



Shamba Maisha: Cluster Randomized Controlled Trial of a Multisectoral Agricultural Intervention to Improve HIV Health Outcomes in Kenya

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Craig R. Cohen MD¹, Ely Weke MS², Edward A. Frongillo PhD³, Lila A. Sheira MPH⁴, Rachel Burger MPH¹, Adrienne Rain Mocello PhD, Pauline Wekesa², Martin Fisher PhD⁵, Kate Scow PhD⁶, Harsha Thirumurthy PhD⁷, Shari L. Dworkin PhD⁸, Starley B. Shade PhD⁹, Lisa M. Butler PhD¹⁰, Elizabeth A. Bukusi PhD^{1,2}, Sheri D. Weiser MD⁴

¹Department of Obstetrics, Gynecology & Reproductive Sciences, University of California San Francisco, CA, USA; ²Centre for Microbiology Research, Kenya Medical Research Institute, Kenya; ³Arnold School of Public Health, University of South Carolina, SC, USA; ⁴Department of Medicine, University of California San Francisco, CA, USA ⁵KickStart International, San Francisco, CA, USA; ⁶Department of Land, Air and Water Resources, University of California Davis, Davis, CA, USA; ⁷Department of Medical Ethics and Health Policy, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA; ⁸School of Nursing and Health Studies, University of Washington Bothell, Bothell, WA, USA; ⁹Department of Epidemiology and Biostatistics, University of California San Francisco, San Francisco, CA, USA; ¹⁰Institute for Collaboration on Health, Intervention, and Policy, University of Connecticut, Storrs, CT, USA

BACKGROUND

Food insecurity and HIV viral suppression are linked through nutritional, mental health, and health behavior pathways. We examined the effects of a multisectoral agriculture and livelihood intervention on HIV viral suppression and nutritional, mental health, empowerment, and behavioral outcomes among HIV-positive adults in rural Kenya. The innovative intervention – *Shamba Maisha* (farming for life in Kiswahili) – targets the root causes of food insecurity and poverty in the region, which include inconsistent rainfall patterns and increasing prevalence of drought occurring in the setting of climate change

We performed a cluster RCT to test the hypothesis that the *Shamba Maisha* intervention would improve HIV viral suppression, reduce food insecurity, and improve nutrition, mental health and empowerment indicators among PLHIV.

METHODS

- Randomly allocated 8 pairs of health facilities in western Kenya to intervention or control arms.
- Eligibility criteria:
 - ≥18 years old and living with HIV and on ART >6 months
 - Moderately-to-severely food insecure
 - Have access to arable land and surface water.
- Participants were followed every 6 months for 24 months.
- Primary Outcomes: Absolute change from baseline to endline in HIV viral suppression (≤200 copies/mL), compared between arms using difference-in-differences analyses.
- Secondary outcomes: Clinic attendance, ART adherence, food insecurity, depression, self-confidence, and social support.

CLIMATE ADAPTIVE INTERVENTION COMPONENTS

- Human powered water pump for irrigation (see photo)
- Training in sustainable agricultural techniques
- Bank loan to purchase farming commodities
- Training in financial literacy & starting an agribusiness

RESULTS:

We enrolled 366 intervention and 354 control participants. Retention was 94.0% at the 24-month visit.

Table 1: Baseline characteristics of *Shamba Maisha* study population, by study arm (n=720)

	Control (n=354)	Intervention (n=366)
Female	194 (54.8%)	202 (55.2%)
Age, mean (SD)	40.4 (9.3)	40.3 (8.9)
Marital status		
Single	6 (1.7%)	12 (3.3%)
Married	251 (70.9%)	271 (74.0%)
Widowed	86 (24.3%)	75 (20.5%)
Household size, mean (SD)	6.1 (2.7)	6.5 (2.6)
Wealth index, quintiles		
Lowest	80 (22.8%)	62 (17.3%)
Second	59 (16.8%)	83 (23.1%)
Third	67 (19.1%)	76 (21.2%)
Fourth	71 (20.2%)	70 (19.5%)
Highest	74 (21.1%)	68 (18.9%)
Categorical food security (FI)		
Mild FI	2 (0.6%)	1 (0.3%)
Moderate FI	77 (21.8%)	72 (19.7%)
Severe FI	275 (77.7%)	293 (80.1%)
Viral load, detection limit ≤1000 copies/mL		
Undetectable	314 (89.0%)	333 (91.0%)
Viral load, detection limit ≤200 copies/mL		
Undetectable	291 (82.4%)	314 (85.8%)
Years on ART, median (IQR)	4.9 (2.6, 6.9)	5.1 (2.7, 7.2)

HIV viral suppression improved in both arms to ~95% but was not different by treatment arm. The intervention led to improved food insecurity, social support, self confidence and decreased depression compared to controls (Figure 1).

CONCLUSIONS

A multisectoral agricultural intervention reduced food insecurity and depressive symptoms and improved self-confidence and social support among PLHIV. Because viral suppression approached the UNAIDS goal of ≥95% in both study arms in the setting of widespread test and treat policies launched during the study period, it was not possible to detect additional effects of the intervention on HIV clinical indicators. *Shamba Maisha* is unique as a livelihood intervention for PLHIV in that we incorporated a drought-focused element (a human-powered irrigation pump) and training on sustainable farming techniques into its design. Though participants in our study were challenged by historic flood and drought conditions in western Kenya, the intervention led to demonstrable health and other benefits, suggesting that the *Shamba Maisha* intervention helps farmers to adapt to climate change. Interventions that improve livelihoods should focus on alleviating these constraining underpinnings while aiming to directly address multiple poor health conditions that may be syndemic.

For more information please contact:

Dr. Craig Cohen: craig.cohen@ucsf.edu
<https://shambamaisha.ucsf.edu/>

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