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Livelihood Interventions: One Intervention, Many Effects

Closing the Gap between Rigor and Relevance:

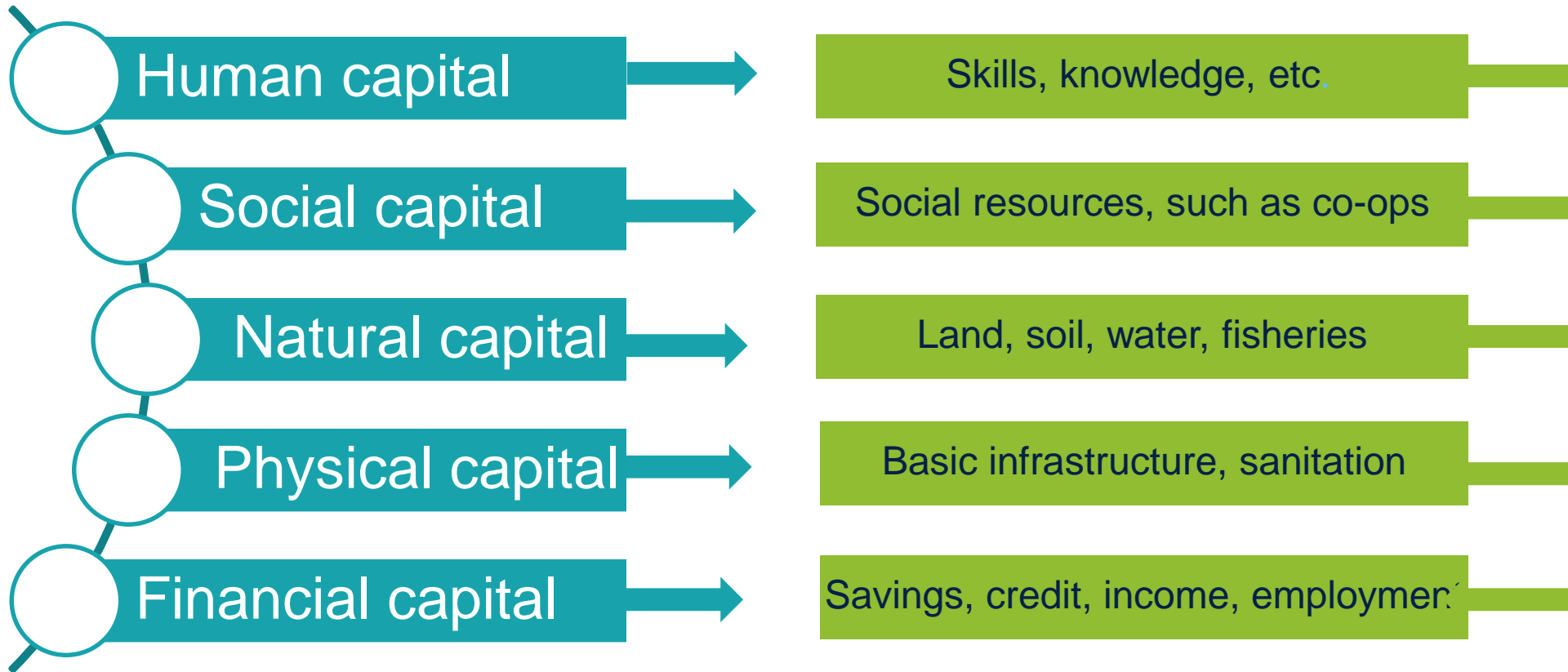
Methodological Opportunities for Implementation Science to
Address the HIV Epidemic

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September 28th, 2018

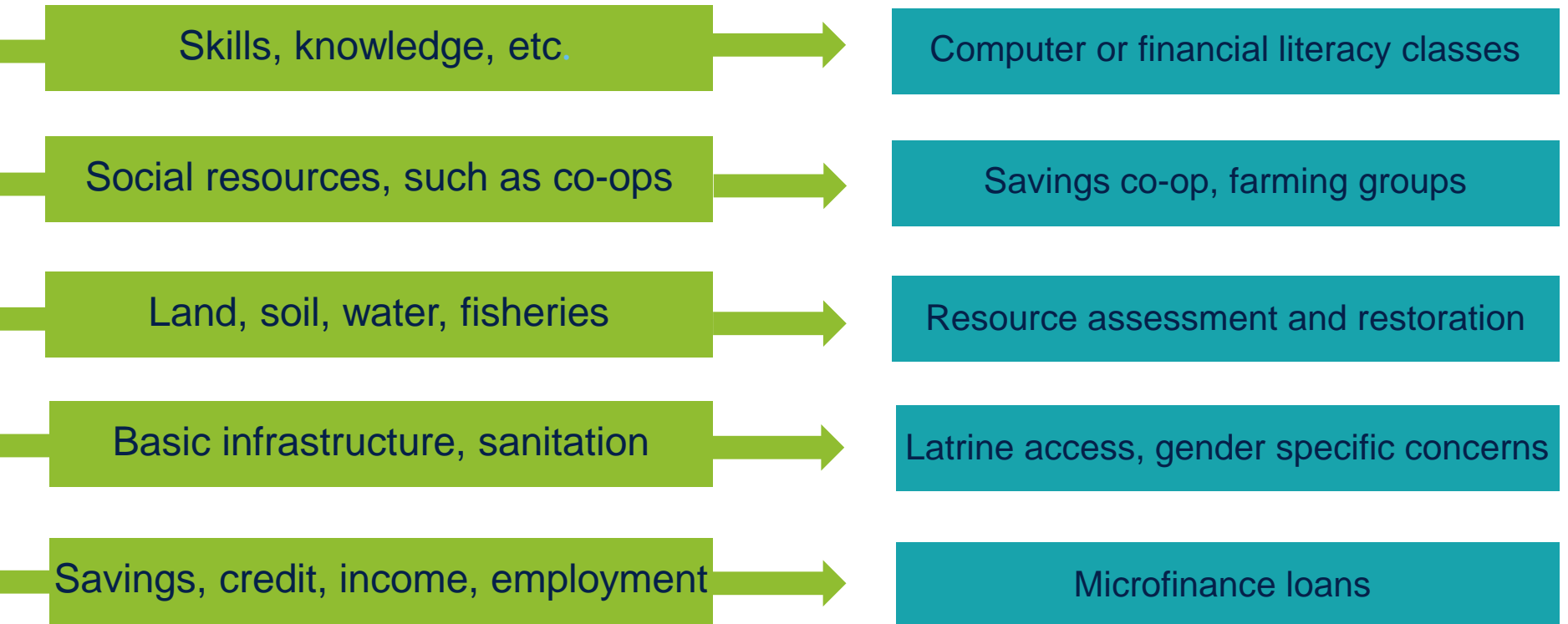


Sustainable Livelihood Framework



Source: International Recovery Platform/ UNDP

Examples of livelihood interventions



Source: International Recovery Platform/ UNDP

Threats to livelihood assets

Skills, knowledge, etc.

Social resources, such as co-ops

Land, soil, water, fisheries

Basic infrastructure, sanitation

Savings, credit, income, employment

Political instability, economic competing demands

War; Competing demands;

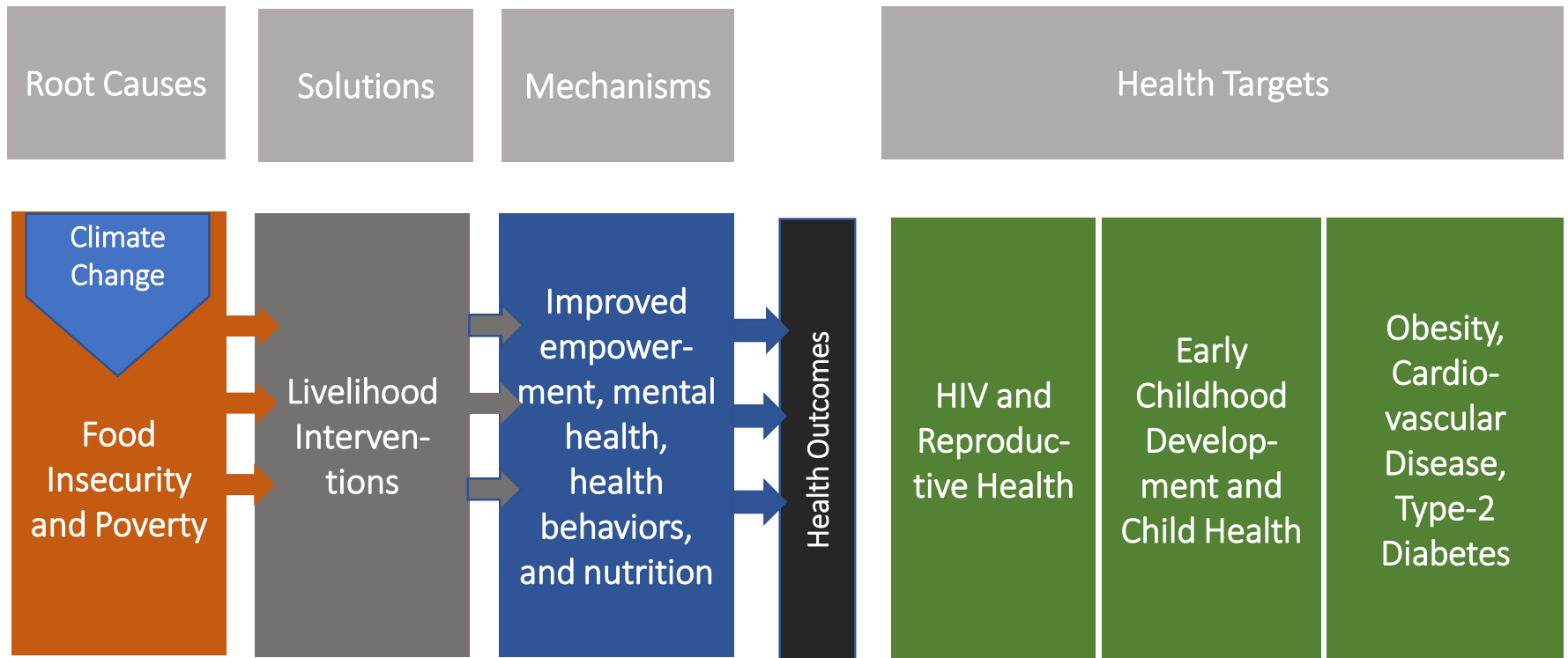
Seasonal changes, climate change, natural resource conservation

Political instability, natural disasters

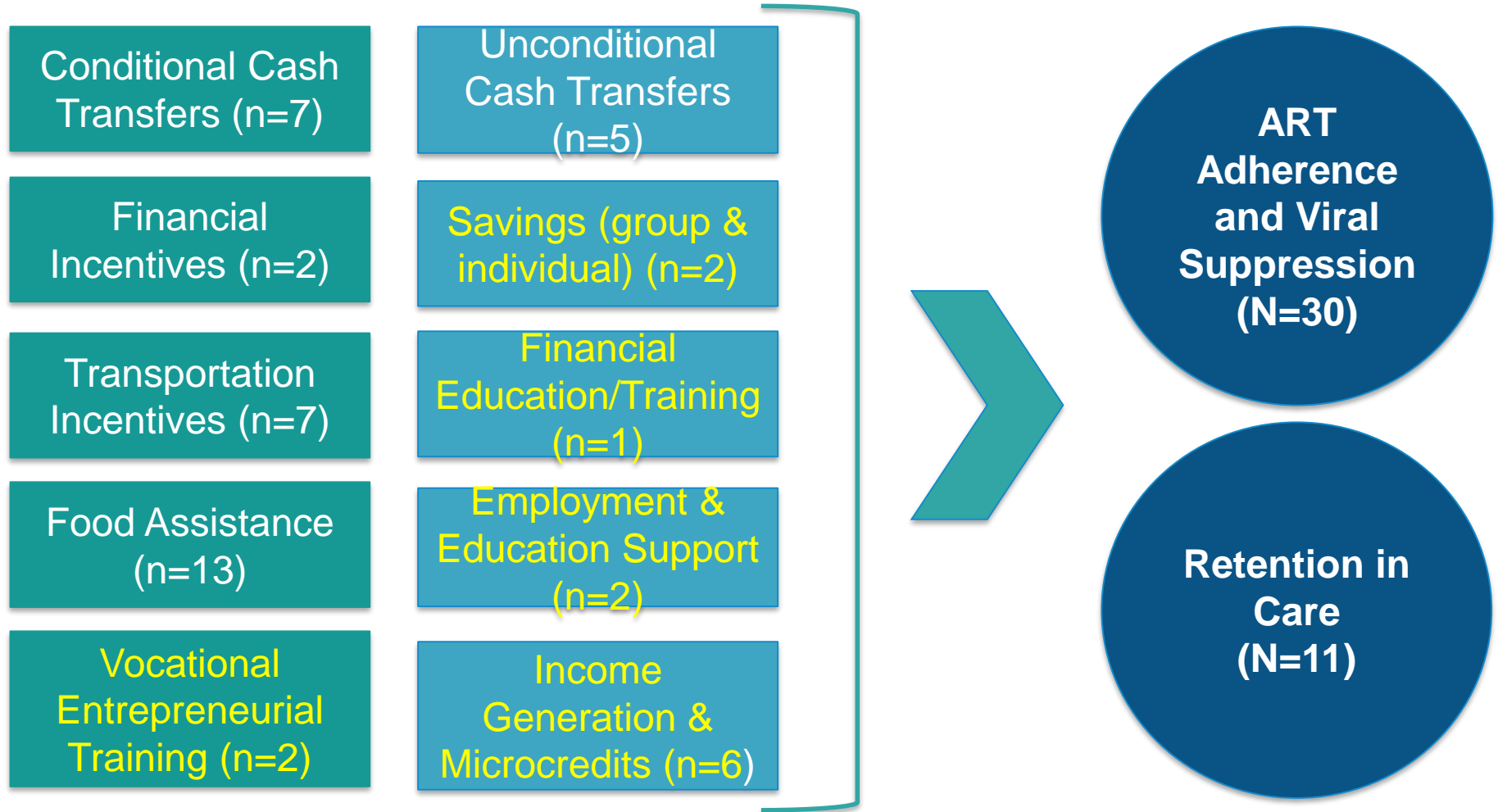
Economic instability, currency devaluation

Source: International Recovery Platform/ UNDP

Livelihoods Framework for Influencing Health



Household Economic Strengthening Interventions to address HIV outcomes:



Swann, ASPIRES Report & AIDS Care, 2018

Review of the Evidence: Income Generation (+ Financial Education/Training)

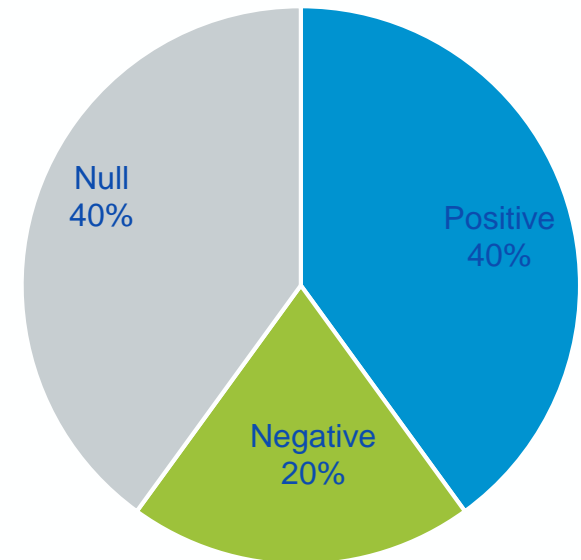
Adherence & Viral Suppression

- Five studies included in review
- All were of medium quality
- Most combined effects

Retention in Care

- 1 study in review
- Medium quality
- Null effects

Adherence/Viral Suppression Direction of effect:



Shamba Maisha: “Farming for Life” in Kiswahili

Co-Principal Investigators



Craig Cohen, MD, MPH
Professor, UCSF



Elizabeth Bukusi, MBChB,
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Shamba Maisha Pilot Study

NIMH R34 in Western Kenya



Overview:

- “Targets poverty & agriculture for HIV-infected adults
- Potential to impact financial, human, natural and social capital
- 2 clusters; n=140 people

Intervention components:

- Microfinance
- Kickstart Human-powered water pump
- Agricultural/finance training

Shamba Maisha Intervention Framework

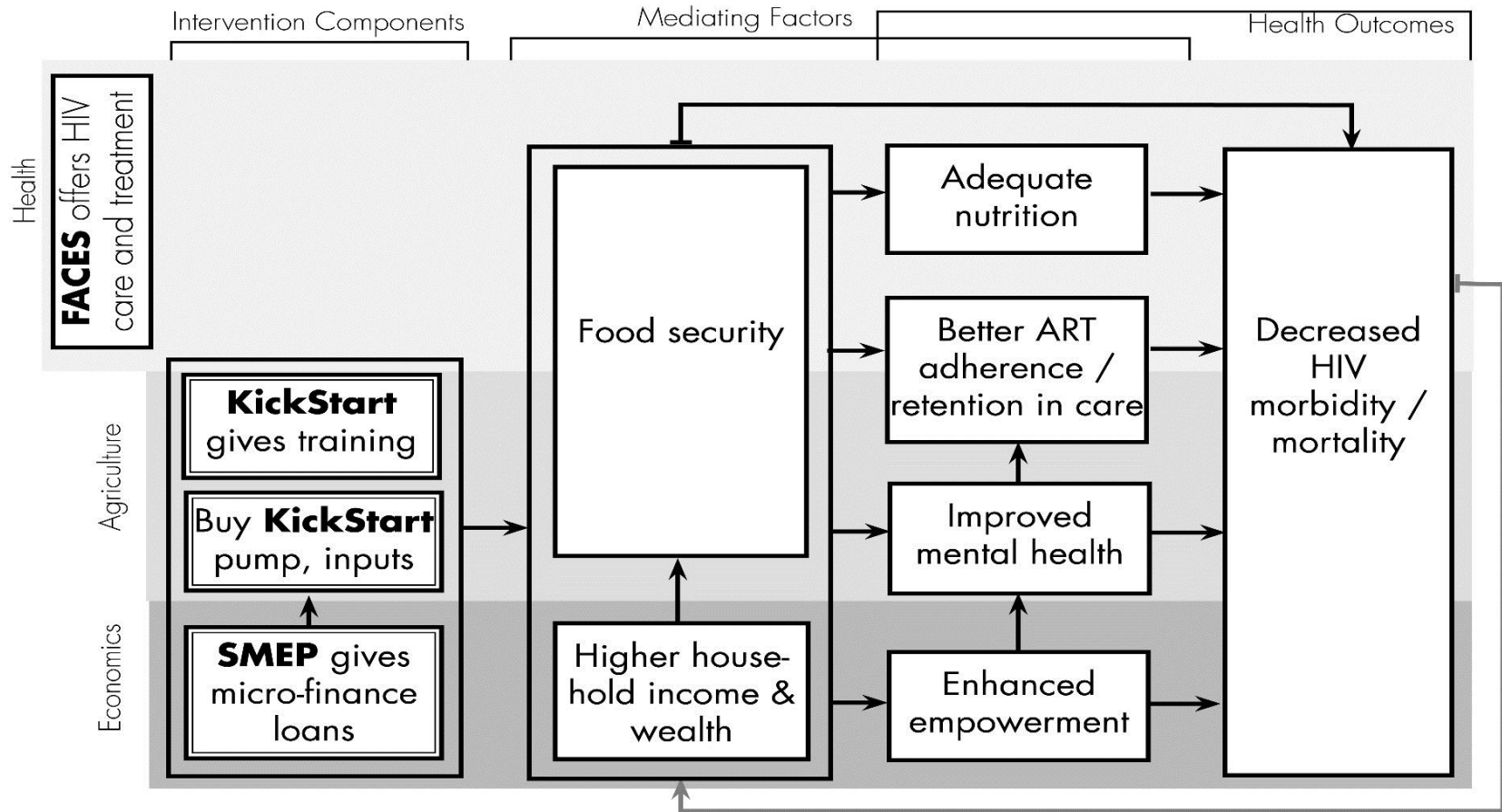
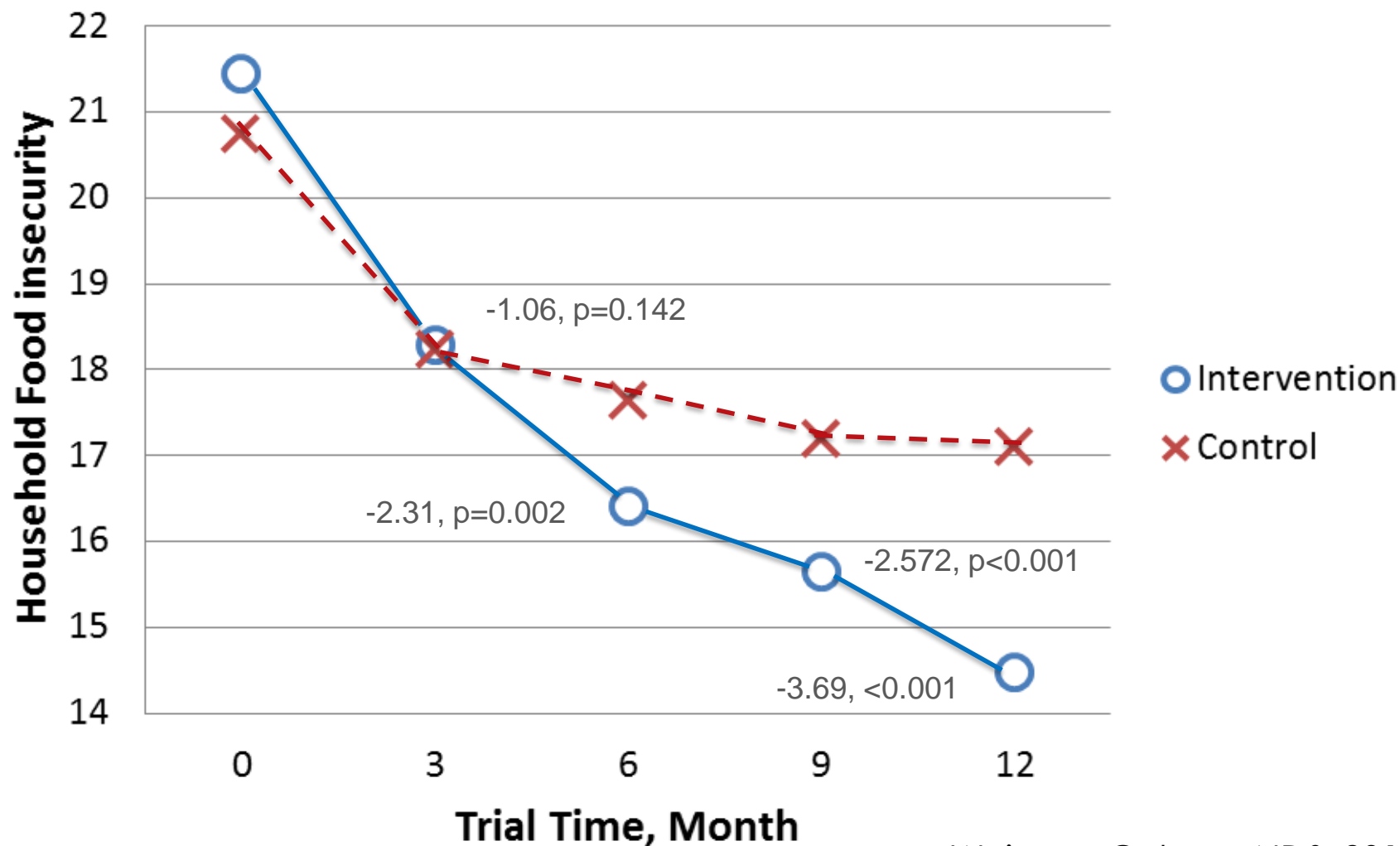


Figure 2. Intervention Theory of Change

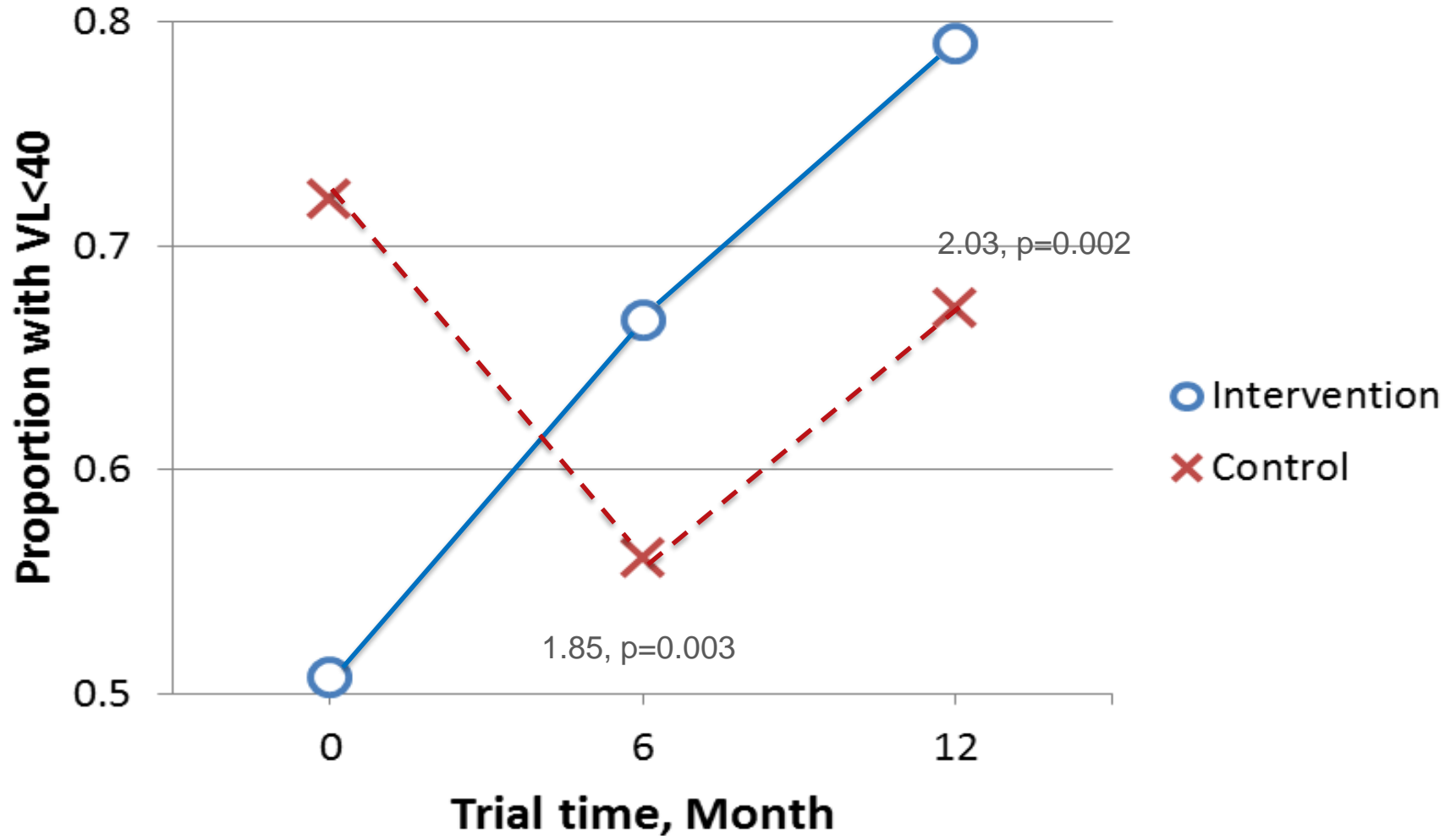
Cohen & Weiser, *Spinger Plus*, 2015

Shamba Maisha Pilot Results: Decreased food insecurity



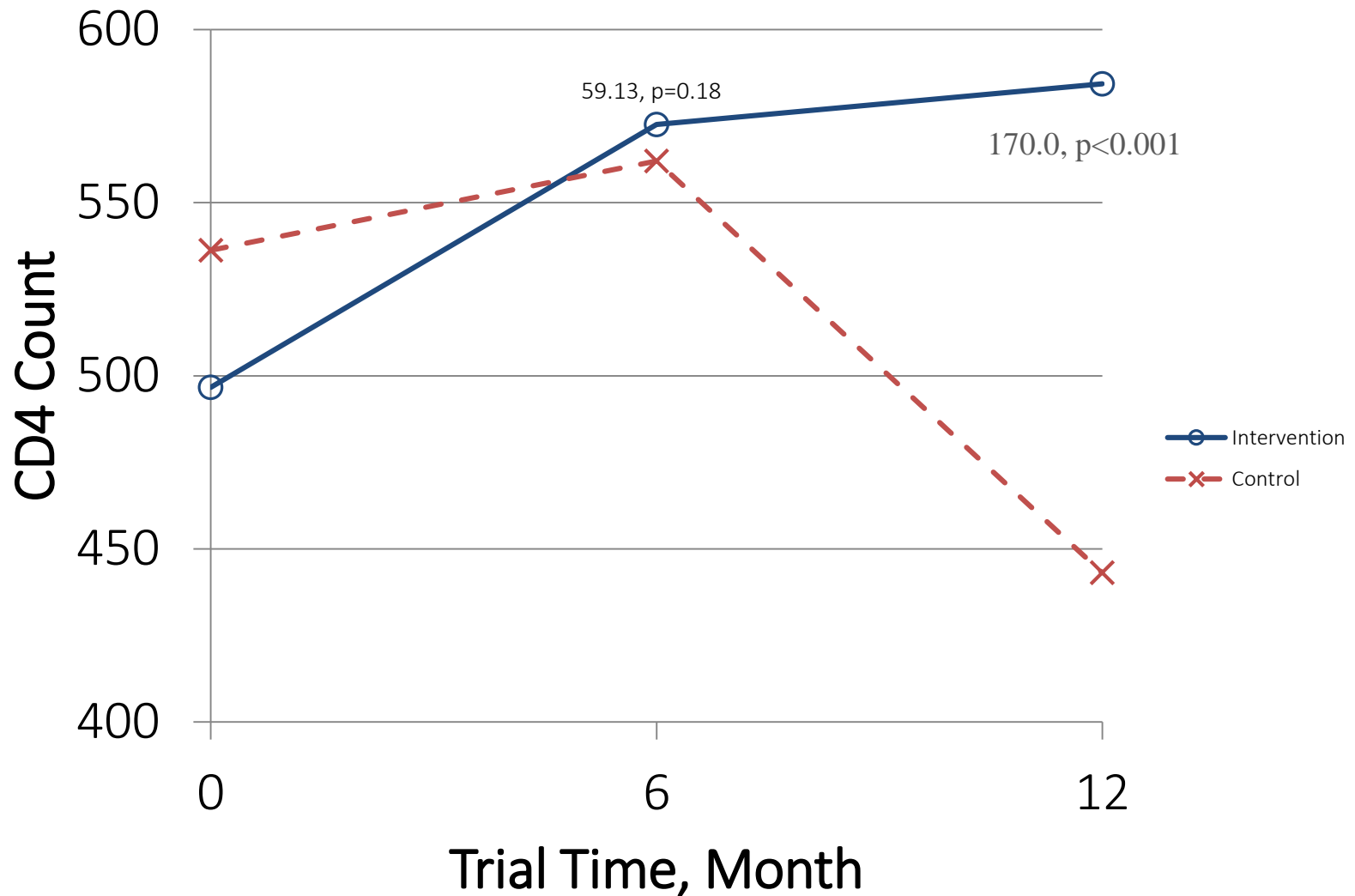
Weiser & Cohen, *AIDS*, 2015

Shamba Maisha Pilot Results: Increased viral suppression

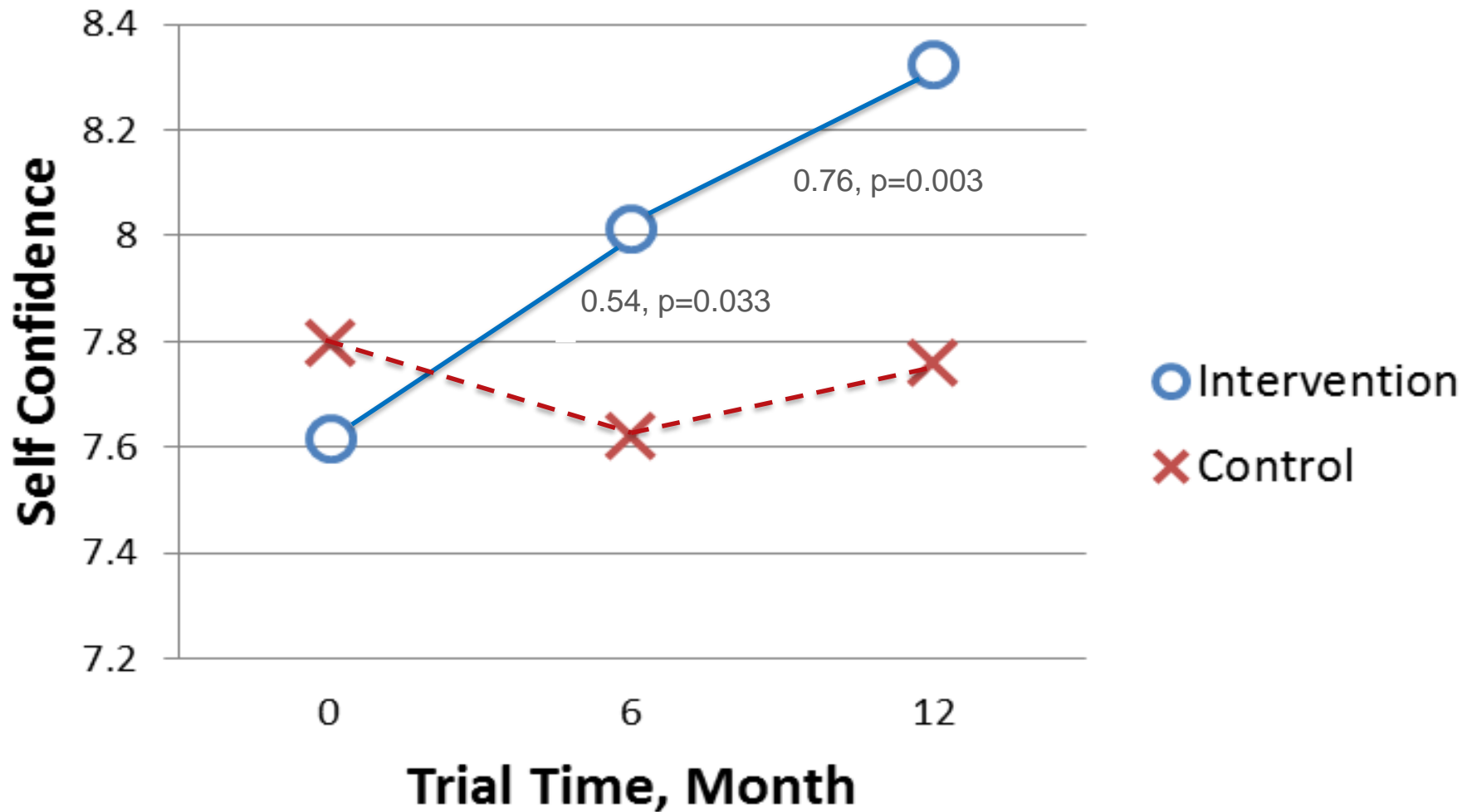


*Weiser & Cohen, *AIDS*, 2015

Shamba Maisha Pilot Results: Increased CD4 cell count



Shamba Maisha Pilot Results: Increased self confidence



Mechanisms by which Shamba Maisha works

Nutritional	Mental Health	Behavioral
<p><i>“I think I have put on some weight since it started! Because I have been eating betterIn fact, the other day a woman was telling me nowadays my face looks healthy and so on (laughs). And its only me who knows the secret to it - its because I am surrounded by vegetables!”</i></p>	<p><i>“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.”</i></p>	<p><i>“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.”</i></p> <p><i>“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.... “</i></p>

Qualitative Results

Empowerment: Increased autonomy

*Since I joined SM, we all have an equal say when it comes to our property.... **Everyone has an equal share in the resources. My two wives and I all have to give their opinion before we see which opinion to adopt.** The chair to our meetings is not necessarily me, it can be any of the three of us.*

Male, 42 years old

***Currently I do not ask for anything from my husband, in fact he is the one who asks me for money...** So I am doing very well at home because I am able to buy clothes for my kids as well as pay for their school fees. .. So generally things have improved.*

Female, 28 years old

Qualitative results: Reduced domestic 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 and takes it as hers... Now she has some few coins in the pockets and 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

Qualitative results: Changes in stigma

Currently, people are even surprised **that those they thought were worthless can do very well..** They have always perceived us to have a very short life span, but now they see our health changing for the better and we are doing our work just normally. That is really challenging them because now they know that these people they view to be worthless can work successfully.

30 year old female participant

Since I joined *Shamba Maisha*, I have **experienced a big change and now I have a name!** Nowadays when I hear anyone who wants to purchase vegetables I just urge them to come to my home and they will get them... **They now view us as people.** And in case of any problem and the village committees asks for contributions, I make mine immediately. **This makes them realize that I am powerful and that I am also a human being.**

36 year old male participant

Tsai, Cohen and Weiser, *AIDS and Behavior*, 2015

Pediatric Shamba Maisha Pilot Study

NIMH R21 in Western Kenya; PI: Lisa Butler



Goals:

- To evaluate impact of SM on somatic growth and cognitive and social-emotional development among 200 children, enrolled at age 0-60 months.



Primary outcomes for pilot:

- Somatic growth (weight-for-age, height-for-age, and weight-for-height z-scores),
- Diet and nutritional diversity

Pediatric Shamba Maisha Pilot Study

NIMH R21 in Western Kenya; **PI Lisa Butler**



Results:

- Compared to children in control households, children in intervention households had greater increase in:
 - Weight (0.4 kg)
 - Consumption of staples, legumes, fruits and vegetables (other than those rich in Vitamin A), meat, and fat

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?



Shamba Maisha Partners
Kenya MOH
FACES
KEMRI
KickStart
Equity Bank

Intervention

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

Standard of Care



8 communities
44 participants each



8 communities
44 participants each

Outcomes

Health Outcomes

- Viral Suppression
- CD4 Count
- Physical Health Status
- WHO stage
- Hospitalizations

Food Security & Household Income

through these pathways:

- Nutritional
- Behavioral
- Mental Health
- Empowerment

Pediatric Shamba Maisha (MH109506) (Butler, Otieno)

Key Questions

- What is the impact of SM on nutritional, health and neurobehavioral outcomes among HIV affected children?
- What are the pathways through which SM may improve these outcomes?
- What is the incremental cost and cost-effectiveness of the intervention with respect to children's health outcomes?



Shamba Maisha Partners
Kenya MOH
FACES
KEMRI
KickStart
Equity Bank

Intervention

- a) Finance loan (~\$175)
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Standard of Care



8 communities
44 children-caregiver dyads

Outcomes

Pediatric Outcomes

- Somatic Growth
- Morbidity
- Hospitalizations



8 communities
44 children-caregiver dyads

Food Security & Household Income

through these pathways:

- Child Diet
- Caregiver Physical and mental Health
- Caregiver empowerment
- Home Environment

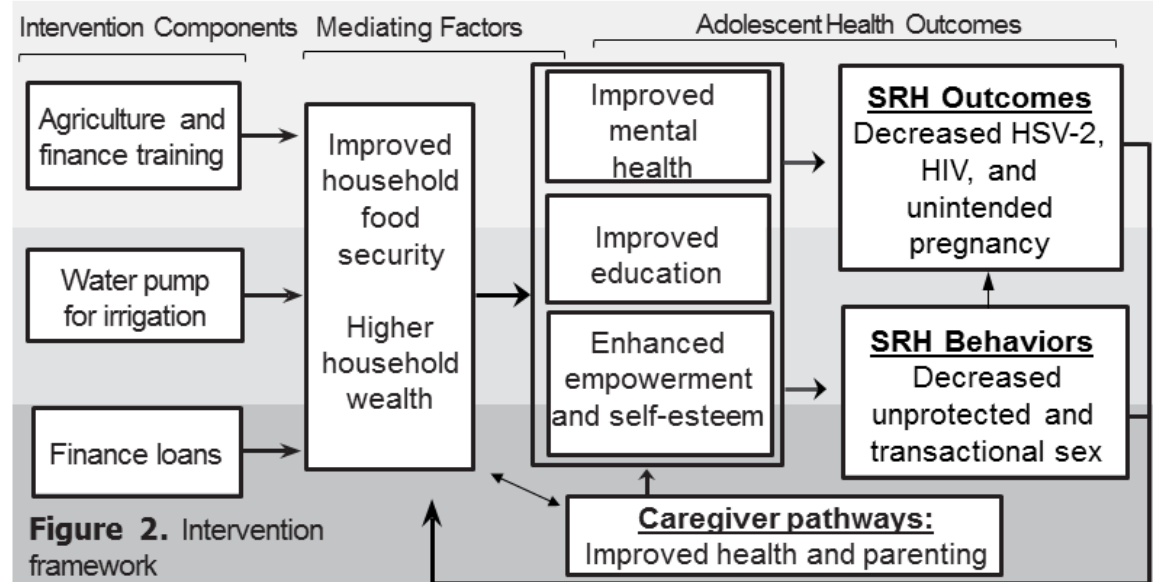
Adolescent Shamba Maisha (HD095739) (Weiser, Onono)

New R21 seeks to understand adolescent health:

- Evaluate the impact of the intervention on the sexual and reproductive health of HIV-affected adolescent females living in the households of Shamba Maisha participants

- Hypotheses:

- Adolescents living in SM households will experience a lower prevalence of STIS (HSV-2 and HIV) and fewer sexual risk taking behaviors
- SM will improve household FI and wealth, which will contribute to improved SRH outcomes mental health (less depression, anxiety), educational (increased education), and empowerment (improved self-esteem, self-concept) pathways.



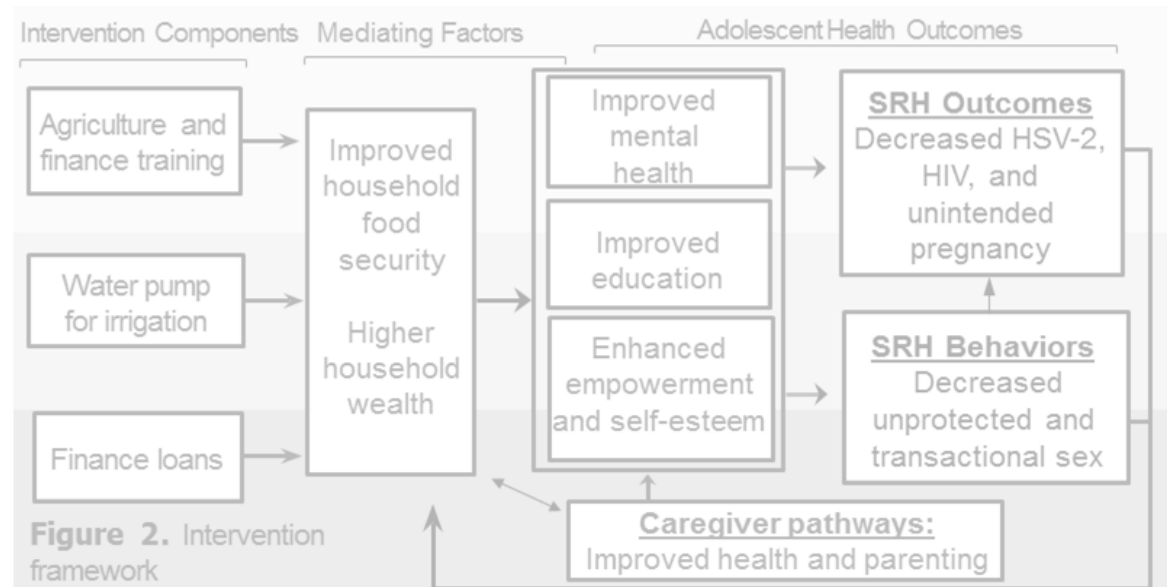
Adolescent Shamba Maisha (R21HD095739-01)

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The final goal is to translate lessons learned from SM into the design of an enhanced intervention that is most responsive to the needs of HIV-affected adolescent girls and maximizes the intervention's impact on SRH outcomes.

Other Potential Outcomes

- Pregnancy and Reproductive Health
 - Doris Duke Fellow has year long grant to assess using mixed methods
- Chronic Disease and other Infectious Disease Outcomes
 - Not Able to Assess
- Gut/soil microbiome
 - GI fellow interested in creating a project



Lessons learned in Implementation

- Need for transdisciplinary collaboration
 - Shamba Maisha brings together a team of clinicians, epidemiologists, agriculturalists, bankers, economists, and social scientists
 - Changes in one aspect of the intervention may affect others: consistent involvement of all is imperative
- Use mixed methods to understand the mechanisms by which interventions work and challenges encountered
- Involve key local stakeholders at all stages to promote sustainability and stimulate local interest and investment

Challenges: Be Prepared for the Unexpected....

- Changes in banking regulations which affected financial aspect of intervention
- Historically atypical floods which devastated farms
- Historically atypical drought which dried up permanent water sources
- Election violence affecting clinic adherence and data collection
- Nurses strike
- **HIPPOS!!**



Addressing challenges

- Changes in banking regulations:
 - Solution: Needed to involve UCSF legal team for contract with banks
- Historically atypical floods/drought
 - Solution: Insurance package on loans; distribute seeds to participants to mitigate; tailor training
- Election violence
 - Solution: pause data collection until violence passed
- HIPPOS!
 - Solution: Kenyan Wildlife Society training on how to make trenches to prevent hippos from accessing crops

Climate Change: Impacts on Livelihoods¹

- More droughts & large crop loss
- ↑temperatures reduce crop yields by ↓photosynthesis;
- Heavy rains flood fields, erode soils and wash away crops/ kill animals
- Melting glaciers and changing rivers reduce water available for irrigation and home use
- Higher ozone damages crops
- Thriving plant pests and diseases
- Animal deaths; migration of fish



Climate Change (PI Nicastro): Livelihood & Nutrition Impacts

"Recent rains and floods damaged all farm crops leading to scarcity at home and increased prices at the market. The roads are flooded so I can't take anything to market to sell so my income is affected. Last year, the rains destroyed all of our crops which is the only way we get income, so we couldn't buy any food or anything else." (Female, 32 years old)

"Weather changes affects yield on my farm. Too much rain or drought interfere with the growth of plants and lowers the quality of yields....This interferes with our children's growth since they are forced to eat food that are difficult to chew (mixture of maize and beans) just like the adults." (Female 54 years old)

Climate Change (PI Nicastro): Other Health Impacts

"I undergo stress when wilt wiped out my maiden Black Night Shade garden. I was traumatized and felt like abandoning agriculture altogether. I did not seek mental health care, instead I talked with my Shamba Maisha agricultural trainer about it. The wilt is from the heavy rains and waterlogged soil. The land doesn't have time anymore to dry." (Male participant, 39 years old)

"Even though we rarely face chronic diseases, Malaria and flu were common during this recent rainy season. Malaria is more common now due to stagnant pools of water that breed mosquitoes during rains." (Female participant, 39 years old)

Take home points:

- Livelihood interventions can impact multiple health problems simultaneously for entire household
- Requires transdisciplinary partnerships
- Needs horizontal rather than vertical approach & funding mechanisms
- Consider environmentally sustainable approaches



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