



# 5<sup>th</sup> Annual Symposium of ARISE Network

Innovations in Adolescent Health:  
Research, Training, and Next Steps  
towards Success in the ARISE Network

Wafaie Fawzi  
January 19, 2024

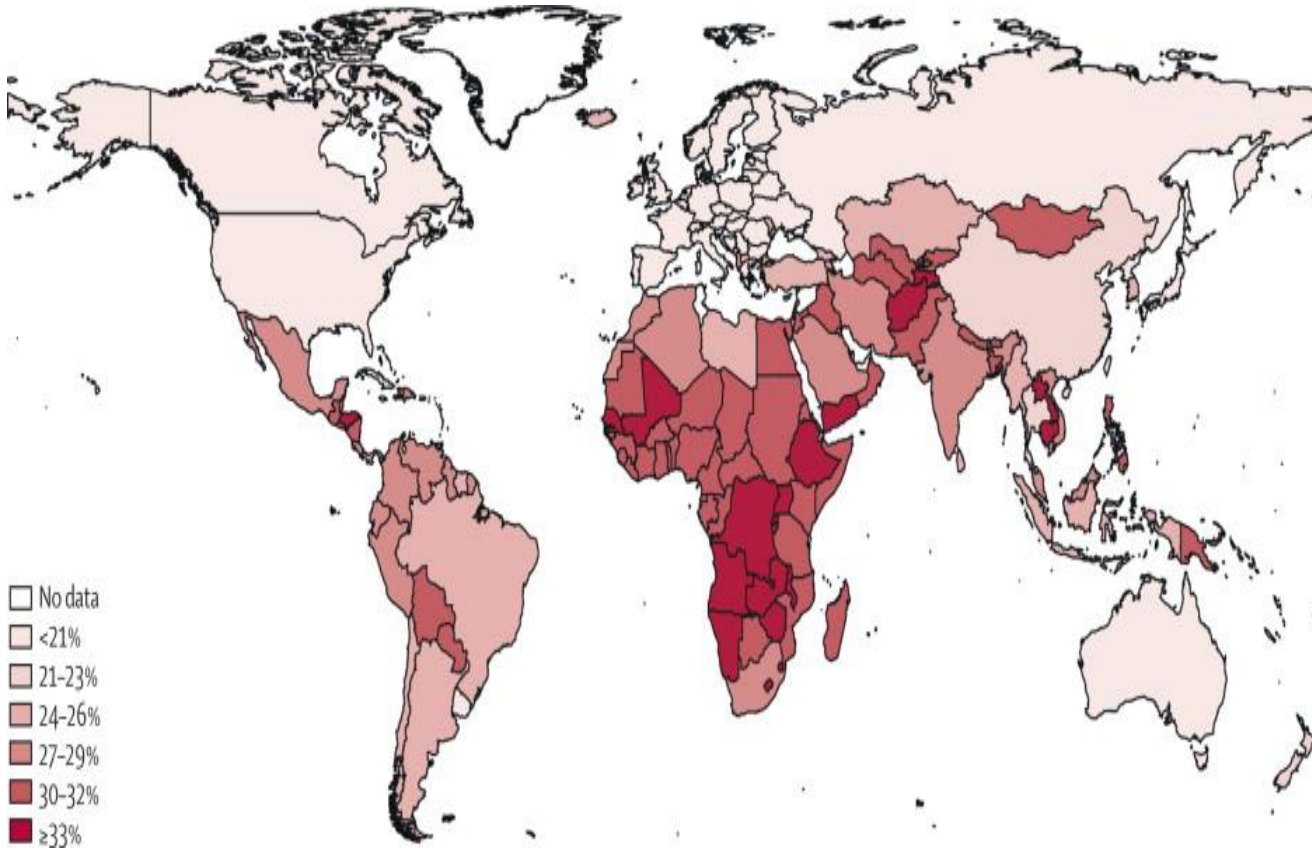


**HARVARD**  
**T.H. CHAN**

SCHOOL OF PUBLIC HEALTH



# Distribution of people aged 10-24 years



Source: UNICEF, 2023

Nine in ten adolescents live in LMICs

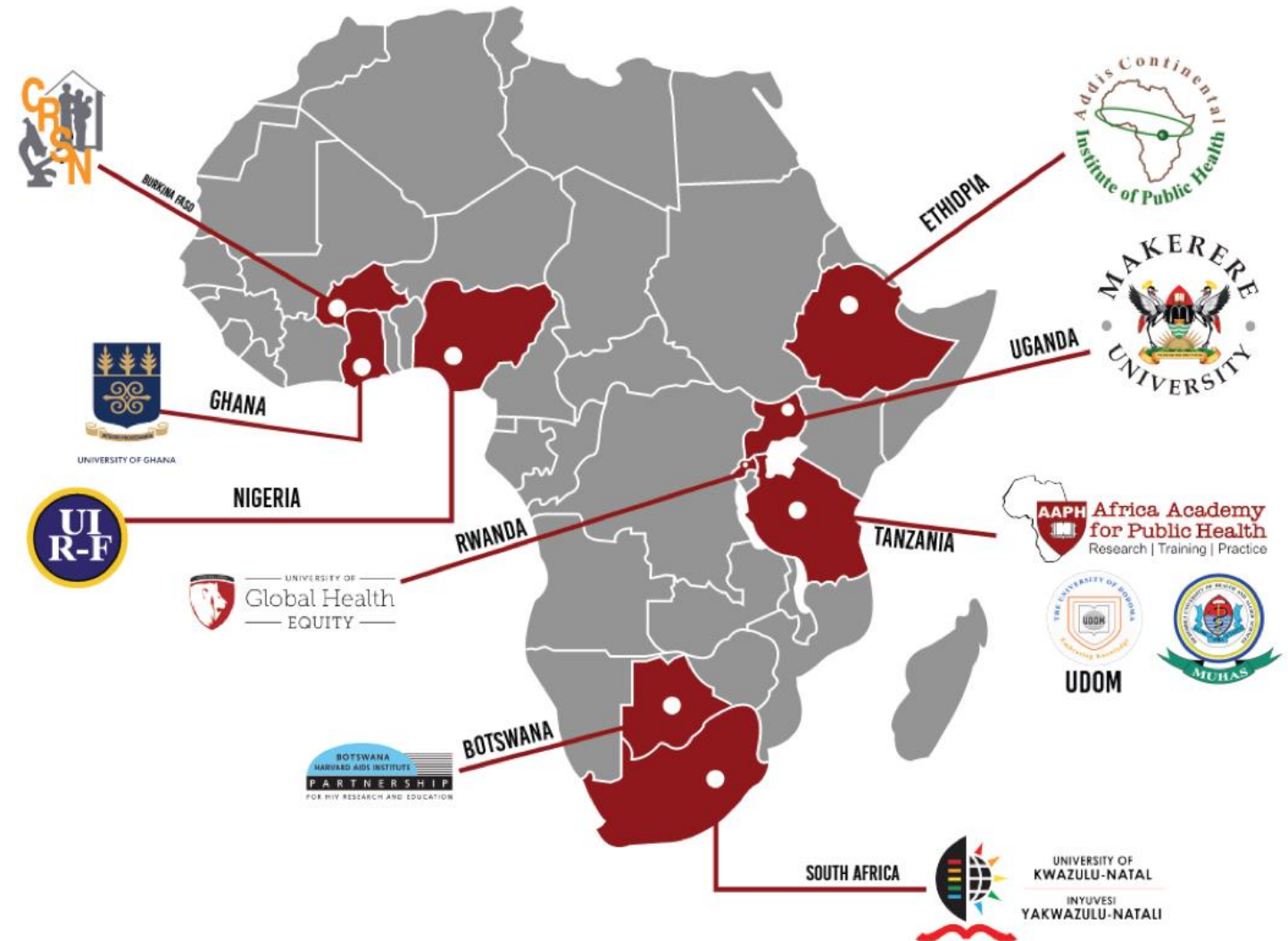
70% of sub-Saharan Africa (SSA) under the age of 30

SSA projected to have more adolescents than any other SDG Region by 2050

Limited data to inform policies and programs that address the unique developmental and health needs and outcomes of adolescents from SSA countries

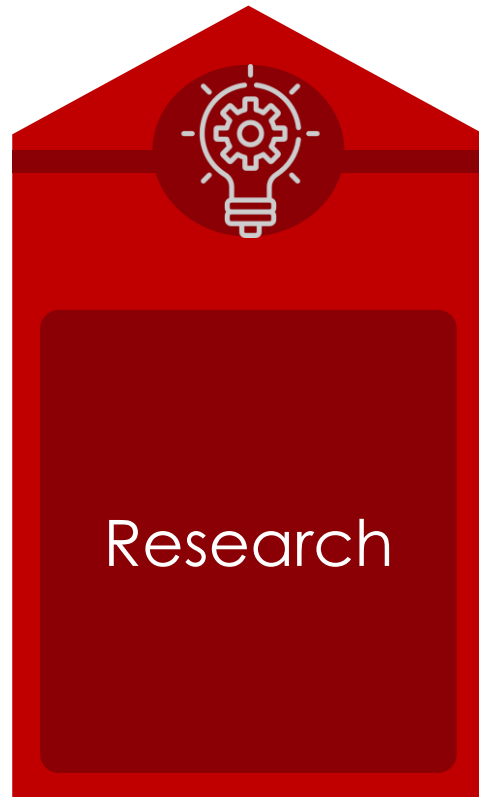
# Africa Research, Implementation Science and Education (ARISE) Network

- Launched in 2014 to advance collaborative education and research in African region
- Focus on Maternal, Child and Adolescent Health

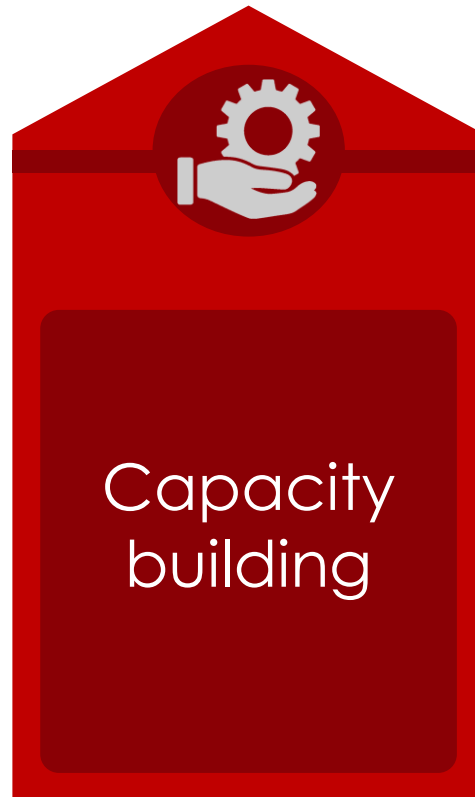


# Three pillars of ARISE Network

Robust training, strong leadership and greater health impact



Maternal, Child,  
Adolescent Health and  
Nutrition in SSA



Collaborative and  
multidisciplinary training to  
prepare public health  
professionals



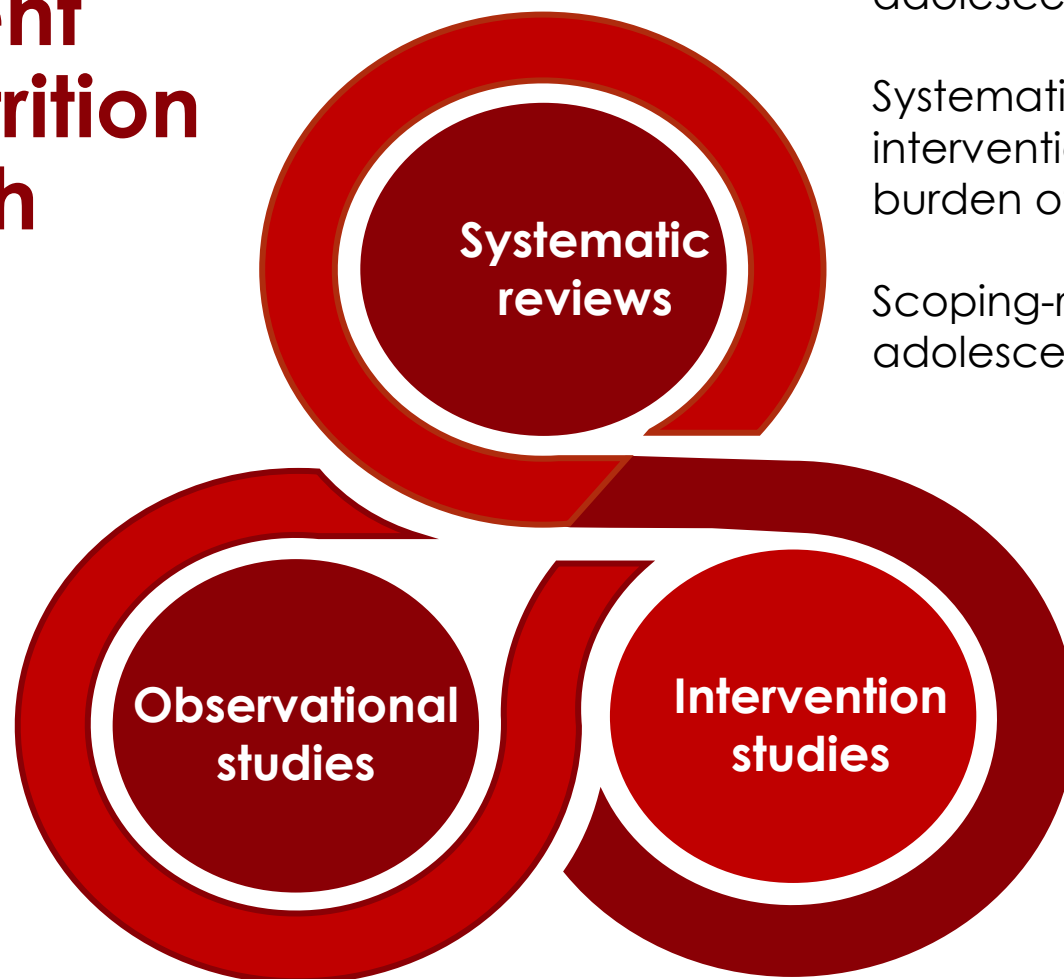
Connected and  
sustainable network of  
individuals and institutions

# ARISE Network's Adolescent Health & Nutrition Research

1. Community-based  
Adolescent Health Study  
2018-2020

2. School-based  
Adolescent Health and  
Nutrition Study 2020-2022

3. Adolescent Health and  
Well-being Longitudinal  
Study 2021-2024



Systematic review and meta-analysis of school feeding programs for children and adolescents in LMICs

Systematic review of school-based interventions addressing adolescent double burden of malnutrition in LMICs

Scoping-review of community-based adolescent nutrition interventions in LMICs

Meals, Education, and Gardens for in-school Adolescents (MEGA) study, Tanzania

Micronutrient supplementation trial for in-school adolescents, Tanzania & B. Faso

Designing and pilot-testing of a comprehensive school health and nutrition intervention, Tanzania

Multi-domain ARISE-NUTRINT & DASH projects for adolescents & young adults in SSA countries

# 1. Community-based Adolescent Health Study

- A cross-sectional community-based survey of 8,075 adolescents aged 10–19 in 9 communities in 7 countries
- Goal of generating community-based data on the state of adolescent health
- Communities selected using population cohorts maintained by health and demographic surveillance systems (HDSSs)
- 12 papers published as a Special Issue



Volume 25, Issue 1; January 2020

## Adolescent Health in sub-Saharan Africa

Edited by: Justine Bukenya, Chelsey Canavan, Till Bärnighausen, Wafaie Fawzi

## 2. School-based Adolescent Health and Nutrition Study

- Goals: (1) To understand risk factors and diseases, (2) To examine school food and nutrition environments and the food policy environment
- Five SSA countries – focusing on urban populations
- Methods
  - Included ~5000 adolescents aged 10-15 years
  - Quantitative survey of school food vendors
  - Situational analysis of school environments
  - Desk review of country-specific school health and nutrition policies and programs



**Upcoming Special Issue; 2024**

## **Improving nutrition, health and well-being of school-age children in the African context**

Features 12 articles with an editorial based on cross-country and country-specific analyses





# 3. Adolescent Health and Well-being Longitudinal Study

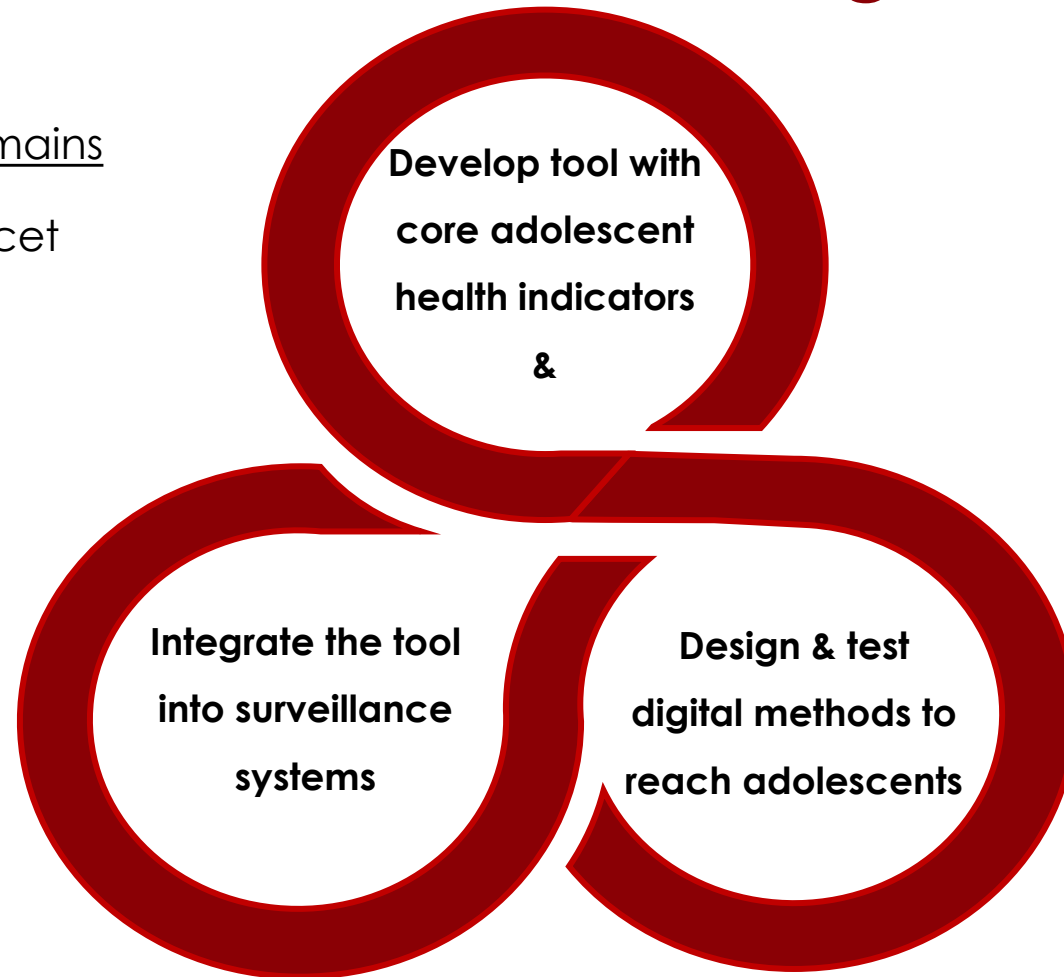
Systematic approach to identify indicators and measures in 6 Domains

Methods paper published in Lancet eClinicalmedicine (2023)

Two rounds of surveys in 10 sites in 9 countries

A cohort of 1200 adolescents at each site

7 cross-country analyses



Designed bulk-messaging strategy to reach adolescents

At least 60% reached with four rounds of messages on healthy eating habits and physical activity

# 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

# MEGA trial: Key lessons



Intervention packages resulted in:

- greater knowledge
- greater diet quality
- greater weight and BMI-for-age z-score

But neither partial nor full intervention was associated with adolescent hemoglobin concentrations

Promising results about the potential of integrated interventions

# SAMIA: Scaling-up high-impact micronutrient supplementation interventions to improve adolescents' nutrition and health in Tanzania and Burkina Faso

Weekly IFA  
supplement with  
education program

Daily MMS  
supplements with  
education program

Control arm  
(no intervention)

14 schools per  
country  
100 eligible adolescents  
per school (10-17 years old)

14 schools per  
country  
100 eligible adolescents  
per school (10-17 years old)

14 schools per  
country  
100 eligible adolescents  
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Teachers provide the supplements with physical  
monthly visits from nurses or community health  
workers

Outcomes: Hemoglobin;  
anthropometry,

Intervention implementation in two academic years with  
baseline and endline assessments in each year

## SAMIA trial: Key insights

- **In Burkina Faso:**

36.2% adolescents anemic at baseline (Millogo et al., forthcoming)

Higher prevalence of moderate to severe anemia in girls compared to boys

Post 12-week supplementation (Cliffer et al., 2023):

No statistically significant difference in risk of moderate/severe anemia in IFA arm schools vs control arm schools (adjusted RR=0.78; 95% CI: 0.34, 1.80)

No statistically significant difference in risk of moderate/severe anemia in MMS arm schools vs control arm schools (adjusted RR=0.35; 95% CI: 0.11, 1.06)

- **In Zanzibar:**

53.3% adolescents anemic at baseline (Yusufu et al., 2023)

Higher prevalence of moderate to severe anemia in girls (26.4%) compared to boys (17.0%)

Post 16-week supplementation (Forthcoming):

No statistically significant difference in risk of moderate/severe anemia in IFA arm schools vs control arm schools (adjusted RR=0.98; 95% CI: 0.68, 1.41)

Adolescents in MMS arm schools had 36% lower risk of moderate/severe anemia compared to those in control arm schools (adj RR=0.64; 95% CI: 0.41, 0.99)

# Design and evaluation of a whole school nutrition program in Tanzania

Address the double burden of malnutrition and food insecurity in young adolescents

- Four intervention design workshops with multiple stakeholders (Students, parents, teachers, government officials, food vendors and community members)
- Two public primary schools in Dar es Salaam
- 100 Form 1 (grade 8) students (aged 13-15 years), all the teachers, and school principals
- Mixed-methods evaluation

(Inspiration)  
Brainstorming ideas



(Ideation)  
Drafting crude prototypes



(Ideation)  
Finalizing intervention form

**Innovative co-design methods:** Free listing and priority setting, Case vignettes, Theory of Change exercise, Feedback loops



## Prototyping

### **Multi-component comprehensive intervention package**

Whole-school activities: School Health & Nutrition Committee, WASH policy, monthly wall magazines, School assembly activities and annual Nutrition Day.

Group-level activities: Nutrition education and physical activity for grade 8 students, workshops for teachers and parents

Individual-level: Digital messaging, counselling and referral services

Reducing nutrition-related noncommunicable diseases in adolescence and youth: interventions and policies to boost nutrition fluency and diet quality in Africa (ARISE-NUTRINT)

DASH: Research for design and evaluation of adolescent health interventions and policies in sub-Saharan Africa

**Surveillance:** Continuous and systematic data collection of health-related risks and conditions among adolescents (10-19 years and young adults (20-24 years) in seven SSA countries

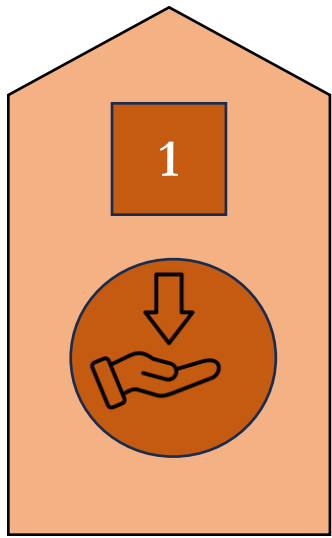
- Cohort of 8,400 participants in NUTRINT project (3 annual surveys)
- Cohort of 14,000 of participants in DASH project (4 annual surveys)
- Based on the ARISE adolescent health and well-being questionnaire

**Innovation design:** Developing interventions for three domains of health for adolescent and young adults using human-centered design approach

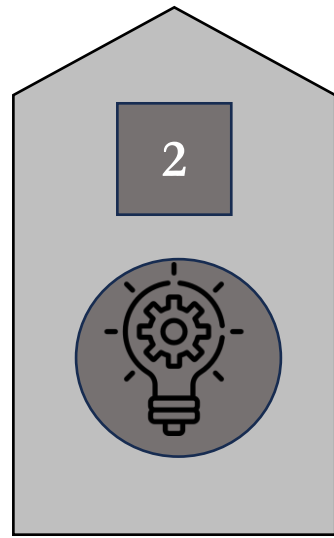
- Nutrition
- Mental health
- Sexual and reproductive health

**Evaluation of interventions:** Effectiveness, performance, and cost-effectiveness evaluation of interventions designed for three domains

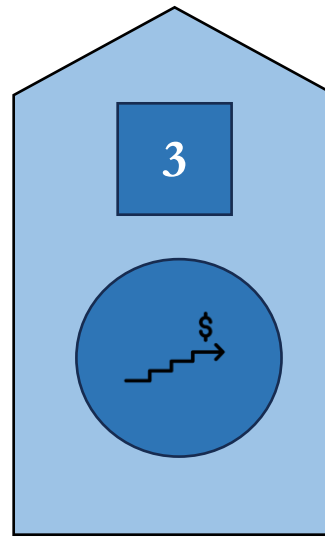
# Key considerations for adolescent health in sub-Saharan Africa



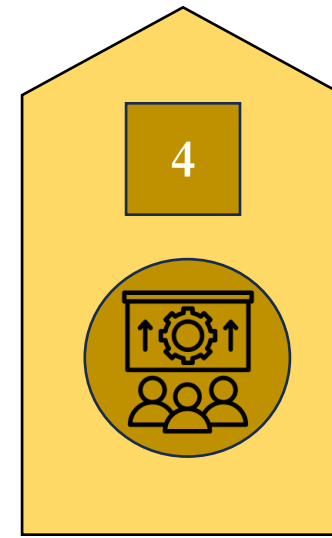
Urgent need for adolescent health interventions in sub-Saharan Africa



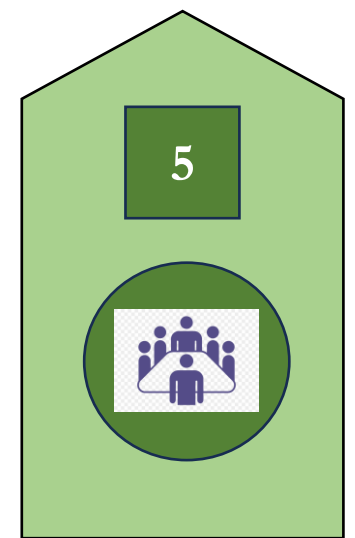
Innovative and adolescent-friendly interventions



Research in scaling up effective interventions



Capacity building and investment in adolescent health research



Community engagement in adolescent health



# Partnerships and support

- Addis Continental Institute of Public Health, Ethiopia
- Ahfad University for Women, Sudan
- Africa Academy for Public Health, Tanzania
- Africa Health Research Institute, South Africa
- ARISE-NUTRINT and DASH project collaborators
- Haramaya University, Ethiopia
- Harvard T H Chan School of Public Health, USA
- Heidelberg Institute of Global Health, Germany
- KEM Hospital Research Centre, India
- Makerere University School of Public Health, Uganda
- Ministry of Education, Burkina Faso
- Ministry of Health, Burkina Faso
- Ministry of Education, Tanzania
- Ministry of Health, Tanzania
- Muhimbili University of Health and Allied Sciences, Tanzania
- Nouna Health Research Center, Burkina Faso
- Technical University of Munich
- Tsinghua University, China
- University of Dodoma, Tanzania
- University College of London, UK
- University of Ghana, Ghana
- University of Ibadan Research Foundation, Nigeria
- University of Kwazulu-Natal, South Africa
- And other partners in Africa, Europe and US

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The logo for IZUMI FOUNDATION, featuring a stylized blue circular graphic above the text "IZUMI FOUNDATION".