Food Insecurity and Poor Health in Sub-Saharan Africa

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The Fifth Annual Global Health Economics Colloquium: The Economics of Vulnerable Populations, at Home and Abroad
OVERVIEW

1. Food insecurity increases morbidity & mortality in HIV and other chronic diseases

2. Food security interventions reverse this cycle and improve health
HUNGER AND MALNUTRITION ON THE RISE IN SUB-SAHARAN AFRICA

• 31.0% severely food insecurity (from 28.0%)
• 22.7% undernourished (from 20.8%)
• Overweight and obesity continue to
• Causes related to adverse climactic conditions and rising conflict

FAO, Regional Overview of Food Insecurity and Malnutrition, 2017.
HIV AND FOOD INSECURITY: SYNDEMIC ISSUES

Food Insecurity
Kcal/per/day

Adult HIV Prevalence

FOOD INSECURITY & GENDER INEQUALITY: The role of gender

- 60% of undernourished worldwide are women/girls 
  \(^1\)
- Women prioritize food for children and families over self \(^2\)
- Female-headed households are more likely to be food insecure \(^3\)
- Women with lower sexual relationship power have higher food insecurity and malnutrition \(^4\)

\(^1\) United Nations Economic and Social Council [ECOSOC], 2007; \(^2\) McIntyre et al. CMAJ 2003; Stevens JSPN, 2010.
\(^3\) Gillespie S, HIV/AIDS and Food and Nutrition Security: From Evidence to Action. IFPRI, 2005; \(^4\) Siedner, AIDS and Behavior 2012
Transactional Sex:

Women are having sex because they are hungry. If you give them food, they would not need to have sex to eat.
FOOD INSECURITY, RISKY SEX & VIOLENCE: Qualitative Evidence

Transactional Sex:

Women are having sex because they are hungry. If you give them food, they would not need to have sex to eat.

Either my children and I starve tomorrow, or I have sex with someone today, and maybe get HIV, and will then die 5-10 years later. ¹

¹ Epidemic of Inequality, PHR Report, 2008
**FOOD INSECURITY & RISKY SEX:**
Similar results across diverse settings

<table>
<thead>
<tr>
<th></th>
<th>Botswana/Swaziland ¹</th>
<th>Brazil ²</th>
<th>San Francisco³</th>
<th>Vancouver⁴</th>
<th>Nepal⁵</th>
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<tbody>
<tr>
<td>Unprotected sex</td>
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<td>Sex exchange</td>
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<td>STI Symptoms</td>
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<td>Multiple partnerships</td>
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*Models adjusted for demographic, socioeconomic and clinical variables.

Food insecurity and poor health in Sub-Saharan Africa

- Poor nutrition
- Poor mental health
- Poor adherence to care

Worse chronic disease health

Increased acute care use and health costs

Increased poverty and unemployment

Vicious cycle of food insecurity and poor health

Weiser et al., Am J Clin Nutr, 2011
FOOD INSECURITY WORSENS HEALTH VIA POOR NUTRITION

- Undernutrition
- Micronutrient & macronutrient deficiencies
- Lower fruit & vegetable intake
- Obesity

Ford. Prev Chronic Disease, 2013
Food Insecurity Worsens HIV Health Via Poor Nutrition in SSA

Food insecurity → Stunting

FI HIV-infected children with 7X greater odds of stunting & 8X the odds of being underweight in Tanzania → Worse HIV/AIDS and chronic disease health

Sunguya et al, BMC Public Health, 2011
FOOD INSECURITY WORSENS HEALTH VIA
POOR MENTAL HEALTH

- Depression
- Anxiety
- Drug & alcohol use
- Stigma
- Poor overall mental health status

FOOD INSECURITY WORSENS HIV HEALTH VIA POOR MENTAL HEALTH IN SSA


p<0.001
FOOD INSECURITY WORSENS HEALTH VIA POOR HEALTH BEHAVIORS

Food insecurity —-> Poor health behaviors —-> Medication non-adherence, Treatment interruptions, Missed clinic visits —-> Worse chronic disease health

FOOD INSECURITY WORSENS HEALTH VIA POOR HEALTH BEHAVIORS
FOOD INSECURITY WORSENS HIV HEALTH VIA POOR HEALTH BEHAVIORS IN SSA

In Uganda, food insecure are less able to take HIV medications as prescribed

56% higher odds of ART non-adherence

Worse HIV/AIDS & chronic disease health

Weiser et al., AIDS, 2014
LACK OF FOOD/NUTRITION WORSENS HEALTH ALONG CASCADE OF CARE FOR HIV

FOOD=MEDICINE: ADDRESSING THE CYCLE OF FOOD INSECURITY & POOR HEALTH
POSSIBLE INTERVENTIONS

Targeted food supplementation

Livelihood/Vocational Training Programs

Food stamps/vouchers

Cash transfers

February 9th, 2018
Food Supplementation Programs Improve Health in SSA

Food support Programs

- Improvement in Weight and BMI (Kenya)¹
- Improved Depression in Kenya²
- 1.5 times higher ART adherence in Zambia³
- Recipients of economic intervention including food support less likely to die in Uganda⁴
- Decreased poverty and unemployment

SOCIAL PROTECTION APPROACHES: MOVING TOWARD LONG-TERM STRATEGIES

Food Insecurity and Poor Health In Sub-Saharan Africa

February 9th, 2018
ENGAGING MULTIPLE SECTORS
SOCIAL PROTECTION APPROACHES TO FOOD SECURITY

Interventions
- Direct Food Aid
- Food/Cash Transfer, or Incentives
- Livelihoods
- Assessing Impact

Sectors
- Health, NGOs
- Health, NGOs
- Health, NGO, Agriculture
- Microfinance
- Policy

Malnutrition
Food Insecurity
Agricultural systems, poverty, gender
SHAMBA MAISHA PILOT, KENYA
NIMH R34 (WEISER/COHEN/BUKUSI PIS)

Overview:
- “Farming for Life” in Kiswahili
- Targets poverty & agriculture for HIV-infected adults
- 2 clusters; n=140 people

Intervention components:
- Microfinance
- Kickstart Human-powered water pump
- Agricultural/finance training
SHAMBA MAISHA: INTERVENTION FRAMEWORK

Figure 2. Intervention Theory of Change

Cohen & Weiser, Springer Plus, 2015
Food Insecurity and Poor Health In Sub-Saharan Africa

February 9th, 2018

SHAMBA MAISHA: REDUCED HOUSEHOLD FOOD INSECURITY*

*Weiser & Cohen, AIDS, 2015
SHAMBA MAISHA:
INCREASED VIRAL SUPPRESSION

*Weiser & Cohen, AIDS, 2015
SHAMBA MAISHA: INCREASED SELF CONFIDENCE

**Diagram Description:**
- **Y-axis:** Self Confidence
- **X-axis:** Trial Time, Month
- **Legend:**
  - **Circles (Intervention):**
  - **Xs (Control):**
- **Statistical Significance:** p=0.004

**Text:**
- Food Insecurity and Poor Health In Sub-Saharan Africa
- February 9th, 2018
### Mechanisms: Shamba Maisha

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<tr>
<th>Nutritional</th>
<th>Mental Health</th>
<th>Behavioral</th>
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<td>“I think I have put on some weight since it started! Because I have been eating better ....In fact, the other day a woman was telling me nowadays my face looks healthy...And its only me who knows the secret to it - its because I am surrounded by vegetables!”</td>
<td>“It has given me hope and will to do my things. Not like before, when I used to be hopeless and scared. I also have the will to go about my duties and farm from which I get food and money thus living like any other person.”</td>
<td>“I find getting to clinic to be a little easier because now I am able to get money for my fare to the clinic... I get the money from the farm produce.”</td>
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<td>“Through the vegetables... now I am able to take my medication as required....When one is on ARVs you are required to eat and for now even if we have no other food we rely of these vegetables because they are always there.... “</td>
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QUALITATIVE RESULTS
REDUCED VIOLENCE

I used to be violent... The violence would mostly relate to money issues and this is the root cause in many homes... but right now she manages the farm. If I need some money... I can always ask her. So it has taken care of some form of domestic violence to some very big extent.

(Male, 41 years old)

Zakaras et al., Arch Sex Behavior, 2017
**Key Questions**

- What is the impact of a multisectoral agricultural and finance intervention on HIV clinic outcomes?
- What are the pathways through which the multisectoral intervention may improve HIV health outcomes?
- What is the cost-effectiveness of the intervention?
- What is the best way to scale up the intervention?

**Intervention**

a) Finance loan (~$175)
b) Agricultural implements: human-powered water pump, seeds, fertilizers & pesticides; &
c) Education in financial management and sustainable farming practices.

**Health Outcomes**

- VL, CD4 counts

**Pathways:**
- Nutrition
- Health Behavior
- Mental Health
- Empowerment

**Standard of Care**

8 communities 44 participants each

8 communities 44 participants each

**Shamba Maisha**

16 Communities 3 counties in Kenya

Kenya

Migori

Homa Bay

Kisumu

8 communities 44 participants each
Climate Change: Mechanisms for Reduced Food Availability

- More droughts & large crop loss
- Temperatures reduce crop yields by photosynthesis;
- Heavy rains and storms flood fields, erode soils and wash away crops
- Higher ozone damages crops
- Thriving plant pests and diseases with CO2 levels and temperatures
- Animal deaths; migration of fish

PSR Climate Change and Famine Fact Sheet; Wheeler, Science 2013; Schmidhuber, PNAS, 2007
CLIMATE CHANGE AND FOOD INSECURITY: OVERLAPPING VULNERABILITY

Food Insecurity
Kcal/per/day

Climate Change Vulnerability

Mapping the Impacts of Climate Change
TAKE HOME POINTS

- FI and poor health interact in a vicious cycle
- FI negatively impacts health via nutritional, mental health, and behavioral pathways
- Improving FI can address multiple health problems simultaneously
- Consider environmentally sustainable approaches
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