current smoker					
Yes	4.8	1.68 (0.85-3.32)	0.134	1.07(0.50-2.28)	0.870
No	2.8	1		1	
Current alcohol use					
Yes	2.0	0.65(0.38-1.11)	0.116	0.61(0.34-1.08)	0.088
No	3.2	1		1	

*Multivariable model includes all variables in table

Table 3: Results of multinomial regression predicting smear positive and smear negative tuberculosis, Dar es Salaam Tanzania, February 2014 to March 2018

Variable	Smear positive Tuberculosis				Smear negative Tuberculosis				
	TB incidence /1000 person-months	Univariate OR (95% CI)	Likelihood ratio P value	Multivariate OR (95% CI)	TB incidence/1000 person-months	Univariate OR (95% CI)	Likelihood ratio P value	Multivariate OR (95% CI)	Multivariable Likelihood ratio P value
Age group			**0.312**				**0.312**		**0.480**
<30	1.13	0.95(0.42-2.12		1.43(0.33-6.30)	0.88	0.55(0.24-1.29)		0.76(0.16-3.61)	
30-40	1.84	1.50 (0.83-2.269)		1.68(0.59-4.83)	1.60	0.97(0.55-1.70)		1.07(038-2.98)	
≥41	1.24	1		1	1.66	1		1	
Sex			**<0.001**				**<0.001**		**0.002**
Female	0.89	1		1	1.29	1		1	
Male	2.97	3.16(1.86-5.35)		2.88(1.06-7.8)	1.95	1.44(0.84-2.48)		1.08(0.36-3.20)	
Education			**0.692**				**0.692**		**0.638**
No schooling/did not complete primary	1.13	0.85(0.32-2.25)		0.88(0.14-5.37)	0.97	0.61(0.23-1.63)		0.54(0.09-3.26)	
Completed Primary School	1.59	1.20(0.60-2.42)		1.27(0.34-4.71)	1.55	0.98(0.51-1.88)		0.86(0.26-2.82)	
Completed Secondary School or higher	1.34	1		1	1.61	1		1	
Household wealth tertiles			**0.171**				**0.171**		**0.187**
Q1-Rich	0.92	1		1	1.76	1		1	
Q2-Medium	1.98	0.62(0.30-1.28)		0.65(0.17-2.50)	1.30	1.33(0.71-2.50)		1.26(0.38-4.20)	
Q3-Poor	1.51	1.34(0.74-2.44		1.50(0.52-4.36)	1.35	0.98(0.50-1.93)		1.11(0.33-3.80)	

BMI (kg/m²)			**<0.001**				**<0.001**		**0.029**
<18.5	3.50	7.13(2.69-18.92		3.38(0.57-20.00)	2.55	2.0(0.95-4.17)		1.87(0.46-7.57)	
18.5–24.9	1.47	3.29(1.27-8.50)		1.78(0.33-9.77)	1.32	1.14(0.58-2.21)		1.01(0.0.30-3.46)	
≥25.0	0.43	1		1	1.11	1		1	
CD4 T-cell count (cells per µL) N=3475			**<0.001**				**<0.001**		**0.029**
<200	2.49	2.62(1.33-5.16)		1.82(0.54-6.09)	1.88	2.43(1.14-5.16)		2.18(0.57-8.30)	
200-349	0.85	0.99(0.40-2.46)		0.94(0.19-4.64)	1.90	2.71(1.21-6.07)		2.54(0.61-10.50)	
≥350	0.86	1		1	0.70	1		1	
WHO HIV disease stage			**0.003**				**0.003**		**0.072**
Stage I	0.70	1		1	1.06	1		1	
Stage II	0.48	0.36(0.15-0.84)		0.58(0.12-2.69)	1.68	0.74(0.35-1.56)		0.88(0.21-3.64)	
Stage III or IV	2.15	0.24(0.09-0.68)		0.32(0.05-1.90)	1.55	1.17(0.63-2.20)		1.41(0.45-4.40)	
People residing in a household N=3635			**0.104**				**0.104**		**0.074**
1-3 people	1.56	1		1	0.88	1		1	
4-6 people	1.45	1.16(0.53-2.52)		1.02(0.25-4.16)	1.62	0.37(0.18-0.77)		0.32(0.08-1.28)	
≥7	1.34	1.09(0.50-2.34)		1.09(0.28-4.20)	2.38	0.68(0.37-1.27)		0.67(0.23-2.00)	
Current smoker			**0.319**				**0.319**		**0.766**
Yes	2.12	1.55(0.55-4.32)		1.06(0.16-7.01)	2.65	1.97(0.78-5.00)		0.65(0.10-4.47)	
No	1.44	1		1	1.41	1		1	
Current alcohol use			**0.303**				**0.303**		**0.195**
Yes	0.94	0.62(0.28-1.36)		1.94(0.42-8.86)	1.08	0.72(0.34-1.52)		1.41(0.36-5.49	
No	1.60	1		1	1.56	1		1	

CONCLUSION

❖Patients initiating ART are still at risk for TB in their 1st year of treatment

❖ Male sex, low CD4 count and underweight are associated with increased hazards for incident TB in patients initiating ART

❖Compared to participants without TB, there was no statistical difference in the risk factors for smear negative TB and smear positive TB except for Male sex that was significantly associated with smear positive TB

RECOMMENDATIONS

- There is need to explore gender dynamics that influence the difference in occurrence of smear positive TB among genders

ACKNOWLEDGEMENTS

- MUHAS-HARVARD HIV Implementation Science team
- CTC in Dar es Salaam
- Management and Development for Health (MDH)
- AAPH
- Participants of the study

THANK YOU

Weight Gain During the First Year of ART Among Adults Living with HIV in Urban Tanzania

Pilly Chillo (MD, PhD, Cert. Cardiol.)

Post Doctoral Fellow – HIS Project

Muhimbili University/Harvard School of Public Health

PI's – Prof. Muhammad Bakari & Prof. Chris Sudfeld

Background

- A new threat of chronic NCDs is emerging as more PLWH are kept on ART in SSA/Tanzania

- Largely resulting from increasing overweight and obesity prevalence among PLWH
  - Associated with ↑hypertension, ↑dyslipidemia and ↑type 2 diabetes
  - Predisposes PLWH to CVDs, Stroke, CKD, etc

- Timely information about the increase in weight after ART initiation is therefore needed to inform prevention policies in SSA

Objective & Methods

Objectives:

1. To evaluate the relationship between socio-demographic and clinical characteristics with change in BMI over the first year of ART
2. To examine the cumulative incidence and predictors of incident overweight or obesity

Methods:

- A prospective cohort study of adults PLWH that were initiating ART & enrolled in a randomized, double-blind, placebo-controlled trial of vitamin D_3 supplementation in Dar es Salaam, Tanzania

- Conducted from February 2014 to March 2018 at four large government HIV CTCs

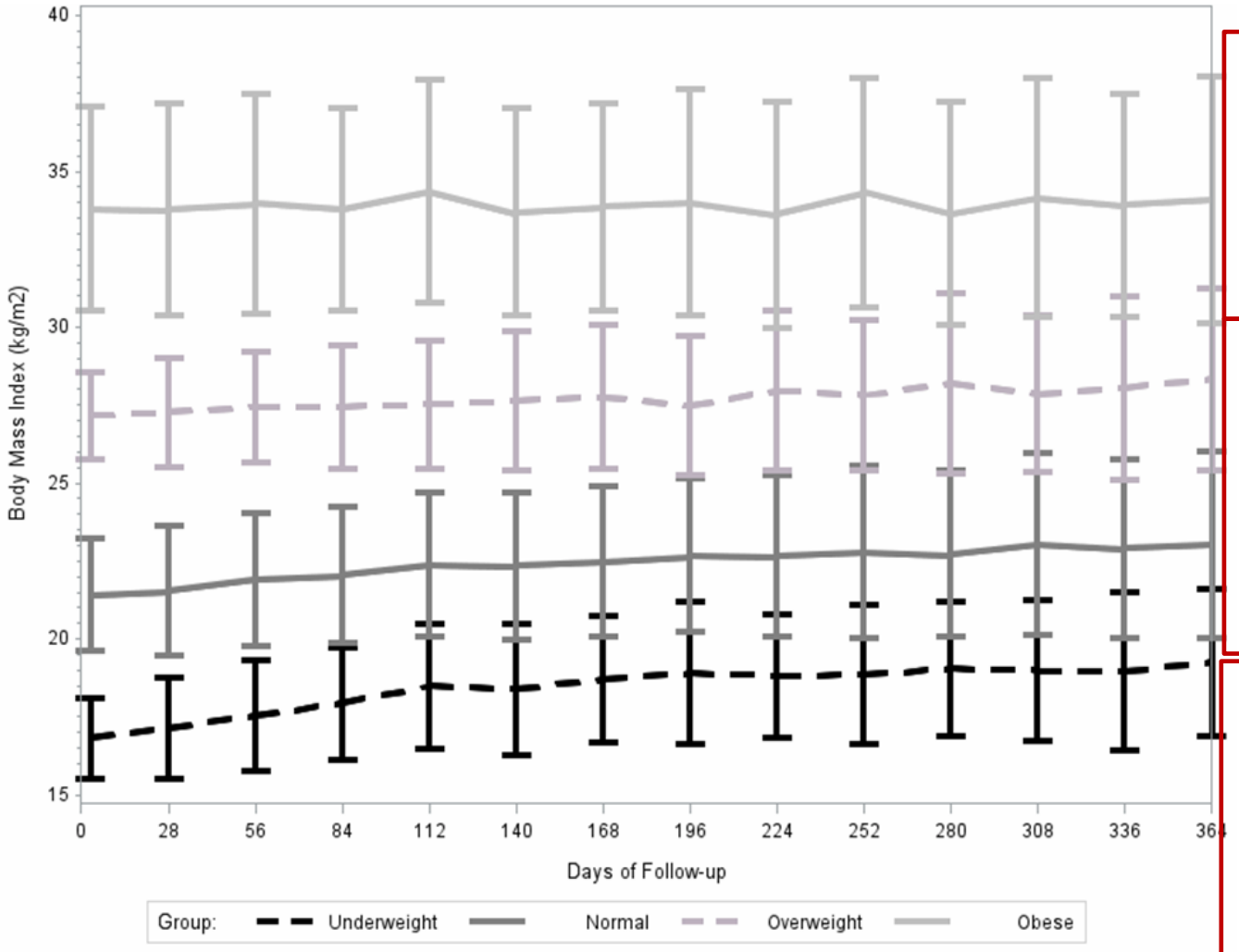
Results

Table 1. Baseline characteristics of the cohort of adult men and nonpregnant women living with HIV at ART initiation (n = 4000).

Characteristic	n (%)
Sex	
Female	2735 (68.4%)
Male	1265 (31.6%)
Age, years	
18-29.9	756 (18.9%)
30-39.9	1550 (38.8%)
40-49.9	1187 (29.7%)
50+	507 (12.7%)
Education	
No formal education	635 (15.9%)
Primary	2588 (64.7%)
Secondary/ advanced	775 (19.4%)
BMI, kg/m^2	
Underweight <18.5	844 (21.1%)
Normal 18.5-24.9	2102 (52.6%)
Overweight 25.0-29.9	677 (16.9%)
Obese ≥ 30.0	375 (9.4%)
Current smoker	184 (4.6%)
Current alcohol drinker	497 (12.4%)
CD4 T-cell count at ART initiation, cells per μL	
<200	1711 (42.8%)
200-349	906 (22.7%)
350-499	633 (15.8%)
≥500	562 (14.1%)
Missing	188 (4.7%)
WHO HIV disease stage at ART initiation	
I / II	1504 (37.6%)
III	2304 (57.6%)
IV	192 (4.8%)
Pulmonary tuberculosis co-infection at ART initiation	364 (9.1%)
ART regimen	
Efavirenz/lamivudine/tenofovir	3883 (97.1%)
Other ART regimen	117 (2.9%)
Randomized regimen	
Vitamin D	2001 (50.0%)
Placebo	1999 (50.0%)

Results

Mean (SD) BMI from ART initiation to one year of ART stratified by baseline BMI



Mean BMI ↑

+2.3 for underweight
+1.6 for normal
+1.1 for overweight
+0.3 for obese

Factors a/ with ↑BMI

- Females
- Wealthier PLWH
- <200 CD4+
- HIV Stage 4
- Underwt at baseline

Incident overwt/obese

- **17.8%**
- Predicted by (RR);
  - Females (↑45%)
  - CD4<200 (↑40%)
  - Underwt at baseline (↓6%)

Conclusion

- There is an urgent need to address high BMI at ART initiation and weight gain during the initial year of treatment among PLHIV

- We have provided valuable insights into sociodemographic and clinical factors that might identify subpopulations that may benefit the most from interventions that promote healthy weight

- However, it also remains important to note that underweight remains an issue in this population, and some degree of weight gain may be indicative of a ‘return to health’ for some patients.

Original Research Article

Sociodemographic and Clinical Predictors of Weight Gain During the First Year of Antiretroviral Therapy among Adults Living With HIV in Urban Tanzania

Journal of the International Association of Providers of AIDS Care
Volume 23: 1-10

DOI: 10.1177/23259582241281010
journals.sagepub.com/home/jia
Sage

Pilly Chillo, MD, PhD[1], Alfa Muhihi, MD, MPH[2], Goodarz Danaei, MD, ScD[3,4], Muhammad Bakari, MSc[1], Gideon Kwesigabo, MD, MSc, MEd, PhD[5], Marina Njelekela, MD, PhD, MPH[6], Nzovu Ulenga, PhD[7], Wafaie W. Fawzi, MBBS, DrPH[3,4,8], Ferdinand Mugusi, MD, MMed[1], and Christopher R. Sudfeld, ScD[3,8]

Other Activities …

- Participated in training HCWs on ***HIV, NCDs & Nutrition Short Course*** in November 2023

- Supervising an MMED (Dr. Hadija Sharifu) dissertation on ***Implementation Science***
- Title: *Opportunistic screening of hypertension among companions of patients attending MUHAS Dental Clinic – An Implementation Science Research*

My future plans…

- Analyse the care cascade of Hypertension in a large database – MDH data

- **Apply for grant to conduct an IS research on HIV/HT care integration in Tanzania:**
  - ✓ **https://grants.nih.gov/grants/guide/pa-files/PAR-23-191.html**
  - ✓ HIV-associated Non-Communicable Diseases Research at Low- and Middle-Income Country Institutions (R21)

Acknowledgements

Prof. Muhammad Bakari
MUHAS

Prof. Chris Sudfeld
HSPH

Prof. Gideon Kwesigabo
MUHAS

Dr. Marina Njelekela
Deloitte/MUHAS

Prof. Goodarz Danaei
HSPH

MUHAS

MDH

NIH National Institutes of Health

HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

.

HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH

HIV TREATMENT AND CARE: PREVENTION OF HIV DRUG RESISTANCE IN TANZANIA

George M. Bwire, PhD

Lecturer at MUHAS, HIS Fellow AND Harvard Visiting Graduate

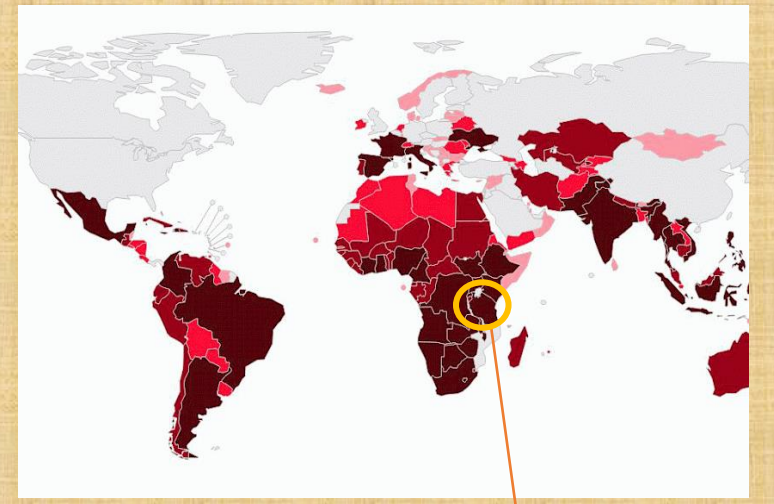
Mentors: HIV Implementation Science (HIS) Fellowship

Prof. Christopher Sudfeld (Harvard, USA)

Prof. Muhammad Bakari (MUHAS, Tanzania)

Protea, Dar es Salaam, 17 January 2025

HIV Global and Country Situation



Source: *2022,People living with HIV / Grafik, aidsinfo.unaids.org*

Source:Ontheworldmap.com

- Globally, approximately **39.9 million people living with HIV (PLHIV),** with about **1.3 million** new cases in 2023 (WHO 2023).

- It is estimated that more than **two-third of PLHIV globally** are residents of **sub-Saharan African (SSA) countries including Tanzania**.

- As of March 2023, **Tanzania** had approximately **1.5million adults (aged 15 years and older), living with HIV,** where the **prevalence among adults was 4.4%** (Tanzania HIV Impact Survey 2022-2023).

Antiretrovial Therapy (ART) and HIV Drug Resistance (HIVDR) in Tanzania

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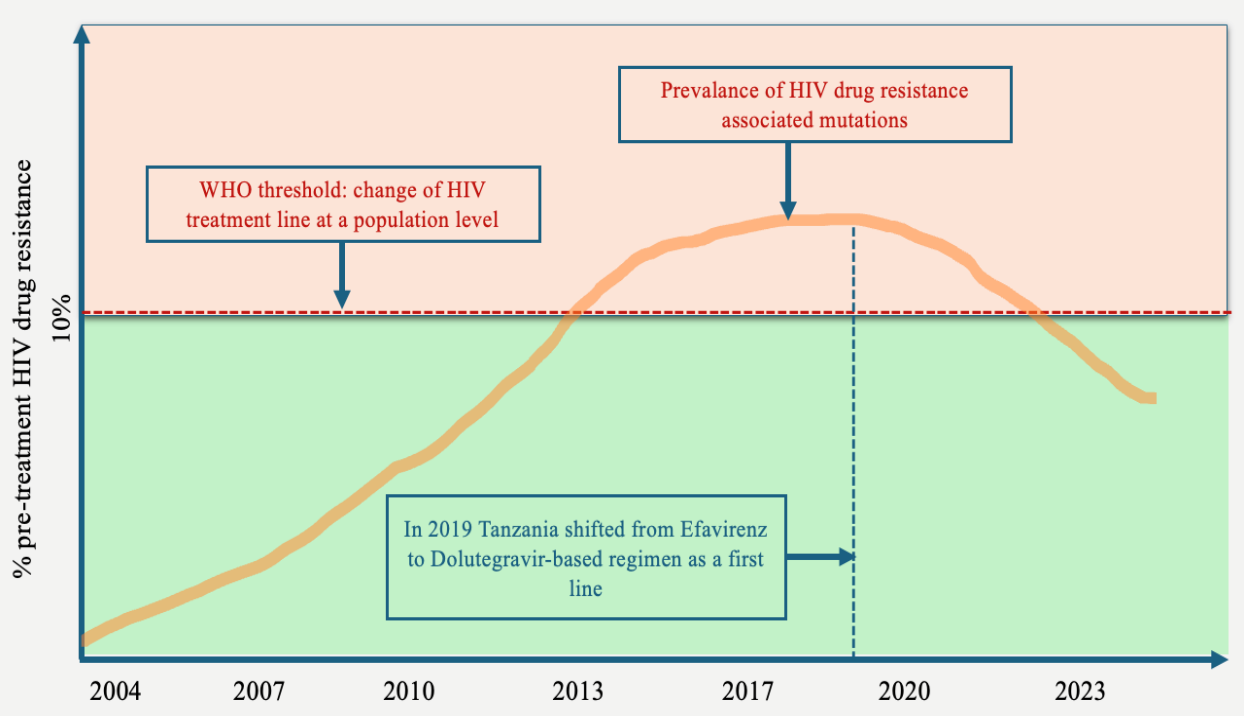


❖ **Before 2019**, the default **first-line antiretroviral therapy** (ART) regimen was **Tenofovir + Lamivudine + Efavirenz (TLE).**

❖ Due to **high resistance to Efavirenz (E) (>10% pre-treatment drug resistance), Dolutegravir (D)** was introduced and Dolutegravir based regimen (**TLD)** became the **first-line for adults and adolescents and for all population at a later stage.**

Current Situation: Viral suppression rate and HIV drug resistance in Dar es Salaam

www.nature.com/scientificreports

scientific reports

Check for updates

OPEN

High viral suppression and detection of dolutegravir-resistance associated mutations in treatment-experienced Tanzanian adults living with HIV-1 in Dar es Salaam

George M. Bwire[1,2✉], Beatrice Godwin Aiko[3,4], Idda H. Mosha[5], Mary S. Kilapilo[2], Alli Mangara[6], Patrick Kazonda[6], Janeth P. Swai[7], Omary Swalehe[7], Michael R. Jordan[8], Jurgen Vercauteren[1], David Sando[9], David Temba[9], Amani Shao[9], Wilhellmuss Mauka[9], Catherine Decouttere[4], Nico Vandaele[4], Raphael Z. Sangeda[2], Japhet Killewo[10] & Anne-Mieke Vandamme[1,11]

Conclusion: Rather than predominantly relying on transitioning patients to a second-line ART regimen **(overreliance on new drugs)**, there is a critical need to implement proactive mechanisms to prevent resistance to existing regimens.

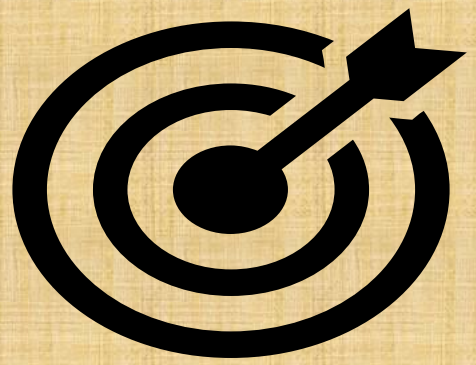
Summary of the findings

- **Viral suppression rate: 94.5% (95% CI 92.3– 96.2%).**

HIV drug resistance for those with unsuppressed viral loads (≥1,000 copies/mL):

- **Prevalence of any surveillance drug resistance mutations: 41.4% (13/31, 95%CI: 24.55 – 59.33%)**
- **The mutation rate was 10.1% (3/30, 95%CI: -0.7 – 20.7) for integrase inhibitors (i.e., Dolutegravir).**
- All patients who had resistance to dolutegravir also had resistance to the two nucleotide reverse transcriptase inhibitors (**Tenofovir and Lamivudine**)

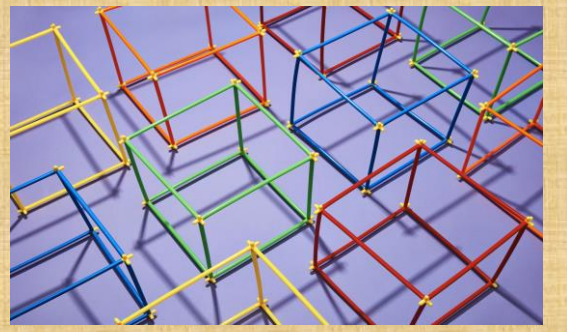
Objectives



- Objective: Design and pilot interventions to prevent HIV drug resistance (HIVDR) in Dar es Salaam, Tanzania

Specific aims:

- To conduct a survey to determine the prevalance of HIVDR in the study area
- To explore interventions to prevent HIVDR (partially supported by HIS through D43)



- Approach: Implementation Science Research

DURING HIS FELLOWSHIP

1. REVIEW: DIFFERENTIATED SERVICE DELIVERY MODELS (DSDs)

Background

- Differentiated service delivery (DSD) models are client-centered approaches where clinically stable people living with HIV (PLHIV) meet to receive various services, including psychosocial support, brief symptoms screening, and refills of antiretroviral medications, among others

Methods

- The review protocol was registered in PROSPERO **(**CRD42023418988).
- We searched the literatures from PubMed, Scopus, Web of Science, Embase and Google Scholar from their inception through May 2023.
- Eligible randomized controlled trials (RCTs) of adherence clubs were reviewed to assess impact on **retention in HIV** care and **viral suppression**.

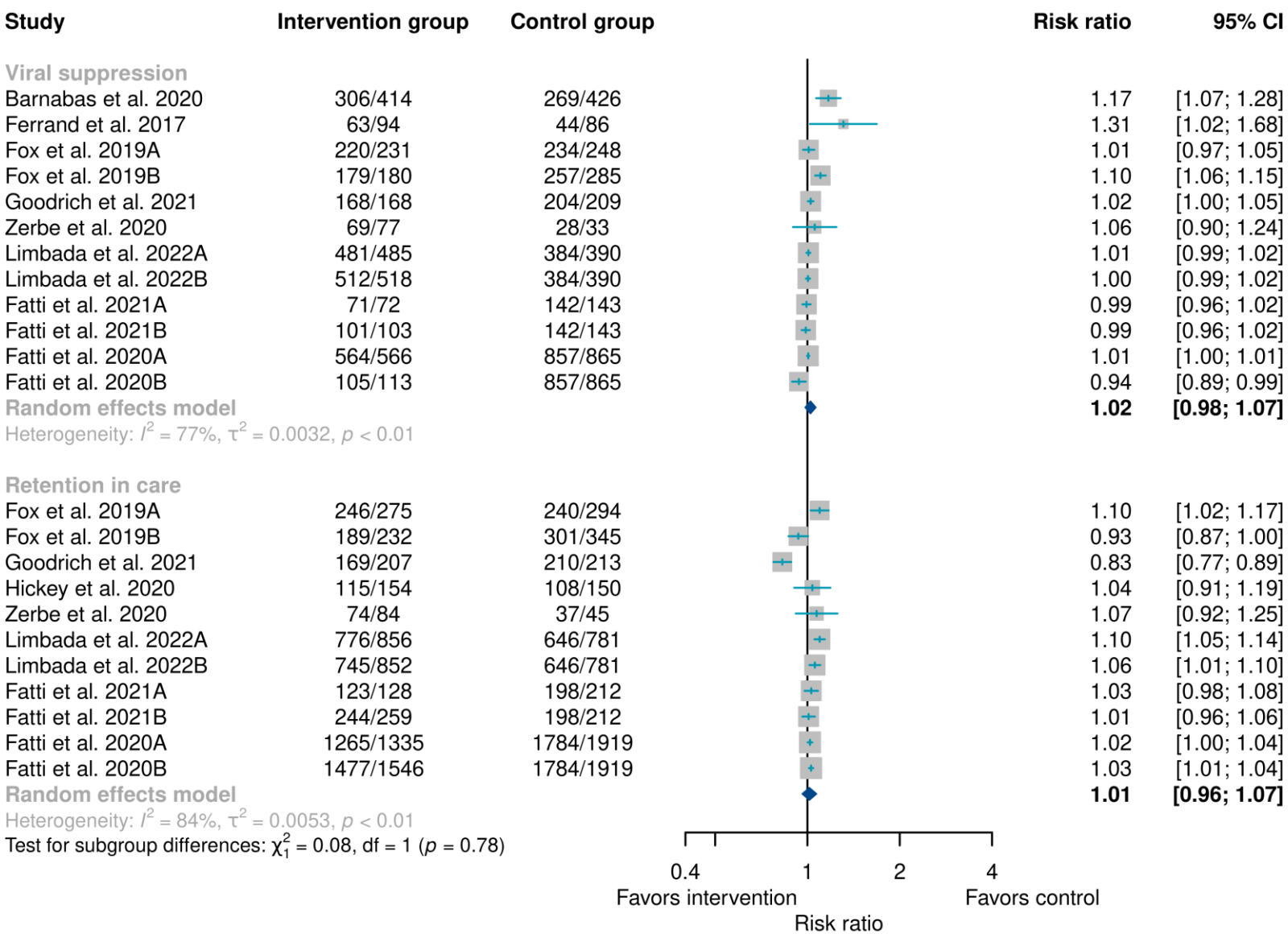
Partially funded by: Fogarty International Center of the National Institutes of Health under Award Number 5D43TW0

RESULTS

Effectiveness of Differentiated Service Delivery models is comparable to standard of care in maintaining care and achieving viral suppression in stable PLHIV

RECOMMENDATION

In order to maximize adoption, an Implementation Science approach is crucial for designing effective strategies and overcoming challenges.



Bwire et al., 2023 (DOI: 10.1002/rmv.2479)

2. BARRIERS AND ENABLERS TO RETENTION IN HIV CARE AND ADHERENCE TO ART

HIV/AIDS - Research and Palliative Care

Dovepress

open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

Barriers and Enablers to Retention in HIV Care and Adherence to Antiretroviral Therapy: Evidence from Dar es Salaam, Tanzania

Godfrey L Sambayi[1,*], George M Bwire[2,3,*], Mary Spicar Kilapilo[3], David T Myemba[4], Idda H Mosha[5], Manase Kilonzi[6], Renatus B Magati[7], Maryam Amour[8], Rogers Mwakalukwa[1], Ally Nassoro Mangara[9], Muhammad Bakari[10], Christopher R Sudfeld[11], Mecky IN Matee[12], Raphael Z Sangeda[3], Lisa V Adams[13], Japhet Killewo[14]

Methods: Qualitative study with stakeholders and people living with HIV

Results: Stigma, house hold income and quality of care

Conclusion: We recommend the **implementation of peer support groups and financial support** through small microfinance groups as interventions to increase retention in HIV care and adherence to ART

Partially funded by: Fogarty International Center of the National Institutes of Health under Award Number 5D43TW0

3. FEASIBILITY OF COMBINING MICROFINANCE AND PEER SUPPORT GROUP

Microfinance groups as a platform for financial services, peer support, and learning for people living with HIV on antiretroviral therapy in Dar es Salaam, Tanzania

George Msema Bwire[1*], Beatrice Aiko[2], David T. Myemba[2], Alli Mangara[3], Rejea Magati[4], Idda H. Mosha[5], Raphael Z. Sangeda[1], Japhet Killewo[3], Christopher Sudfeld[7], Muhammad Bakari[8]

Manuscript under preparation

Methods: Qulitative study with stakeholders

Conclusion: Integrating microfinance with peer support groups is feasible, with various facilitators enhancing its success, such as shared goals and mutual trust, while barriers like limited resources and group sustainability challenges may need to be addressed

Fully funded by: Fogarty International Center of the National Institutes of Health under Award Number 5D43TW0

Way Forward

- 1. Finalization of Manuscript for Publication
- 2. Post-Doctoral Fellowship: HBNU *(Awaiting Final Decision)*
- 3. Grant Writing – NIH K-43

Fogarty Global Health Training Program

Harvard University
Boston University
Northwestern University
University of New Mexico

HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH

BU School of Public Health

Northwestern Medicine

UNM HEALTH SCIENCES

ACKNOWLEDGEMENTS

NIH Funders

Office of AIDS Research

Fogarty International Center

Eunice Kennedy Shriver National Institute of Child Health & Human Development

National Institute of Mental Health

HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH

HIV Implementation Science Fellow

Retention to- and reasons for discontinuation from facility-based PrEP services among female sex workers in Tanzania

Wigilya Mikomangwa

PhD cand. HIS fellow

Presentation outline

Background

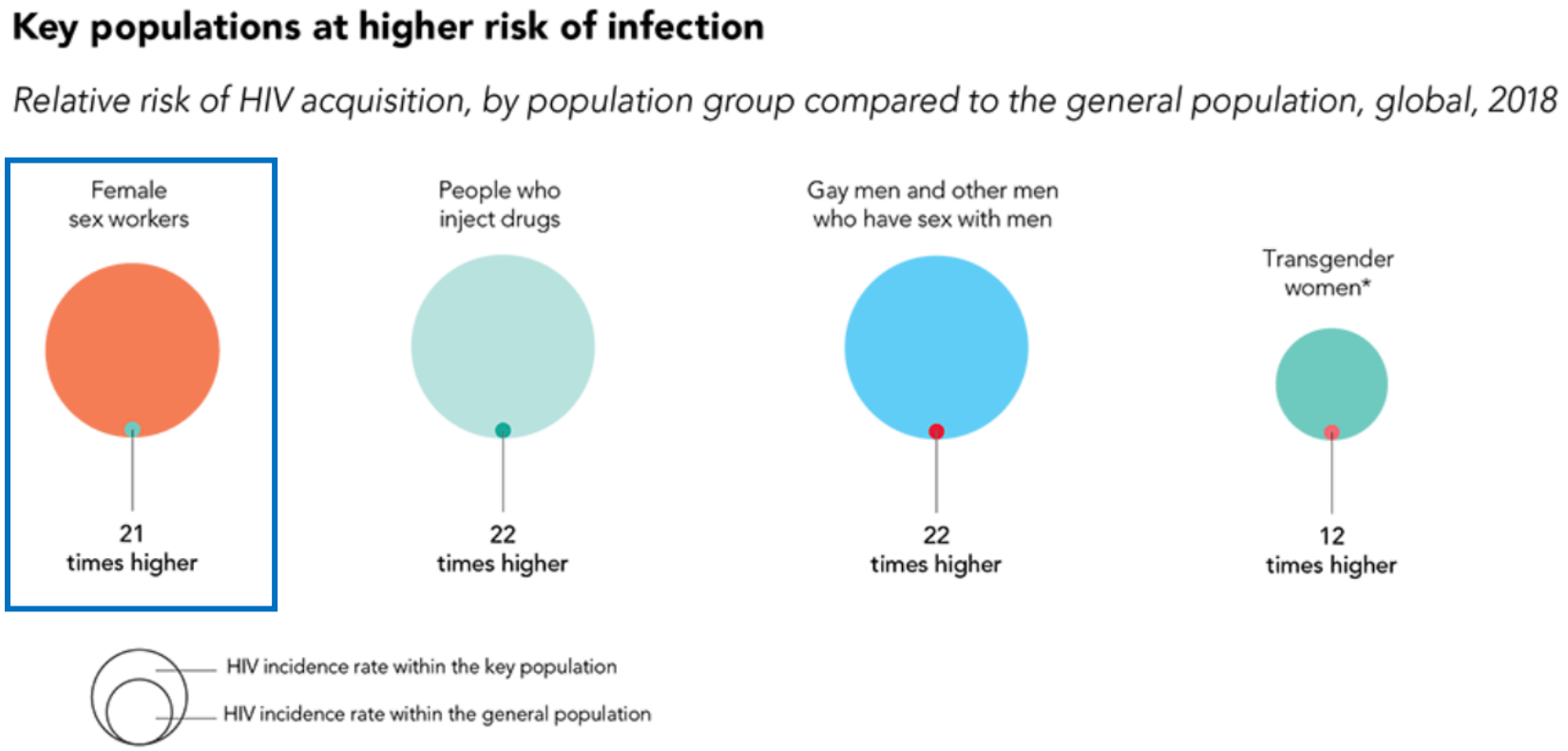
Summary of key findings

Courses attended under HIS

Summary of progress

Background 1/2

- HIV infections are more prevalent among members of KP accounting for 70% of global new HIV infections in 2022. (UNAIDS, 2023)



- WHO recommends the use of daily oral PrEP among KP (WHO 2015)
- The protective effectiveness of PrEP is related to adherence and retention (Grant et al., 2010)

Background 2/2

- Tanzania rolled out PrEP in 2021
- Scarcity of evidence on the retention of FSWs in Tanzania
- We aimed to evaluate the retention rates and reasons for discontinuation from the PrEP program among FSWs.

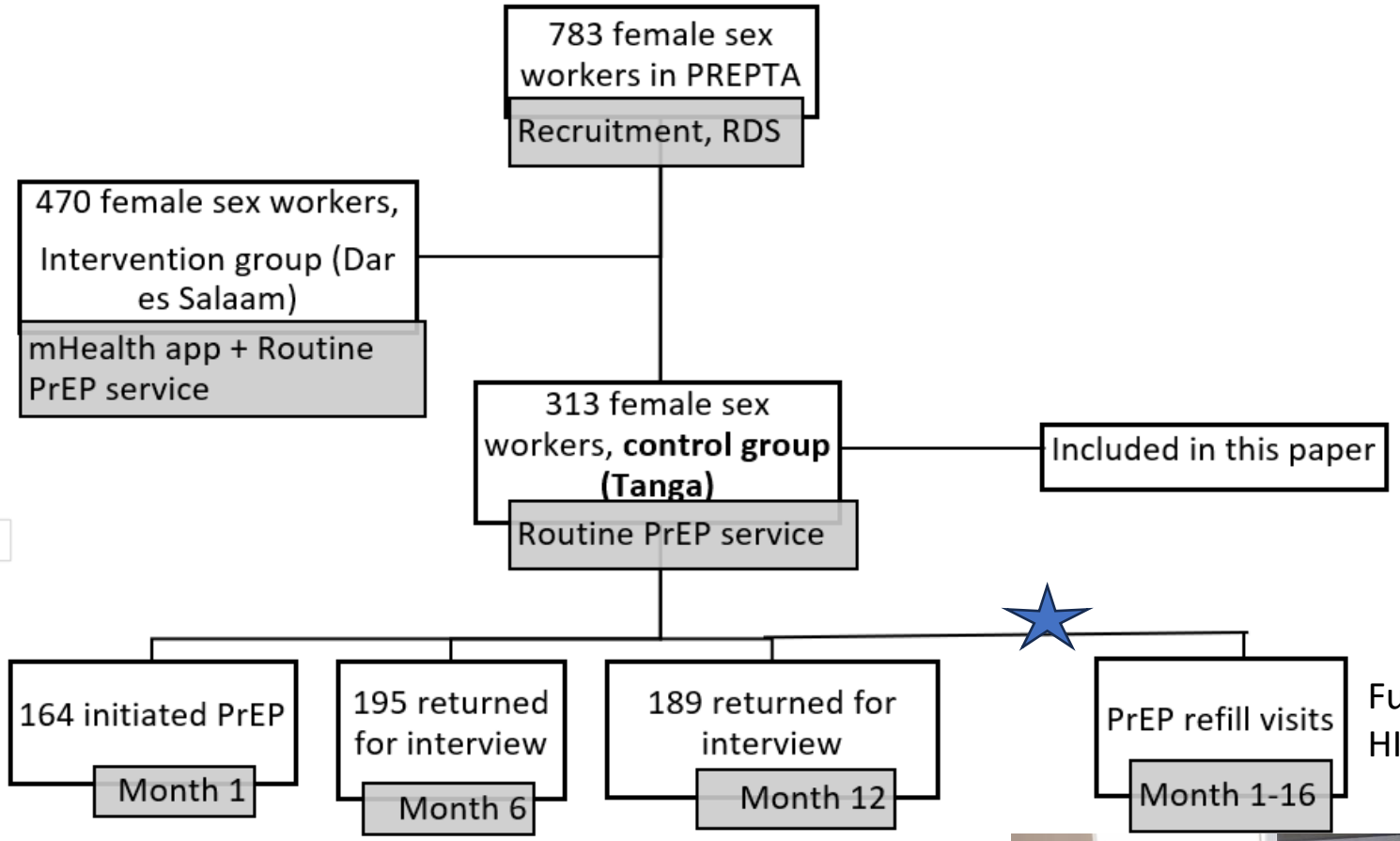
- The HIS project partly funded the conduct of the PhD study

Methods

- Part of the Pragmatic quasi-experimental trial for HIV preexposure prophylaxis in Tanzania (PREPTA).
- MUHAS implemented the trial in collaboration with UiO.
- Approved by MUHAS IRB, NatREC (Tz) and REK (Nor)
- The trial was conducted in Dar es Salaam City (intervention-mHealth) and Tanga City (control) from 2021 to 2023.
- Respondent-driven sampling.

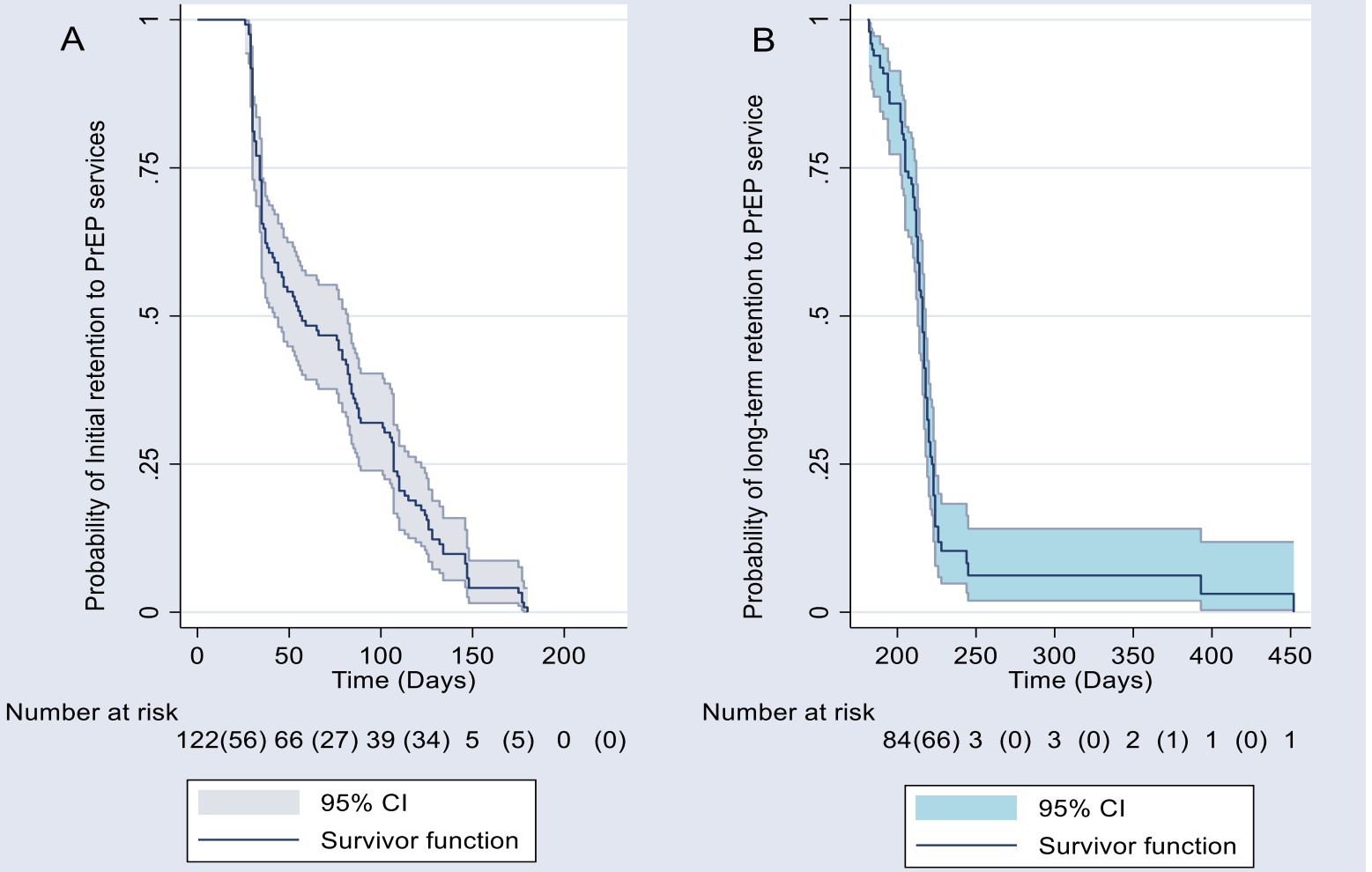
Trial registration: International Clinical Trials Registry Platform PACTR202003823226570

Methods
(summer fellowship)



Funded by HIS project

Key findings



Kaplan-Meier survival estimates of retention to PrEP services among female sex workers.

Factors associated with retention

Early retention (1-6months)

- Perceived HIV medium risk
- Sex work as the only source of income (decr. Ret)
- 10-29 sex clients per month (dec. Ret)

Long-term retention (6-10 months)

- Perceived HIV medium risk
- High PrEP stigma (dec. ret)

Establishing client-centred approaches targeting PrEP stigma and HIV risk awareness is crucial to optimize retention in facility-based PrEP services.

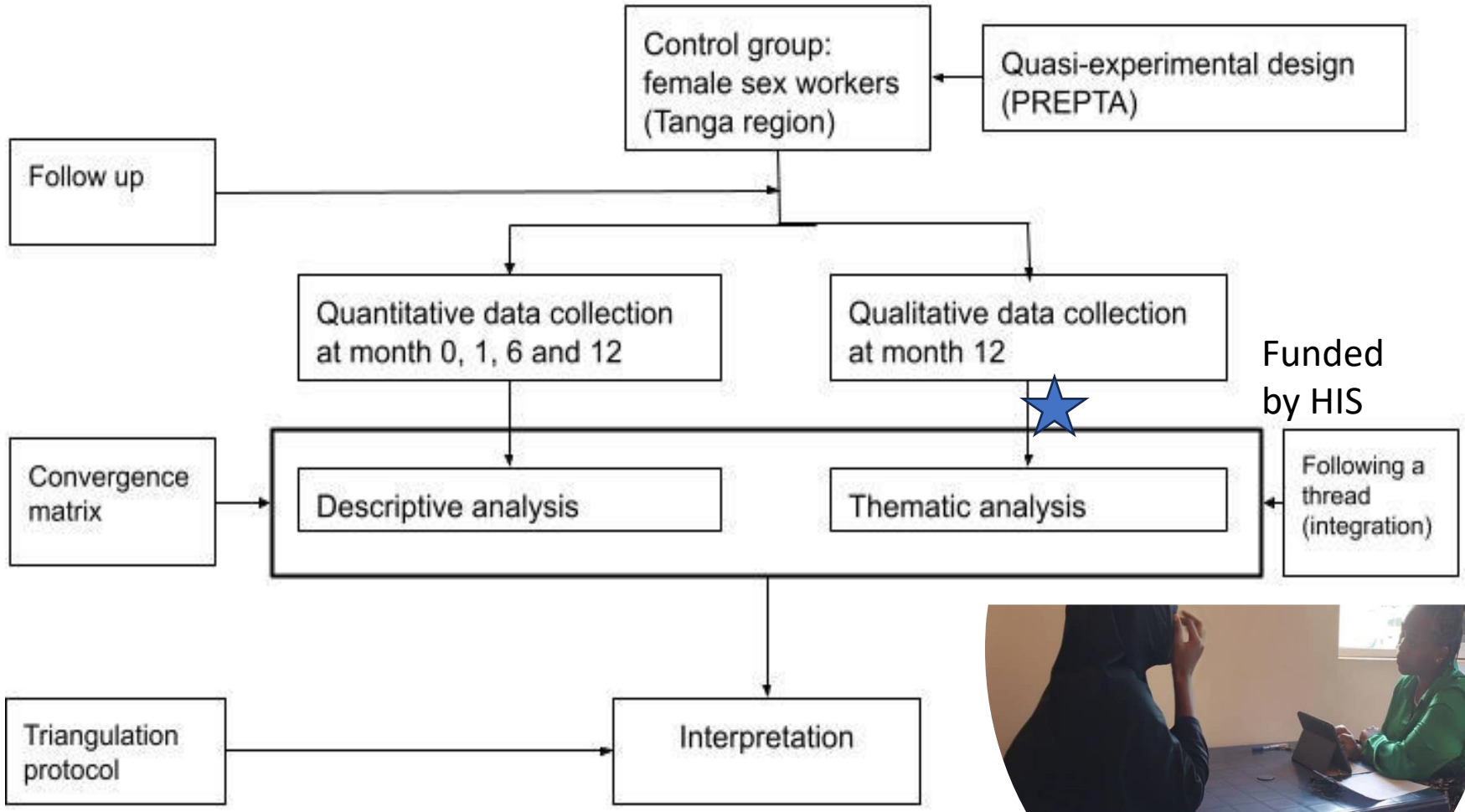
BMJ Global Health

Determinants of retention patterns in facility-based HIV pre-exposure prophylaxis services among female sex workers in Northeastern Tanzania

Wigilya P. Mikomangwa*[1,2,5,7], Kåre Moen[2], Elia J. Mmbaga[1,2], Emmy Metta[3], Melkizedeck T. Leshabari[3], Stephen M. Kibusi[4], Christopher R. Sudfeld[5], Muhammad Bakari[6], Appolinary A. R. Kamuhabwa[7], Gideon Kwesigabo[1]

Submitted manuscript

Methods
(PhD HIS fellowship)



Funded by HIS

Distribution of themes and sub-themes by corresponding theories

Theory or model	Theoretical Constructs	Themes	sub-themes
HBM	Perceived barrier	Experienced threat/burden to PrEP use	Experienced or fear of side effects
			Fear of drug interaction
			Large size of PrEP pills
			PrEP stock out
			Experienced or fear of anticipated stigma related to PrEP
	Perceived susceptibility	Low risk of HIV	Reliance on condom use
			Stopping sex work
	Self-efficacy	Low self-efficacy	Inability to use daily pills
	Cue to action	Disapproval from social circle	Lack of peer support
			Discouragement from peers and family members
TPB	Subjective norm	Subjective norm associated with PrEP	Resemblance of PrEP with antiretroviral pills
			Community's negative perception of PrEP users
	Attitude	Negative attitude toward daily PrEP	Lack of trust in daily PrEP dosing
			Dislike of daily PrEP dosing

Quantitative results	%	IDI themes	Convergence output: meta-themes
Experienced and anticipated stigma related to PrEP***	18.6	Experienced threat to PrEP use	**Convergence:** Clinical and unfavourable experiences as dual determinants of PrEP discontinuation
Experienced side effects	44.5		
Discontinued because of side effects**	39.5		
Discontinued for medical reasons	12.5		
Complained about large pill size	20.1		
Discontinued due to the use of many other medications	4.2		
Discontinued because of pregnancy	4.5		
Use condoms all the time with clients****	29.9	Low risk of HIV	**Convergence:** The role of self-assessed HIV risk on PrEP discontinuation
Do not feel at risk of HIV*****	17.5		
No longer sex worker	33.3		
Low PrEP self-efficacy	0.4	Low self-efficacy	**Convergence:** Changing priorities and Low self-efficacy
No longer interested in daily PrEP	18.2		
Difficultness in taking pills daily	18.2		
Received negative reaction on PrEP use	21.6	Disapproval from social circle	Convergence: Social pressure as a precipitating factor to early PrEP discontinuation
Partner or family do not want her to use PrEP	6.3		
Dissatisfied with PrEP medications	5.1	Negative attitude to daily PrEP dosing regimen	**Convergence and expansion:** Negative attitude to daily dosing as a factor to PrEP discontinuation.
Disliked pill size*	17.0		
Disliked taste of the pill*	10.4		
Disliked pill colour*	4.7		
Disliked daily PrEP dosing regimen*	12.7		
Preferred other PrEP dosing regimen to daily PrEP	52.8		
		Subjective norm associated with PrEP	**Complementary:** The role of subjective norms in PrEP discontinuation

"I stopped to prove them wrong:" Reasons for discontinuing facility-based daily oral HIV pre-exposure prophylaxis among female sex workers in Tanzania. A convergent mixed method study

Wigilya P. Mikomangwa*[1,2,5,7], Emmy Metta[3], Kåre Moen[2], Elia J. Mmbaga[1,2], Melkizedeck T. Leshabari[3], Stephen M. Kibusi[4], Christopher R. Sudfeld[5], Muhammad Bakari[6], Appolinary A. R. Kamuhabwa[7], Gideon Kwesigabo[1]

Manuscript under review by co-authors

Courses attended at HSPH

Summer 2023 (7.5 credits)

Implementation Research in Health and Healthcare

Study design in Clinical Epidemiology

Introduction to Systematic Review and Meta-Analysis

Fall 2 2024 (5 credits)

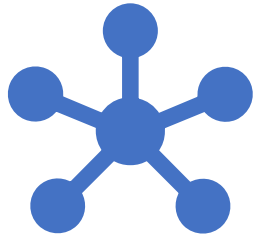
Database Analytics in Pharmacoepidemiology

Decision Analysis for Health and Medical Practices

Summary of HIS contribution in PhD Thesis

Completed 2 study objectives of PhD project (1 submitted, 1 finalized) partly funded by HIS

Attended courses with 12.5credits



Established network

Mentorship

Thank you (Asante)

HIS project through an NIH D43 grant

HARVARD
SCHOOL OF PUBLIC HEALTH

Alcohol use, Risky Alcohol Drinking and Associated Factors among Adults Living with HIV in Urban Tanzania

Belinda J. Njiro

Background

- Alcohol use disorders (AUD) are among the most prevalent mental health disorders worldwide: among people living with HIV, the pooled prevalence of AUD worldwide is 29.8% (1).

- Alcohol use and AUD are associated with health, social, and psychological complications and may particularly interfere with the treatment of chronic conditions including HIV/AIDS (2).
- Specifically for PLHIV, Alcohol use is associated with
  - High risk sexual behaviour further increasing the risk of HIV and STI transmission
  - Isolation and decreased care-seeking behaviors
  - Rapid HIV/AIDS disease progression
  - Increased risk of opportunistic infections
  - Poor ART adherence increasing the risk of developing drug-resistant strains

1. Duko B, Ayalew M, Ayano G. The prevalence of alcohol use disorders among people living with HIV/AIDS: A systematic review and meta-analysis. Subst Abus Treat Prev Policy. 2019;14(1):1–9.
2. Francis JM, Weiss HA, Mshana G, Baisley K, Grosskurth H, Kapiga SH. The epidemiology of alcohol use and alcohol use disorders among young people in Northern Tanzania. PLoS One. 2015;10(10):1–17.

Why addressing Alcohol use in PLHIV

- The need to understand the burden and driving factors for Alcohol Use
- Scarce evidence on alcohol use and AUD among PLHIV in Tanzania
- Lack of tailored interventions for AUD harm reduction

Objectives

Estimate the burden of Alcohol use and risky alcohol drinking among adults living with HIV in urban Tanzania

Determine factors associated with alcohol use and risky alcohol drinking among adults living with HIV in urban Tanzania

Methods

- Secondary analysis of baseline data of a non-inferiority cluster randomized controlled trial conducted in Dar es Salaam in 2017
- The trial included 48 HIV care and treatment facilities (clusters) in three municipalities
- Recruited 2172 adults aged 18 years or older living with HIV
- 771 (41.9%) participants responded to Alcohol use questions in the last 12 months (AUDIT C)
- Descriptive statistics
- Univariate and multivariable log-binomial regression(glm) were used to estimate crude and unadjusted risk ratios.
- The multivariable model method included variables with p-value <0.2 in the univariable models and key confounders

Study variables

Covariates

- Socio-demographic characteristics
- HIV and ART duration
- Self-reported ART adherence
- HIV disclosure status
- HIV viral load
- CD4 counts

Outcome: Alcohol Use and Risky alcohol drinking (AUDIT-C)

How often do you have a drink containing alcohol?				
Never (0 points)	Monthly or less (1 point)	Two to four times per month (2 points)	Two to three times per week (3 points)	Four or more times per week (4 points)
How many alcoholic drinks do you have on a typical day where you are drinking?				
1-2 (0 points)	3-4 (1 point)	5-6 (2 points)	7-9 (3 points)	10 or more (4 points)
How often do you have 6 or more alcoholic drinks on a single occasion?				
Never (0 points)	Less than monthly (1 point)	Monthly (2 points)	Weekly (3 points)	Daily or almost daily (4 points)

Alcohol Use: Any alcohol consumption in the last 12 months

Risky alcohol drinking: Total score of ≥ 3 for females | ≥ 4 for males

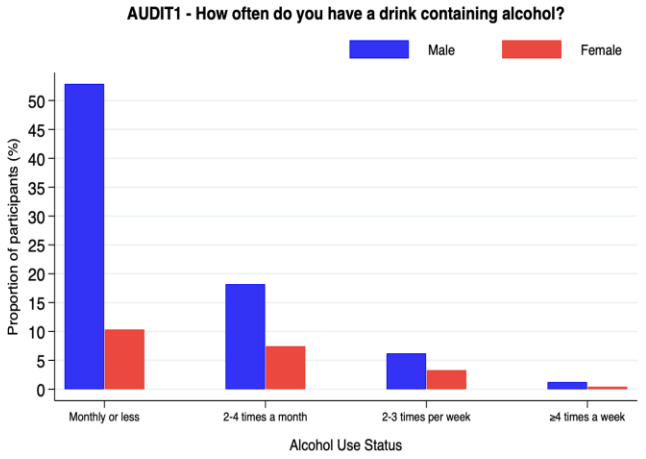
Results - Prevalence

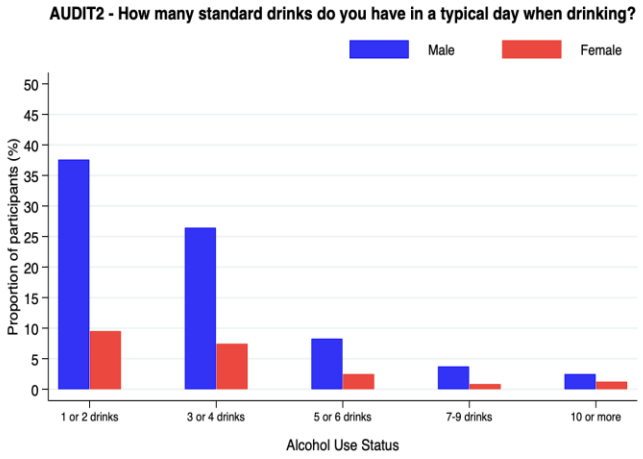
771 Adults living with HIV

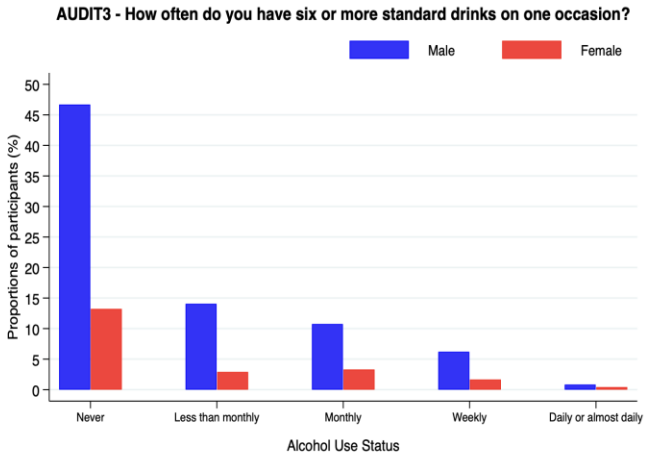
Alcohol Use in the last 12 months: 242 (31.4%)

Not-at-risk drinkers: 132

At risk drinkers: 110 (45.5%)







	Alcohol Use			
Variables	**Yes (N=242)**	**No (N=529)**	**Total**	**p-value**
Sex				**0.049**
Female	190 (29.9)	446 (70.1)	636	
Male	52 (38.5)	83 (61.5)	135	
Age groups (years)				0.19
18-24	8 (25.8)	23 (74.2)	31	
25-49	210 (32.8)	431 (67.2)	641	
>49	24 (24.2)	75 (75.8)	99	
Education Level				0.89
None	12 (36.4)	21 (63.6)	33	
Preschool to Secondary	225 (31.2)	495 (68.8)	720	
Post-secondary/College	3 (25.0)	9 (75.0)	12	
Marital Status				0.41
Single/Never Married	72 (33.0)	146 (67.0)	218	
Currently Married/Living with Partner	106 (28.6)	265 (71.4)	371	
Previously married/lived with partner	61 (35.1)	113 (64.9)	174	
Occupation				**0.001**
Currently working	221 (33.6)	437 (66.4)	658	
Not currently working	21 (18.6)	92 (81.4)	113	

Univariate analysis

Variables	Alcohol Use		Total	p-value
	Yes (N=242)	No (N=529)		
Time since HIV diagnosis				0.56
<2 years	38 (32.5)	79 (67.5)	117	
2-5 years	46 (35.9)	82 (64.1)	128	
>5 years	33 (28.0)	85 (72.0)	118	
Time on ART				0.22
<6 months	23 (34.8)	43 (65.2)	66	
6-12 months	17 (43.6)	22 (56.4)	39	
>12 months	117 (32.0)	249 (68.0)	366	
HIV Viral Load (copies/ml)				0.81
< 1000	134 (30.9)	299 (69.1)	433	
>=1000	25 (34.7)	47 (65.3)	72	
CD4 T-cell (counts/ml)				**<0.001**
<200	9 (28.1)	23 (71.9)	32	
200-<500	30 (33.0)	61 (67.0)	91	
>=500	96 (41.4)	136 (58.6)	232	
HIV Disclosure				0.93
No	22 (31.9)	47 (68.1)	69	
Yes	220 (31.3)	482 (68.7)	702	
Self-reported ART adherence				0.19
Poor to Very Poor	1 (11.1)	8 (88.9)	9	
Moderate/Fair	7 (18.9)	30 (81.1)	37	
Good to Very Good	229 (32.2)	482 (67.8)	711	

Univariate analysis...

Patient characteristics	Adjusted RR	95% CI	p-value
Sex			
Female	Ref.	Ref.	**0.018**
Male	1.34	1.05 – 1.70	
Age			
18-24	Ref.	Ref.	
25-49	1.25	0.68 – 2.29	0.470
>49	0.89	0.44 – 1.78	0.736
Occupation			
Currently working	Ref.	Ref.	
Not currently working	0.62	0.42 – 0.92	**0.018**
HIV Duration			
< 2 years	Ref.	Ref.	
2-5 years	1.19	0.84 – 1.68	0.318
>5 years	0.92	0.62 – 1.36	0.678
HIV Viral load			
< 1000	Ref.	Ref.	
>=1000	1.18	0.85 – 1.65	0.318
CD4 counts			
<200	Ref.	Ref.	
200-499	1.03	0.55 – 1.92	0.935
>=500	1.39	0.78 – 2.48	0.267
Self-reported adherence			
Good	Ref.	Ref	
Moderate	0.63	0.32 – 1.24	0.183
Poor	0.33	0.05 – 2.08	0.238

Alcohol use Multivariable regression

Patient characteristics	Adjusted RR	95% CI	P-value
Sex			
Male	Ref.	Ref.	0.321
Female	1.03	0.65 – 1.63	
Age			
18-24	Ref.	Ref.	
25-49	0.83	0.39 – 1.78	0.639
>49	0.98	0.16 – 1.21	0.112
HIV Duration			
< 2 years	Ref.	Ref.	
2 -5 years	0.74	0.39 – 1.39	0.350
>5 years	0.84	0.45 – 1.58	0.602
HIV Viral load			
< 1000	Ref.	Ref.	
>=1000	1.08	0.58 – 2.02	0.799
HIV Disclosure			
Yes	1.39	0.67 – 2.87	0.373
No	Ref.	Ref.	
Self-reported adherence			
Good	Ref.	Ref.	
Moderate	0.55	0.18 – 1.66	0.288
Poor	0.70	0.11 – 4.49	0.709

Risky drinking Multivariable regression

Implications

- One-third reported AU and 45.5% are classified as risky drinkers and 1.2% as HED
- Our findings highlighted a higher prevalence of risky alcohol drinking compared to studies in rural setting
- AUD estimates are higher than the global prevalence of AUD reported at 29.8% in 2019 (24.5% in developing countries)
- Male preponderance in AU and AUD
- Occupation: the role income and engagement in AU

Limitations

Small sample and missing data

Potential underreporting among those responded to alcohol screening questions and possibly non-responders

Males were under-represented in the study

Conclusion

The burden of AUD is increasing among PLHIV in urban Tanzania

Males are at an increased risk

Recommendation for Interventions targeting alcohol use and AUD among PLHIV in primary care settings

Need for larger studies using objective measures such as alcohol biomarkers

HIS Fellowship Progress

Manuscript Revision and submission for publication by next month

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Manuscript #	NATMH-24-1075
Current Revision #	0
Submission Date	8th Sep 24
Current Stage	Manuscript under consideration
Title	Efficacy of Cognitive Behavior Therapy for Antiretroviral Therapy Adherence and Treatment Outcomes among People Living with HIV: A Systematic Review and Meta-analysis
Manuscript Type	Review Article
Collection	N/A
Corresponding Author	Dr David Richer Araujo Coelho (daraujocoelho@mgh.harvard.edu) (Harvard T.H. Chan School of Public Health)
Contributing Authors	Dr Belinda Njiro , Dr Mashavu Yussuf , Dr Wigilya Mikomangwa , Dr Willians Vieira , Dr Stefania Papatheodorou , Dr Paul Bain , Dr Bruno Sunguya , Dr Mary Sando , Dr Carolina Coutinho , Dr Valdilea Veloso , Dr Beatriz Grinsztejn , Dr Muhammad Bakari , Dr Christopher Sudfeld , Dr Wafaie Fawzi , Dr Kenneth Mayer , Dr Sari Reisner , Dr Alex Keuroghlian
Authorship	Yes
Abstract	Cognitive behavior therapy (CBT) has emerged as a promising intervention to enhance antiretroviral therapy (ART) adherence among people living with HIV (PLWH). This systematic review and meta-analysis evaluated the efficacy of CBT on ART adherence, HIV viral load (HVL), viral suppression, and CD4 counts. A total of 20 randomized controlled trials involving 1,739 PLWH were included. CBT was associated with improved ART adherence (Cohen's d=0.28, 95% CI: 0.06, 0.50, p=0.013), with more pronounced effects for PLWH with psychiatric comorbidities (Cohen's d=0.47, 95% CI: 0.15, 0.79, p=0.004) and in studies conducted in low- and middle-income countries (LMIC) (Cohen's d=0.75, 95% CI: 0.37, 1.12, p<0.001). No statistically significant findings were observed for HVL, viral suppression, or CD4 counts. These findings support the efficacy of CBT in enhancing ART adherence, particularly for those with psychiatric comorbidities and in LMICs. However, the impact of CBT on HVL, viral suppression, and CD4 counts remains inconclusive.
Subject Terms	Scientific community and society/Social sciences/Psychology Health sciences/Diseases/Infectious diseases/HIV infections

Acknowledgements

- Mentors and HIS Project PIs: Professors Bruno Sunguya, Christopher Sudfeld, Muhammad Bakari, and Wafaie Fawzi

- Partner institutions: Muhimbili University of Health and Allied Sciences (MUHAS), Havard T.H. Chan School of Public Health, Management and Development for Health (MDH)

HARVARD T.H. CHAN
SCHOOL OF PUBLIC HEALTH

Trial of an mHealth intervention to improve HIV prophylaxis for female sex workers, United Republic of Tanzania

A Symposium on Progress Made in Building Capacity for HIV/AIDS Implementation Science in Tanzania: 17th January, 2025

Christopher H Mbotwa, Method R Kazaura, Kåre Moen, Christopher R Sudfeld, Emmy Metta, Melkizedeck T Leshabari, Muhammad Bakari, Elia J Mmbaga

UNIVERSITY OF OSLO

HEKIMA NI UHURU

Bulletin of the World Health Organization

Bull World Health Organ. 2024 Oct 29;102(12):852–860. doi: 10.2471/BLT.24.291516

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Trial of an mHealth intervention to improve HIV prophylaxis for female sex workers, United Republic of Tanzania

Christopher H Mbotwa [a,✉], Method R Kazaura [a], Kåre Moen [b], Christopher R Sudfeld [c], Emmy Metta [d], Melkizedeck T Leshabari [d], Muhammad Bakari [e], Elia J Mmbaga [b]

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PMCID: PMC11601177 PMID: 39611190

Objective To evaluate the effect of a mobile health (mHealth) intervention on early retention of female sex workers in human immunodeficiency virus (HIV) pre-exposure prophylaxis services in the United Republic of Tanzania.

Methods The study involved 783 female sex workers: 470 from Dar es Salaam who were given the *Jichunge* mHealth application (app) in addition to standard HIV pre-exposure prophylaxis (intervention arm), and 313 from Tanga who received pre-exposure prophylaxis alone (control arm). Participants were recruited using respondent-driven sampling and followed up for 12 months. Early retention was defined as attending a pre-exposure prophylaxis follow-up clinic within 28 days of an appointment scheduled for 1 month after starting treatment. To assess if the *Jichunge* app led to higher retention, we conducted intention-to-treat and per-protocol analyses using a regression model adjusted by inverse probability weighting.

Findings Early retention in HIV pre-exposure prophylaxis care was observed in 27.6% (130/470) of participants in the intervention arm and 20.1% (63/313) in the control arm. In the adjusted, intention-to-treat analysis, early retention was observed in 29.4% in the intervention arm and 17.7% in the control arm (risk difference: 11.8 percentage points; 95% confidence interval: 5.3–18.3).

Conclusion Early retention in HIV pre-exposure prophylaxis care was significantly greater among female sex workers in the United Republic of Tanzania who used the *Jichunge* app than in those who did not. Nevertheless, more than two thirds of sex workers using the application did not attend follow-up services after 1 month, suggesting that additional interventions are needed.

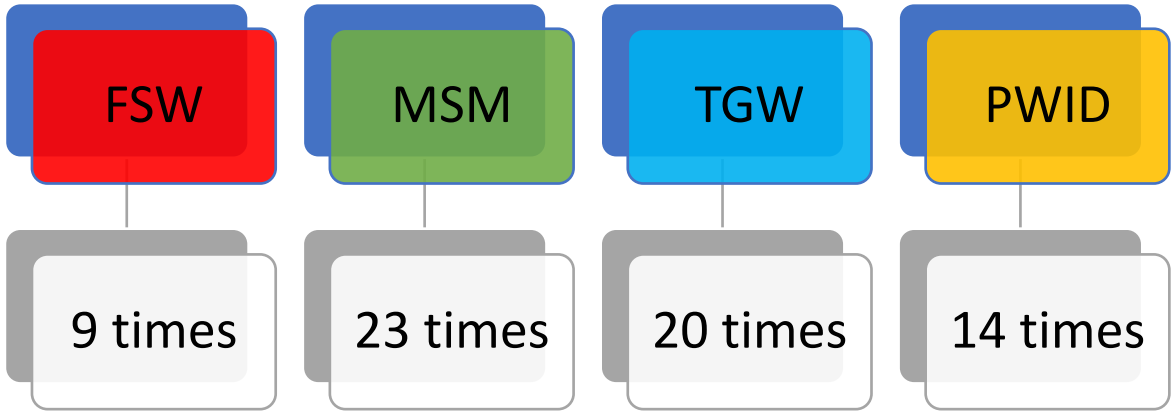
Burden of HIV among Key Population

- Globally, more than half (55%) of new infections occurred among KP in 2022 (25% in SSA)

✓ Female sex workers and their clients accounted for 18% (8% in SSA).

- Prevalence of 15.3% among female sex workers in Dar es Salaam (***Mizinduko et al, 2020)***

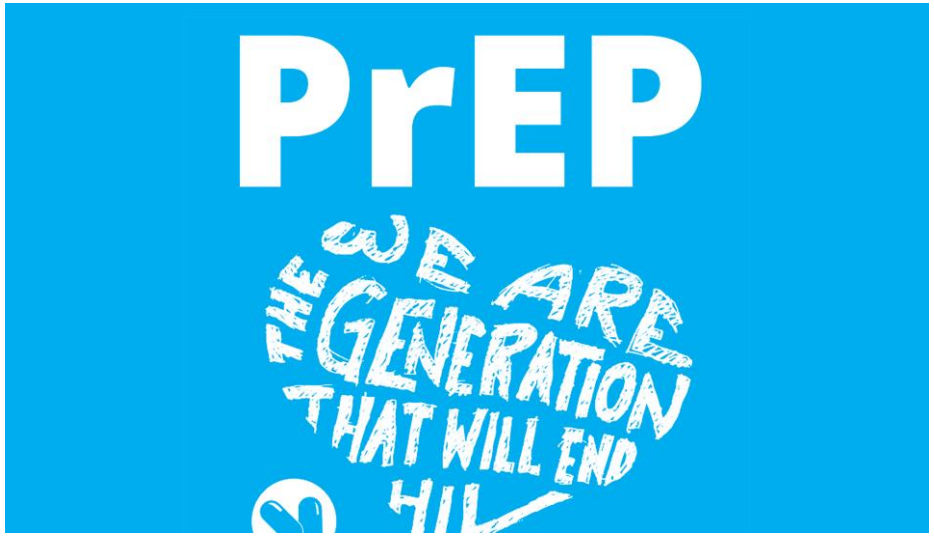
Relative risk of getting HIV among key population compared to the rest of population



Source: UNAIDS, 2024

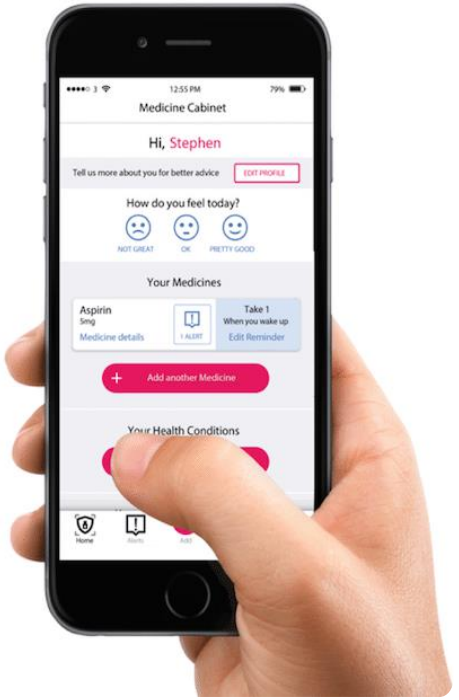
Pre-Exposure Prophylaxis

- Pre-exposure prophylaxis (PrEP) has been shown to be effective in preventing HIV (***Jiang et al, 2014).***
- In Tanzania, PrEP roll-out started in 2021.
- Low retention in PrEP services is a major challenge (***Koss et al, 2020; Kagaayi et al, 2020)***



Mobile Health (mHealth) interventions

- mHealth has been shown to improve PrEP use in high income countries such as United States (***Liu et al., 2019)***
- Limited evidence on the use and effectiveness of mHealth in promoting PrEP in sub-Saharan Africa.



Objective

To evaluate the effectiveness of *Jichunge* mHealth intervention in promoting retention in PrEP services among female sex workers in Dar es Slaam, Tanzania.

Methods: Designs, participants and data sources

Study Design: Pragmatic quasi-experimental trial (part of PREPTA project); **quantitative** approach.

- Two arms: Intervention (Dar es Salaam); Control (Tanga)

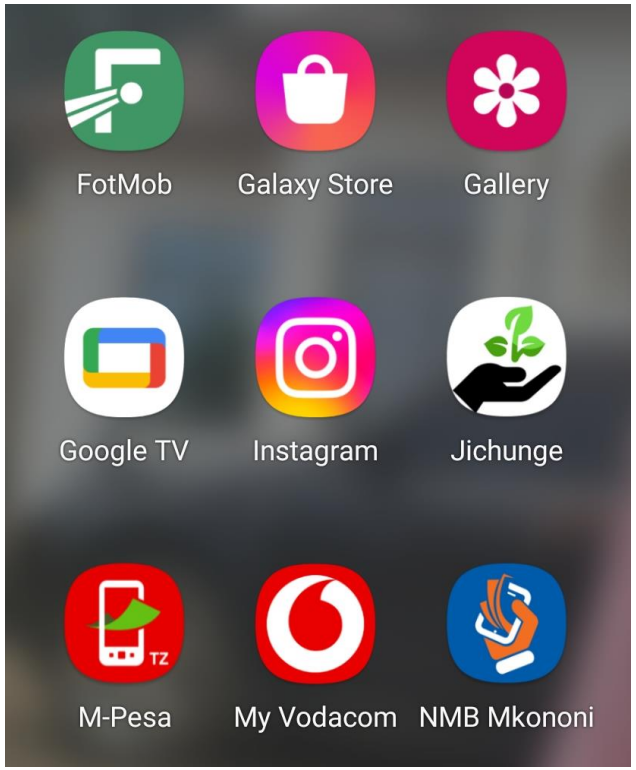
Study Population: female sex workers (aged 18+, HIV-, live in Dar or Tanga, starting PrEP).

Sample size and sampling:

- 783 female sex works (470 in Dar and 313 in Tanga)
- Respondent Driven sampling (RDS)

Data sources

- Questionnaire
- Health records
- *Jichunge* app



Pill registration functionality
- Streak line for pill registration
- Click to register today's pill

Consultation functionality
- Consult a doctor
- Consult a peer educator

Discussion forum
- Discuss with peers

Editorial contents functionality
- Learn about PrEP
- Competitions to win prize
- Health services information

Statistical analyses

Outcome: 1-month retention in PrEP

Exposure: Jichunge mHealth intervention

Confounders: Baseline characteristics

Controlling of confounders: IPW estimated from propensity score model

- ✓|SMD|<0.1

Effect of Jichunge mHealth app

- ✓ATE: Absolute risk difference (RD)
- ✓Relative risk: Log-binomial
- ✓ITT and PP

Results

- Mean age (27±6 years)
- Baseline covariates Balanced (|SMD|<0.1)

Table 1: Weighted distribution of baseline characteristics

Variable	Comparison n (%)	Intervention n (%)	SMD
Age (years)	26.7 ± 6.0	26.9 ± 5.6	0.027
Secondary or above education	172 (55.4)	247 (52.9)	-0.050
Never married	236 (75.9)	346 (74.0)	-0.044
Living some family member	217 (69.8)	325 (69.6)	-0.005
Had children	234 (75.2)	360 (76.9)	0.041
No other income source than sex work	183 (58.8)	269 (57.5)	-0.026
Had steady partner	166 (53.5)	253 (54.1)	0.012
Used a condom the last time had sex with the client	145 (46.5)	229 (48.9)	0.047
Accepts sex without a condom for increased pay	172 (55.4)	270 (57.8)	0.050
Financial difficulties due to healthcare spending	155 (49.7)	224 (48.0)	-0.035
physical violence in the past 12 months	108 (34.9)	183 (39.2)	0.090
Perceived at high HIV risk	232 (74.5)	337 (72.2)	-0.053
High PrEP awareness	136 (43.8)	215 (46.0)	0.044
Inadequate social support	176 (56.6)	267 (57.2)	0.010
Perceived sex work stigma	32.0 ± 3.7	31.7 ± 7.2	-0.049
Perceived PrEP stigma	25.2 ± 7.7	25.5 ± 7.6	0.036
PrEP behavioural skills	27.2 ± 3.3	27.2 ± 3.1	0.006

Table 2: Estimates of the effect of *Jichunge* app on retention in PrEP care

	Effect measure	Point estimate: (95% CI)	p-value
ITT analysis (Unadjusted)	Retention rate (intervention)	27·6% (23·6%,31·7%)	NA
	Retention rate (control)	20·1% (15·7%,24·6%)	NA
	Risk difference (RD)	7·5% (2·5%, 13·5%)	0·016
	Risk ratio (RR)	1·37 (1·05,1·79)	0·019
ITT analysis (IPW adjusted)	Retention rate (intervention)	29·4% (24·8%, 34·1%)	NA
	Retention rate (control)	17·7% (13·2%, 22·3%)	NA
	Risk difference (RD)	11·8% (5·3%, 18·3%)	<0·001
	Risk ratio (RR)	1·67 (1·23, 2·28)	0·001
PP analysis (IPW adjusted)	Retention rate (intervention)	36% (3·1%, 42%)	NA
	Retention rate (control)	18·3% (13·8%, 22·8%)	NA
	Risk difference (RD)	17·8% (10·3%, 25·2%)	<0·001
	Risk ratio (RR)	1·97 (1·45, 2·69)	<0·001

Conclusions and recommendations

Conclusion

- The Jichunge mHealth app improved early retention in PrEP care.
- More than two-thirds of female sex workers did not engage in the services at 1-month, underscoring the need of supplementary interventions.
- smartphone-based mHealth interventions hold the potential to promote retention in PrEP services among HIV at-risk populations in East Africa and beyond.

Recommendations

- mHealth interventions should be considered when developing guidelines on HIV prevention.
- Further research: Long-term effect; Implementation research

Acknowledgement

- Fogarty International Center of the National Institutes of Health – HIV Implementation Science (HIS) Training Grant.
- Muhimbili University of Health and Allied Sciences (MUHAS).
- Harvard T.H. Chan School of Public Health (HSPH).
- The Research Council of Norway – Pragmatic Trial for HIV Pre-Exposure Roll-out in Tanzania (PREPTA).
- University of Oslo (UiO).