Are sweet potatoes really sweet?

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22 January 2016

Background

- In Zambia, half of children under 5 years are considered to be Vitamin A deficient (NFNC / University of Zambia / MOST/CDC, 2004) sited in Samale et al. 2015
- Vitamin A is key for good vision, a healthy immune system and cell growth;
- Potential Intervention: Introduction of biofortificated orange flesh sweet potatoes into the diet can increase a high nutritional value in vitamin A (Low et al, 2007, A food-based approach introducing Orange-Flesh sweet potatoes increased Vitamin A Intake and Serum Retinol Concentration in Young Children in Rural Mozambique, Journal of Nutrition, Vol 137);
- Target population: Farming households in villages.

Theory of Change

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Needs	Input	Output	Short term Outcome	Long term Outcome
Low consumption of Vitamin A rich foods among children under 5 years old.	Offering free cuttings of biofortified sweet potato to rural farmers and training on GAPS's (good agricultural practice and economic benefits); Awareness training of the nutritional benefits of sweet potatoes and GCP's (good cooking practices);	Sweet potatoes cultivated, harvested, and consumed; Surplus are sold GAP trainings are held; Community cooking sessions are held;	Increase consumption of Vitamin A. Increase income of small farmers.	Improved sustained vitamin A levels in farming communities. Change in crop composition




		Assumptions	Indicators
Long-term Outcome	Improved sustained vitamin A levels in farming communities. Change in crop composition		Measure of Vitamin A in the long-term. Area cultivated under sweet potato.
Intermediary Outcome	Increased consumption of Vitamin A. Increase income of small farmers.	The crop will succeed and there is surplus yields to sell.	Measure of vitamin A. Measure of marketable sales and farm income.
Output	Sweet potatoes cultivated, harvested and consumed; GAP trainings are held; Community cooking sessions are held;	Sufficient and sustained consumption of sweet potatoes. Sweet potatoes are more profitable than replaced crop.	No of vines planted No of participates at the training. Frequency of sweet potato consumption in farming households.
Input/ Intervention	Offering free cuttings of biofortified sweet potato to rural farmers and training on GAPS's (good agricultural practice and economic benefits); Awareness training of the nutritional benefits of sweet potatoes and GCP's (good cooking practices);	• Farmers are willing to cultivate novel and biofortied crops. • Households are willing to change their dietary habits. • Assuming the information is delivered appropriately to ensure farmer buy-in at all levels.	Share of villages visited and participated in the program. No of trainings offered.
Needs Assessment	Low consumption of Vitamin A rich foods among low-income farmers.		

Evaluation Questions and Outcomes

- Does the training and providing of cuttings of sweet potatoes to lead to an increase in:
  a. Vitamin A intake in children under 5 in farming households; and
  b. Net farm income?
- Does nutritional information sessions add value to the main intervention?

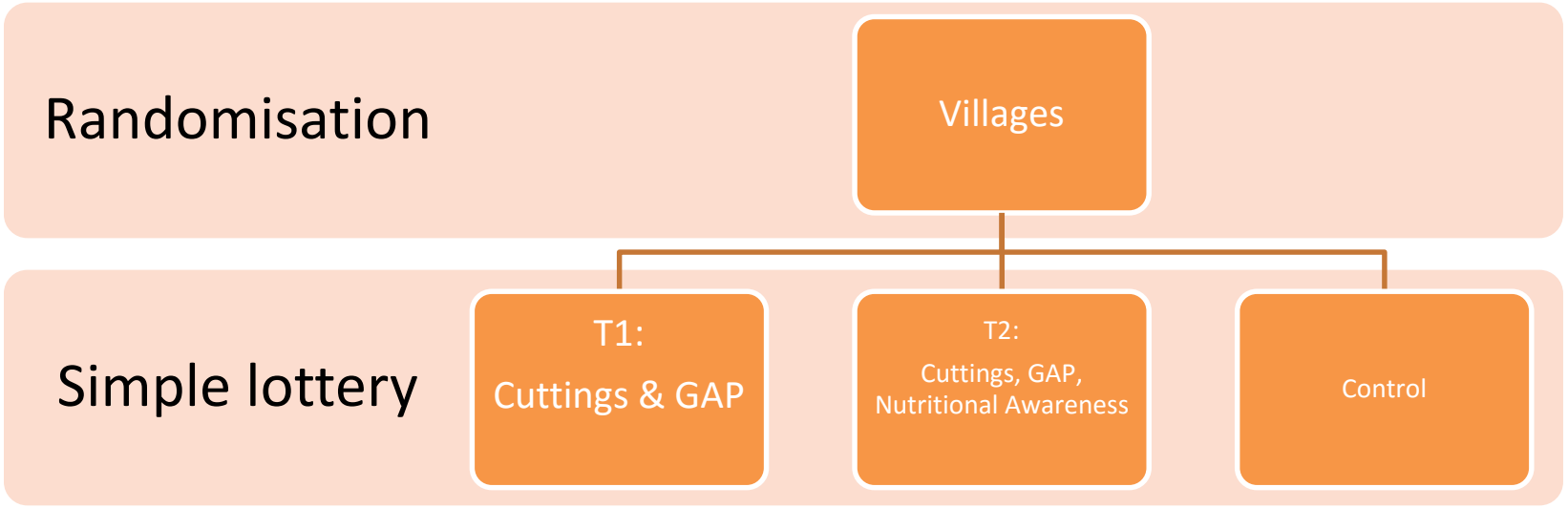
Evaluation Design

- Unit of randomization:
  - Level: Villages in Zambia
  - Intervention level: Farming Households
  - (with child under 5, and smallholders)

- Actual randomization design:
  - Villages T1: Cuttings and training
  - Villages T2: Cuttings, training, awareness
  - Villages C: Control

- Randomization strategy:
  - Simply lottery

Evaluation Design



Data and Sample Size

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- Outcomes
  - Increase consumption of Vitamin A.
  - Increase in income of small farmers.

- Data Source
  - Survey
  - Dietary Diversity Score

Data and Sample Size

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Power Calculation

- From literature expectable impact of T1 on DDS in similar studies: 0.52 on a range from 1 – 9 (14%)
- Small expected treatment effect: T1 & T2 (10% additional treatment effect)
- Expected treatment effect of T1 + T2 = 0.57 (+10%)

Data and Sample Size

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- Effect size for treatment 1

$$d = \frac{4.13 - 3.56}{1.72}$$

$$= 0.33$$

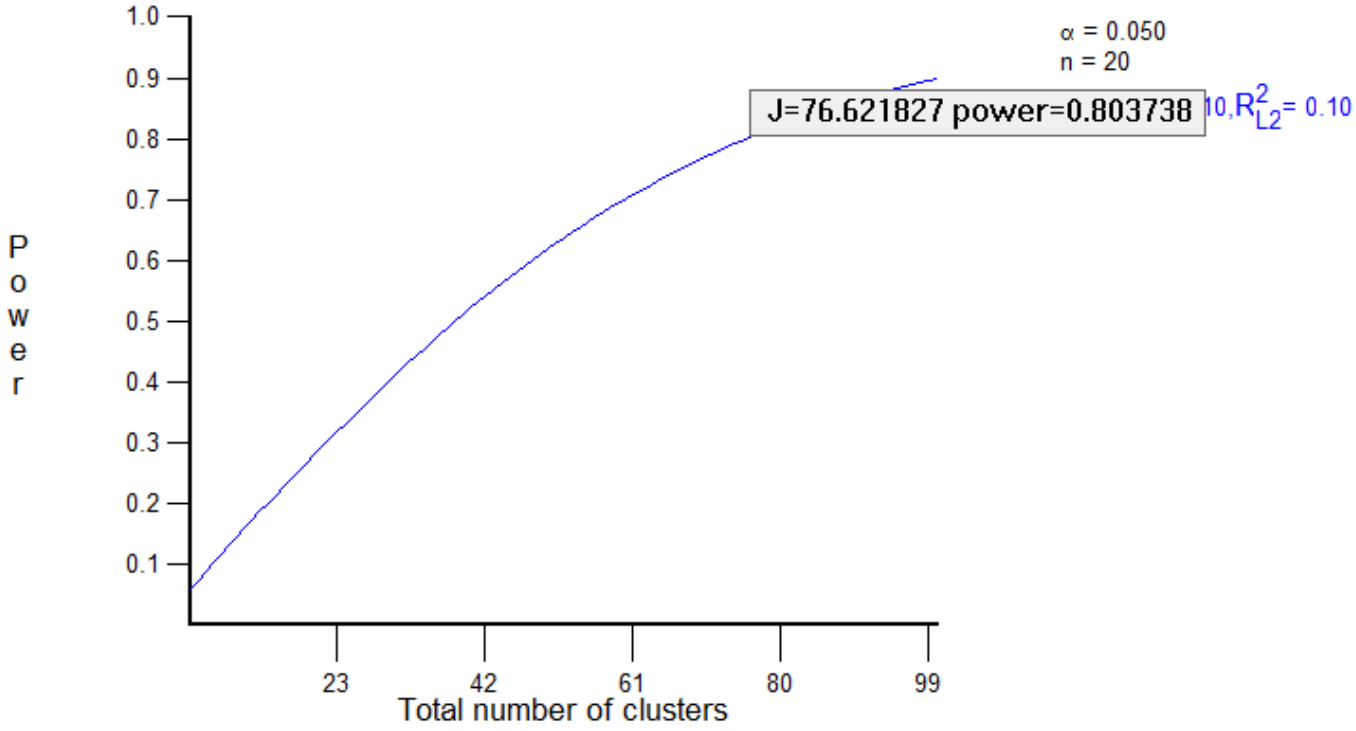
- Incremental effect size for treatment 2

$$d = \frac{[(4.13 \times 0.1) + 4.13] - 4.13}{1.72}$$

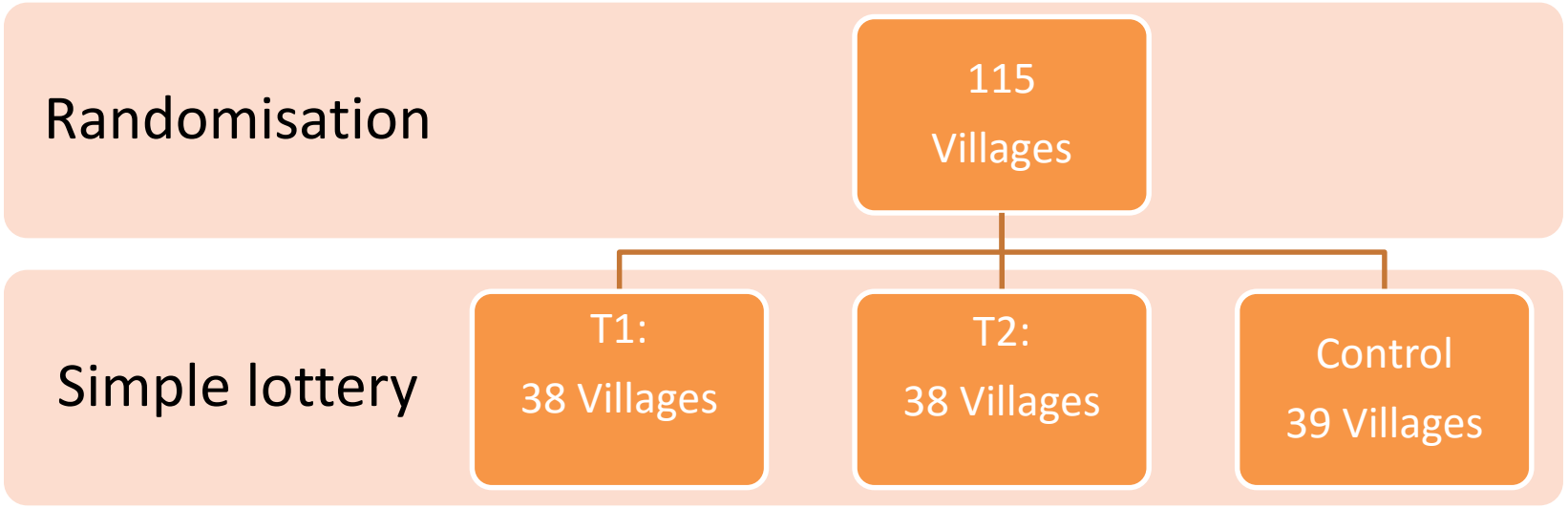
$$= \mathbf{0.24}$$

Data and Sample Size

Power Cluster
Village sample size: 77
Household sample: 20 per village



Sample Size



Total sample size: 3x (77/2) = 115 villages
115 villages x 20 households
= 2300 households

Potential challenges

- Spillover: geographically spread out treatment and control villages to minimize the spillover potential.

- Attrition:
  - Risk 1: Temporary labour migration
    - Baseline and endline survey to be implemented at planting/harvesting season.
  - Risk 2: Farmers preoccupied with farm work
    - Incentive to participate in survey
  - Risk 3: Treatment envy/disinterest in control group
    - Incentive to participate in survey

Results

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- Why useful?
  - Addresses MDG goals;
  - Improves the health status of children;
  - Alleviation of rural poverty level.
- Interested stakeholders
  - Ministry of Health,
  - Ministry of Agriculture
  - NGO's
  - Seed industries
- How would you disseminate them.
  - Publish journal papers
  - Press releases
  - Include stakeholders in the evaluation
  - Conferences, Talks

Thank-you