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SCHOOL OF PUBLIC HEALTH

Harvard-Tanzania Research and Training Collaboration

Wafaie Fawzi

January 20, 2022

History

Over the past 30 years, the Harvard-Tanzania collaboration has grown through large discovery and translational research platforms and dedicated training programs.

Harvard-Tanzania Research Focus Areas

We take a multi-disciplinary, team science approach to understand the epidemiology, economics, and politics related to public health problems. Our works focuses on discovery and translation of interventions to improve health locally and globally.

Priority Research Areas:

- Nutrition
- Maternal and Newborn health
- HIV, TB, and Malaria
- Chronic non-communicable diseases
- Adolescent health

The PEPFAR Program enabled translation of evidence to action and a commitment to capacity building

- Harvard has been a partner in the implementation of the US President's Emergency Plan for AIDS Relief (PEPFAR) in Tanzania as a Track 1.0 partner started in 2004
- Helped to establish two Tanzanian organizations:
  - Management and Development for Health (MDH) to support clinical treatment and research
  - Africa Academy for Public Health (AAPH) to enhance training and capacity building in Tanzania

Management and Development for Health (MDH)

- Harvard supported MDH's site-level engagement with 97 HIV care and treatment centers, 212 PMTCT facilities, and 45 TB/HIV sites (~150,000 participants)
- In 2010, Harvard assisted MDH's transition to become an independent, locally chartered NGO
- At that time, Harvard redirected efforts in order to build MDH's capacity to become the primary provider of HIV prevention, care, and treatment services.

"MDH leads the way in nutritional assessment and management as part and parcel of HIV care and treatment package."

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Africa Academy for Public Health
Research | Training | Practice

Africa Academy for Public Health

An independent organization established in 2009 and registered in Tanzania, with the mission to advance public health priorities of sub-Saharan Africa through collaborative research, training, capacity building, and knowledge translation.

AAPH Objectives

- Provide high-quality research and leadership training to health professionals in sub-Saharan Africa
- Conduct implementation science research to generate evidence for policy change around key public health priority issues: reproductive and maternal health; child and adolescent health; nutrition and agriculture; HIV/AIDS; TB; malaria; non-communicable diseases; health systems strengthening
- Facilitate translation of scientific evidence into practice
- Strengthen networks and linkages for scientific training and research initiatives within higher learning, research, and health institutions in sub-Saharan Africa

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The current work continues in close collaboration with

- Africa Academy for Public Health (AAPH)
- Management and Development for Health (MDH)
- Muhimbili University of Health and Allied Science (MUHAS)
- University of Dodoma (UDOM)
- Ifakara Health Institute (IHI)
- Sokoine University of Agriculture
- Ministry of Health
- Dar es Salaam City Council
- ZAPHA+ Zanzibar

Africa Academy for Public Health
Research | Training | Practice

IFAKARA HEALTH INSTITUTE
research | training | services

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES - MUHAS
Tanzania's Premier in Health Training, Research and Consultancy Services

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Three Decades of Productive Research Collaborations

n=49 completed studies

n=13 ongoing studies

n > 500 publications

Harvard-Tanzania
Results from Selected Research

Focus on Adolescent Health

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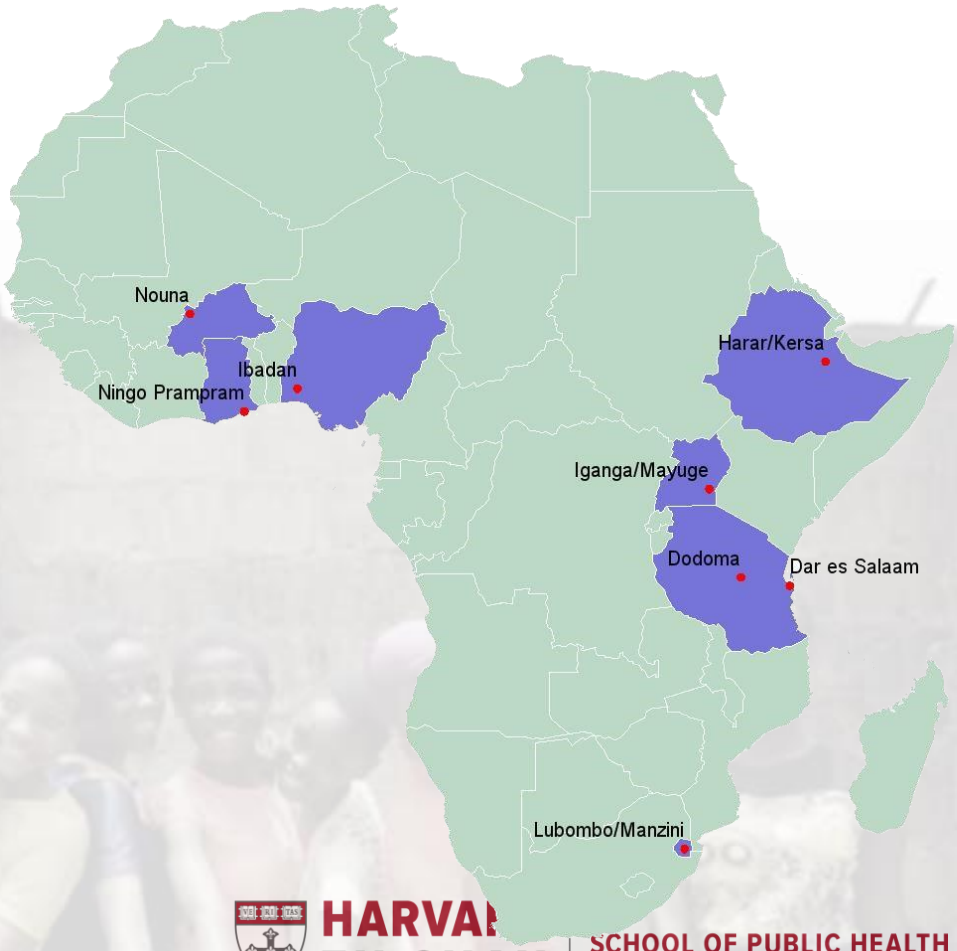
Status of Adolescent Health

- Globally over 1.1 million adolescents died in 2016, mostly from preventable or treatable causes
- 16% of global population are adolescents (90% live in LMICs)
- Estimated 500 million school days lost due to illness each year in LMICs, contributing to significant school drop-out rates
- Sub-Saharan Africa is a key area for adolescent health research and interventions; by 2050 will have more adolescents than any other region

WHO, 2018; Bundy et al, 2018; UNICEF, 2012

ARISE Adolescent Health Survey
Community-based

- 9 sites, 7 countries
- Males and females aged 10-19
- Standardized questionnaire
- N = 8,075



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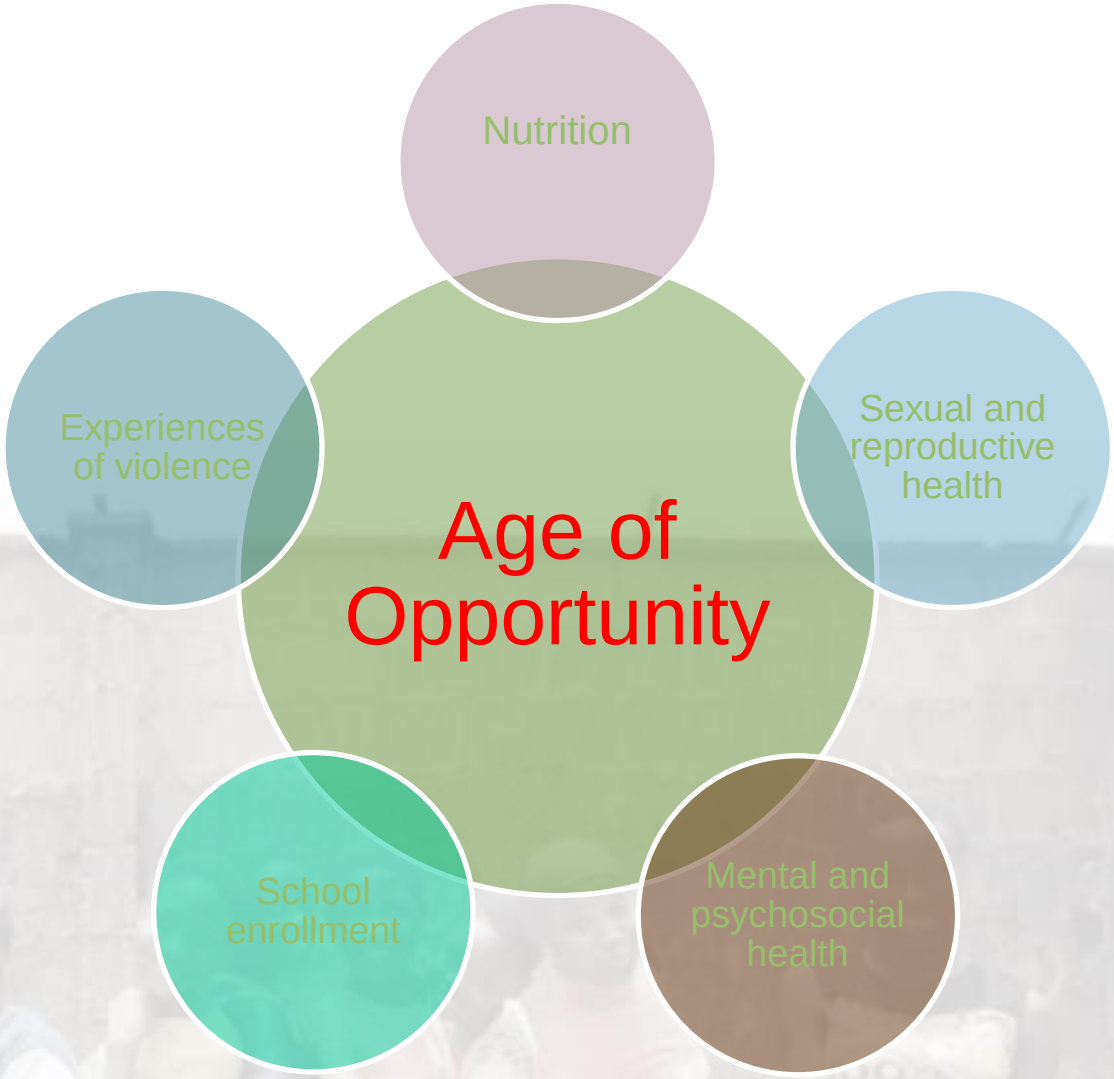
ARISE Adolescent Health Survey

- 14 manuscripts
  - 8 multi-site
  - 6 site-specific

- 5 broad subject areas



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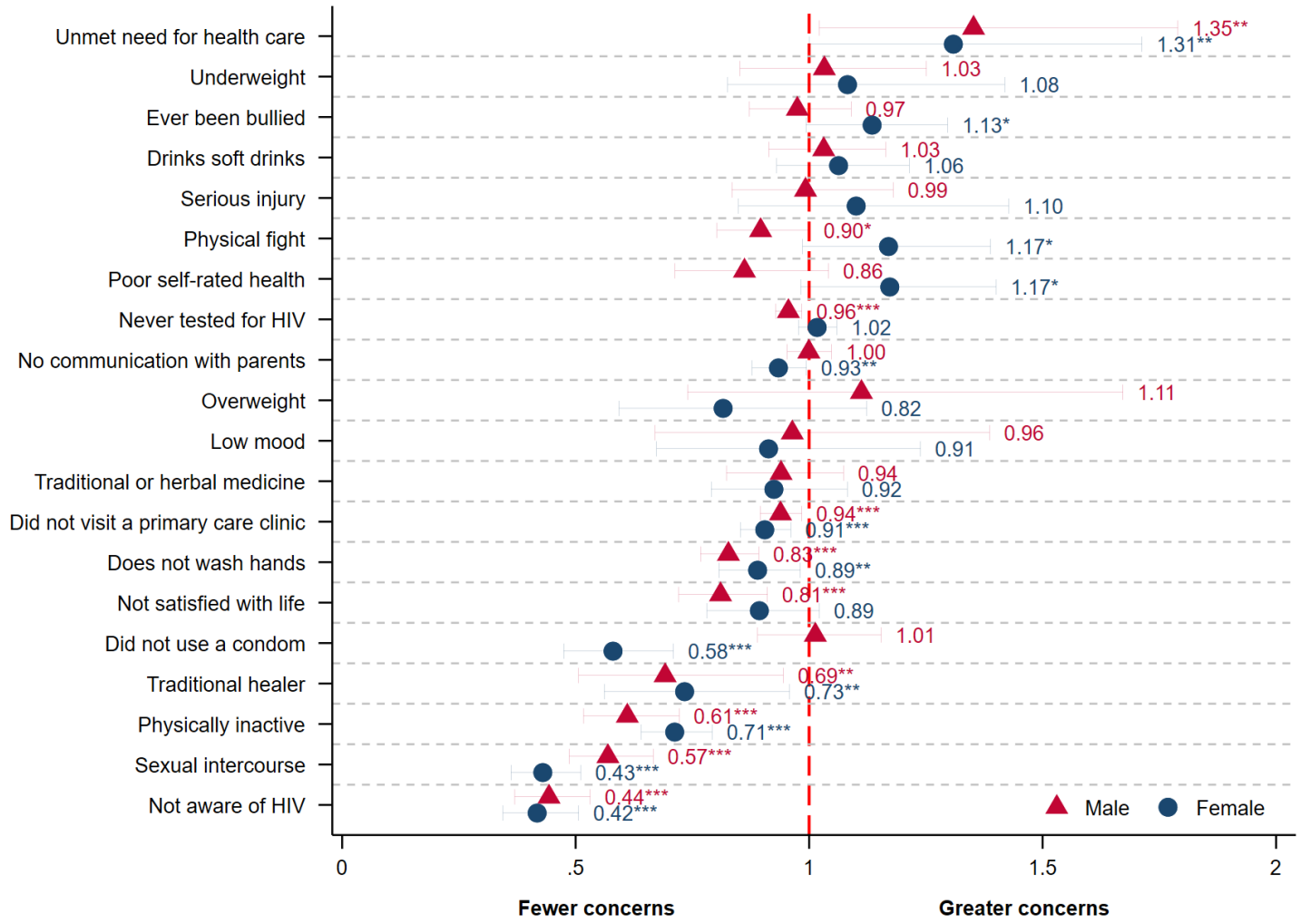
Gender differences in nutritional status, diet, physical activity

- Across sites, 14.3% underweight, 6.8% overweight and 18.1% stunting
- Female sex associated with:
  - Lower risk of underweight (pooled prevalence ratio 0.66, 95% CI 0.57, 0.77) and stunting (pooled PR 0.63, 95% CI 0.55, 0.71)
  - Higher risk of overweight (pooled PR 1.60, 95% CI 1.26, 2.06)
  - Lower likelihood of exercise for 1 h or more per day (pooled PR 0.77, 95% CI 0.67, 0.88)
- Sex is a key predictor of nutritional status among sub-Saharan African adolescents; gender-specific interventions may be required to reduce double burden of under- and overnutrition

Darling et al., Tropical Medicine and International Health, 2019.

Manuscript summary | School enrollment



De neve et al.

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ARISE COVID-19 Survey: Round 1

- Established a mobile survey platform to generate longitudinal data on knowledge, attitudes, and practices related to COVID-19 prevention and management and evaluate impact of COVID-19 on health and socioeconomic domains.
- Baseline survey July-November 2020 in 3 urban and 3 rural sites in Ethiopia, Burkina Faso, Nigeria
  - 900 healthcare workers sampled from professional associations
  - 1,795 adolescents aged 10-19 years and 1,797 adults aged 20 years or above sampled from existing surveys and Health and Demographic Surveillance Systems
  - Used Computer Assisted Telephonic Interviewing (CATI)

Manuscripts – Am J Trop Med Hyg June 2021

1) Knowledge and Practice Related to COVID-19 and Mental Health among Adults in Sub-Saharan Africa

2) The COVID-19 pandemic and adolescents' experience in sub-Saharan Africa: A cross-country study based on telephone surveys

3) Impact of COVID-19 on nutrition, food security and dietary diversity and quality in Burkina Faso, Ethiopia and Nigeria

4) COVID-19 knowledge, perception, preventive measures, stigma, and mental health among healthcare workers in three sub-Saharan African countries: A phone survey

5) Reported Barriers to Health Care Access and Service Disruptions due to COVID-19 in Burkina Faso, Ethiopia, and Nigeria: A Phone Survey

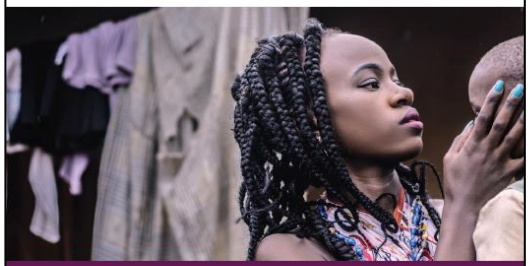
6) Design and field methods of the ARISE Network COVID-19 Rapid Monitoring Survey

Policy briefs

POLICY BRIEF

COVID-19: Knowledge, Practices, and Mental Healt

Key Findings from a Phone Survey of Adults in Burkina Faso, Ethic



OVERVIEW: The COVID-19 pandemic has impacted millions of lives globally, but l
of preventive practices related to COVID-19 in sub-Saharan Africa have been unc
of the pandemic are not fully known. To help fill these knowledge gaps and infor
Network undertook a multi-country survey to understand knowledge and practic
impacts of the crisis on households in sub-Saharan Africa.

COVID-19 AWARENESS

14% knew someone with COVID-19

95% of respondents believed the COVID-19 pandemic is real, and 14% knew someone who had been sick from COVID-19.

TRANSMISSION KNOWLEDGE

90% correctly identified main transmission methods

Most respondents correctly identified the main COVID-19 transmission methods, but over half believed in misconceptions such as transmission through mosquito bites. Being male, being older, having more education, residing in an urban area, and believing the pandemic is real were factors positively associated with knowledge of COVID-19 transmisson mechanisms.

PREVENTION KNOWLEDGE

91% correctly identified basic preventive methods

Most respondents could identify basic preventive measures, but the practice of preventive measures was lower, such as avoiding social gatherings or disinfecting contaminated surfaces. 32% believed drinking alcohol could prevent COVID-19, and many believed vitamins and lemon or ginger tea were also preventive.

MENTAL HEALTH

21% reported mild psychological distress

Mild, moderate, and severe psychological distress was reported by 20.6%, 5.9%, and 1.1% of participants, respectively. Overall, most participants were classified as having no anxiety or depression during this period.

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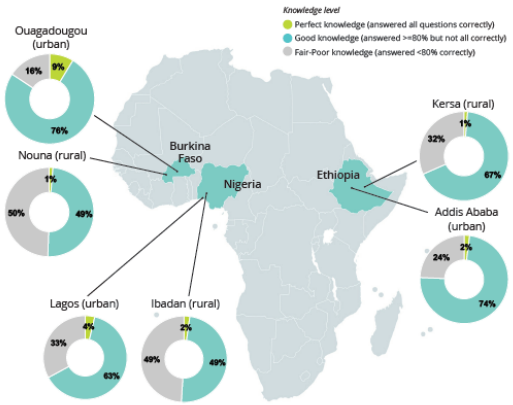
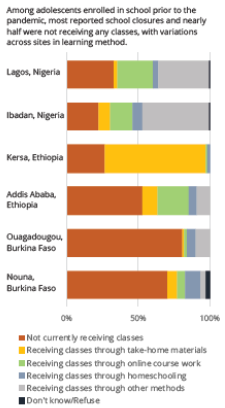
The A
surveys including new topics and additional countries over the coming months to continue building the evidence base on various impacts of COVID-19 in sub-Saharan Africa.

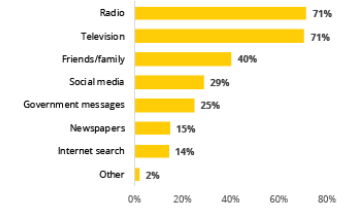
Adolescents' knowledge of COVID-19 symptoms, prevention measures, and transmission methods



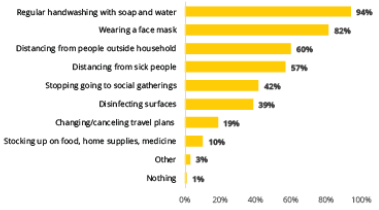
Adolescents' mode of learning during COVID-19



Adolescents' sources of information on COVID-19



Measures adolescents have taken to respond



Policy Recommendations

Understanding the impacts of the COVID-19 pandemic on the health and well-being of adolescents is crucial for the design of targeted interventions to mitigate both short- and long-term adverse impacts. Our findings underscore key policy prescriptions:

1. Urgent actions are needed to disseminate accurate information on COVID-19 to adolescents regarding the prevention of COVID-19 transmission in SSA, particularly in rural settings where awareness of the virus appears low.
2. Rapid and adaptive actions need to be taken to address access to and the quality of remote learning opportunities for adolescents, as many indicate a lesser ability to learn and expected difficulty in catching up.
3. Actions are needed to address the disruptive impacts of COVID-19 on school nutrition programs and the long-term effects of the pandemic on the diet and nutrition of adolescents, as many adolescents have experienced reduced intake of major food groups.

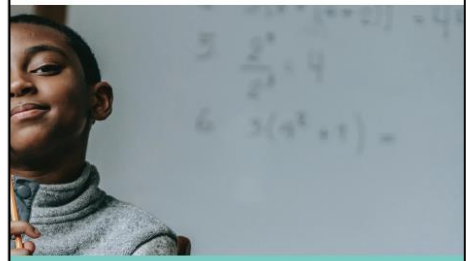
This study was undertaken by the Africa Research, Implementation Science, and Education (ARISE) Network and supported by the Bill and Melinda Gates Foundation, Heidelberg Institute of Global Health, and Harvard T.H. Chan School of Public Health. For more information, see Wang et. al., "The COVID-19 Pandemic and Adolescents' Experience in Sub-Saharan Africa: A Cross-Country Study Based on Telephone Surveys" (2021).

POLICY BRIEF

ARISE AFRICA RESEARCH, IMPLEMENTATION SCIENCE & EDUCATION NETWORK

Adolescents' Experience with COVID-19 in Sub-Saharan Africa

…rkina Faso, Ethiopia, and Nigeria



…hen crucial physical, mental, and social developments occur. While
…f COVID-19, measures put in place to combat the pandemic such as
…ave adverse effects on their health and development that can be hard to
…ulti-country effort to understand the impacts of the COVID-19 crisis on

…COVID-19 was real,
…56-89% of adolescents
… risk of exposure.
…es and transmission
…dge of symptoms.

…te) were not receiving
…ic. Most self-assessed
…ging from 44% in
…Burkina Faso and
…ould be very difficult
…n after COVID.

…hysical activity in the
…reporting no physical
…aying home more
…rning money. 30%
…ome during COVID.

…ere common,
…sumption of pulses,
… of fruits, 20% with
…bles, and 20% with
…-source foods.

STUDY BACKGROUND

The social, economic, and indirect health effects of COVID-19 and its containment efforts will be deep and long-lasting. To better understand these effects in sub-Saharan Africa, the ARISE Network is conducting rapid phone surveys with adults, adolescents, and healthcare providers.

In this survey, we interviewed 1,795 adolescents across one urban and one rural site in each of Burkina Faso, Ethiopia, and Nigeria. Our primary aim was to understand knowledge, perceptions, and practices related to COVID-19 and impacts of the pandemic on daily life. Households with adolescents aged 10-19 years old were sampled from Health and Demographic Surveillance Systems and other surveys. Computer-assisted telephone interviews (CATI) were conducted in local languages from July to November 2020.

The ARISE Network is conducting additional surveys including new topics and additional countries over the coming months to continue building the evidence base on various impacts of COVID-19 in sub-Saharan Africa.

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Adolescent Survey

FOOD & NUTRITION

31%
decreased their consumption of staples.

Decreases in food consumption were common, including 38% with decreased consumption of pulses, 31% with decreased consumption of fruits, 20% with decreased consumption of vegetables, and 20% with decreased consumption of animal-source foods.

COVID AWARENESS

18%
were not concerned about the spread of COVID.

5% of adolescents did not believe COVID-19 was real, and in Burkina Faso and Ethiopia 56-89% of adolescents perceived themselves at low or no risk of exposure. Knowledge of preventive measures and transmission methods was better than knowledge of symptoms.

DAILY ACTIVITY

28%
decreased their physical activity.

42% of adolescents reported no physical activity in the last week—nearly double the 24% reporting no physical activity before COVID. 62% were staying home more often, and 33% were no longer earning money. 30% had increased responsibilities at home during COVID.

EDUCATION

87%
were no longer going to school due to closures.

Many (ranging from 23-81% per site) were not receiving any education during the pandemic. Most self-assessed as having less ability to learn, ranging from 44% in Ouagadougou to 83% in Kersa. In Burkina Faso and Ethiopia, around half thought it would be very difficult to later catch up on their education after COVID.

Policy Recommendations

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ARISE COVID-19 Survey: Round 2

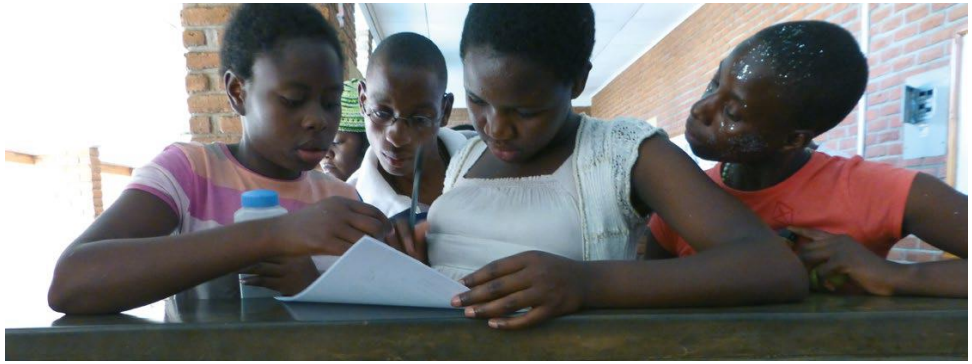
- Re-examine knowledge, attitudes and practices as well as pandemic impacts assessed in round 1 among the same participants in Ethiopia, Burkina Faso, Nigeria
- Extend survey to Tanzania and Ghana
- New survey modules for adults, adolescents and healthcare providers assessing vaccine perceptions and hesitancy
- Survey 2 completed, anticipated results by March 2022

Select Ongoing Trials

Focus on Adolescent Health

Using Schools as a Platform to Advance Adolescent Nutrition and Health

1. Comprehensive School Lunch and Gardening Programs
2. Micronutrient Supplementation Interventions
    - Weekly Iron and Folic Acid
    - Multiple Micronutrient Supplements



WHO Global Accelerated Action for the Health of Adolescents (AA-HA!), 2017

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MEGA Project

- Assess the impact of a community-based school intervention package on improving adolescent nutrition, health, and school attendance and retention

1. Meal Program (mid-day meal)
2. Education on Agriculture, Nutrition, and WASH
3. Garden at School
4. Community workshops and agricultural education

THE UNIVERSITY OF DODOMA
UDOM
Embracing Knowledge

AAPH Africa Academy for Public Health
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Scaling-up high-impact micronutrient supplementation interventions to improve adolescent nutrition and health (SAMIA)

Objectives

- Design, implement and evaluate a scalable school-based supplementation program for boys and girls enrolled in secondary school, with weekly IFA and/or daily MMS in Tanzania and Burkina Faso

- Create an enabling environment for program scale-up by assessing barriers to implementing national supplementation programs; strengthening advocacy and partnerships; and local capacity building

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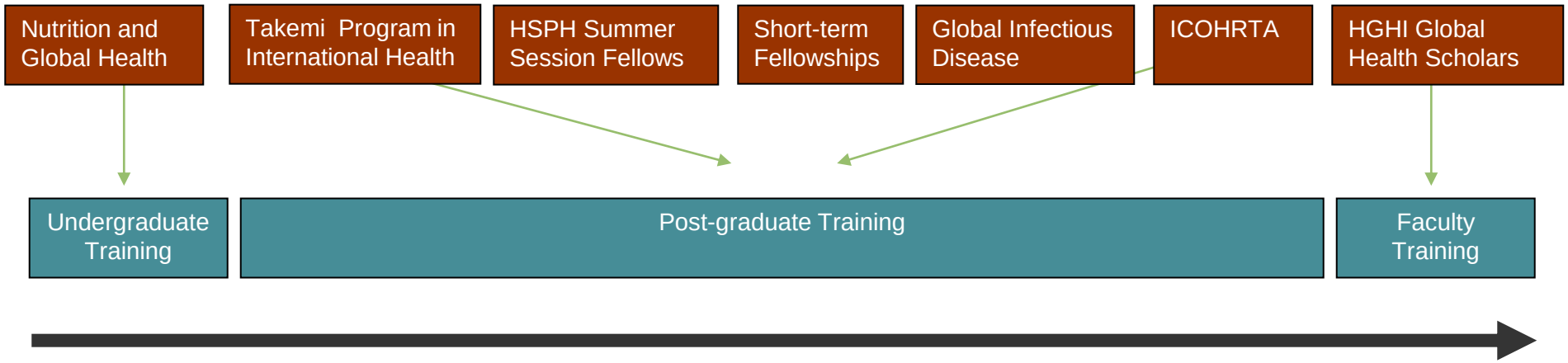
Harvard-Tanzania
Global Health Capacity Building
Training Programs

Current Harvard-Tanzania Training Programs

Span Across Stages of Academic Opportunity



Fostering sustainable research capacity has been a long-term goal and has resulted in:

- Degree training at HSPH (Master's and Doctoral)
- Post-doctoral training in innovative laboratory methods in virology, immunology, epidemiology, and biostatistics at Harvard
- Short-course training at HSPH and in Dar es Salaam in research methods, biostatistics, epidemiology, public health
- A south-to-south laboratory training program in collaboration with the Harvard-affiliated research group in Botswana

Training Programs

- To date, ten 5-year collaborative training programs through Harvard-Tanzania AAPH partnership
- Many supported by Fogarty International Center at NIH in partnership with MUHAS
- Current programs include:
  - HIV Implementation Science (HIS) Training Program
    - PIs: Fawzi, Mugusi and Barnighausen
  - Partnership for Global Health Research Training Program
    - PIs: Fawzi, Hamer, Perkins and Murphy

National Institutes of Health
Fogarty International Center
FOGARTY

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HIV Implementation Science (HIS) Training Program

Develop skilled researchers in Tanzania in:

- Implementation science, impact evaluation, and health systems research for HIV treatment
- Prevention of mother to child transmission (PMTCT)
- Nutrition interventions

Specific aims:

(1) Train a critical mass of mid-level and senior researchers to work as principal investigators and instructors in these areas

(2) Build a critical mass of junior public health and medical professionals who can design and successfully carry out rigorous research projects in these areas

(3) Develop a sustainable Master's program in HIV Implementation Science and Impact Evaluation in Dar es Salaam to train the next-generation of African HIV researchers

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Partnership for Global Health Research Training

Consortium of institutions supporting capacity building in LMICs and the U.S. to train the next generation of public health innovators and leaders to address priority public health challenges in Africa and Asia including:

- HIV/AIDS
- Non-communicable diseases
- Maternal and child health
- Nutrition
- Mental health

Program will develop a anetwork of early stage investigators from the U.S. and LMICs who are committed to careers in global health.

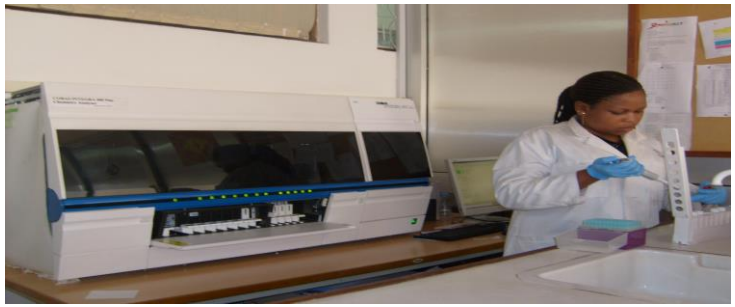
Partnership Goals

1) Recruit a diverse pool of qualified predoctoral and postdoctoral applicants from the global health and allied fields
2) Deliver a comprehensive education and research support program combining intensive in-person, cohort-based training with online learning and access to collaboration and networking tools to support trainee professional development and research project implementation
3) Provide trainees with rigorous mentored research experiences at LMIC research sites with a very strong track record of peer reviewed publications and NIH research outputs
4) Build LMIC and Global Health research capacity at consortium member institutions and internationally

Training Opportunities

- Boston
  - MS, MPH, or PhD Degrees
  - Short- and Long-term Fellowships
  - Summer Session Fellowships

- Dar es Salaam
  - Annual short courses / Annual Symposia
  - Research mini-grants
  - MPH or PhD degrees
  - Post-Doctoral Fellowships for trainees at MUHAS
  - Mentored research experience for medical or public health students
  - South-South collaborations



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Collaborative Training at HSPH

Training Type	Number Trained at HSPH
Doctoral Level Training	5
Masters Level Training	26
Post-doctoral Fellowships	36
Short-term Fellowships	18
HSPH Summer Session Scholars	72

Graduates return to Tanzania (99%). Alumni working in places like MDH, MUHAS, BUCHS, KCMC, IHI, CDC, the Ministry of Health and others.

Collaborative Training in Tanzania

Training Type	Number Trained in Tanzania
Short courses at MUHAS	3-4 courses conducted annually with approx. 20 participants/course
Internships for undergraduate Tanzanian Interns at AAPH	15 short term (8 week) and 2 long-term (1-2 years)

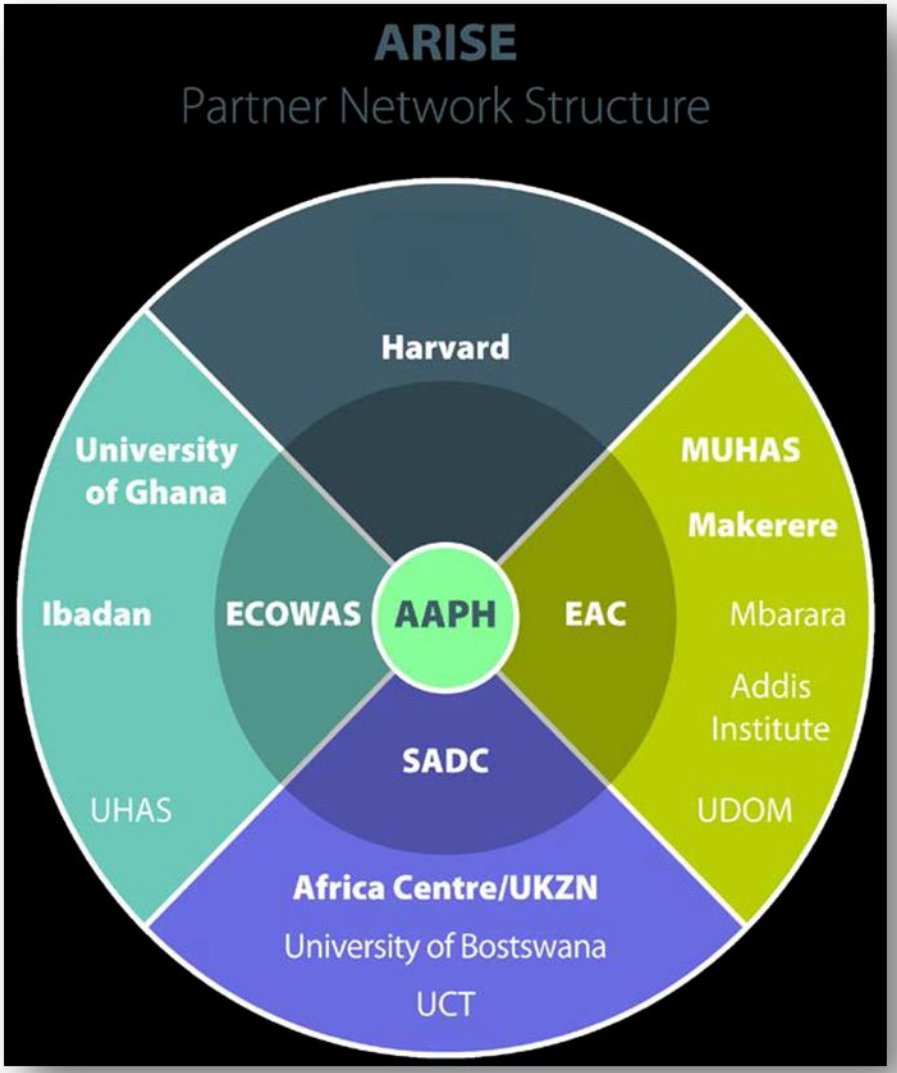
Ongoing training sessions as part of the capacity development of public health researchers and health care professionals.

Africa Research, Implementation Science and Education (ARISE) Network

Network for collaborative education and research activities in Africa, established by Harvard and AAPH over a series of meetings in 2014 and 2015

Includes prominent colleagues and collaborators from institutions and organizations across Africa

Builds upon the numerous ongoing training and research activities among participating institutions



ARISE Network Activities

Education:

- Introduction of new, innovative short courses at partner institutions through collaborative training; and co-teaching among junior faculty and postdoctoral fellows
- Strengthening PhD programs through advanced coursework, mentorship, and engagement throughout the network for research and training
- Collaborative 2-year post-doctoral training program with intensive mentorship
- Advanced training for research administrators

Research:

- Original research and pooling data from existing health demographic surveillance systems to help answer important research questions

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Harvard-Tanzania Global Health Collaboration

- Clear Track Record of High Quality Research
- Strong Infrastructure
- Multidisciplinary Team
- Commitment to Capacity Building

Thanks to our many investigators and collaborators!

Tanzania

Alfa Muhihi (AAPH)
Andrea Pembe (MUHAS)
Candida Moshiro (MUHAS)
Deo Mtasiwa (AAPH/MDH)
Ferdinand Mugusi (MUHAS)
Germana Leyna (MUHAS)
Gernard Msamanga (MUHAS)
Honorati Masanja (IHI)
Japhet Killewo (MUHAS)
Karim Manji (MUHAS)
Marina Njelekela (MUHAS)
Mary Mwanyika Sando (AAPH)
Nahya Salim (MUHAS)
Nzovu Ulenga (MDH)
Roderick Kisenge (MUHAS)
Said Aboud (MUHAS)
Said Vuai (Dodoma University)
Sylvia Kaaya (MUHAS)
Tumaini Nagu (MUHAS)

Harvard

Aisha Yousafzai
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Christopher Sudfeld
Emily Smith
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Mary Kay Smith-Fawzi
Molin Wang
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Till Baernighausen
Wafaie Fawzi
Walter Willett

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Thanks to our partners across 21 ARISE institutions

Botswana: The University of Botswana; Botswana–Harvard Partnership

Burkina Faso: Nouna Health Research Centre

Ethiopia: Addis Continental Institute of Public Health; Haramaya University

Germany: Heidelberg Institute of Global Health

Ghana: University of Ghana School of Public Health

Nigeria: University of Ibadan; AIDS Prevention Initiative in Nigeria

Rwanda: University of Global Health Equity; University of Rwanda

South Africa: University of Cape Town; University of KwaZulu-Nata; Africa Health Research Institute (AHRI)

Tanzania: Muhimbili University of Health and Allied Science; University of Dodoma; Management and Development for Health; Ifakara Health Institute

Uganda: Makerere University School of Public Health; Mbarara University of Science and Technology

Convening partners: Africa Academy for Public Health; Harvard T.H. Chan School of Public Health

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