

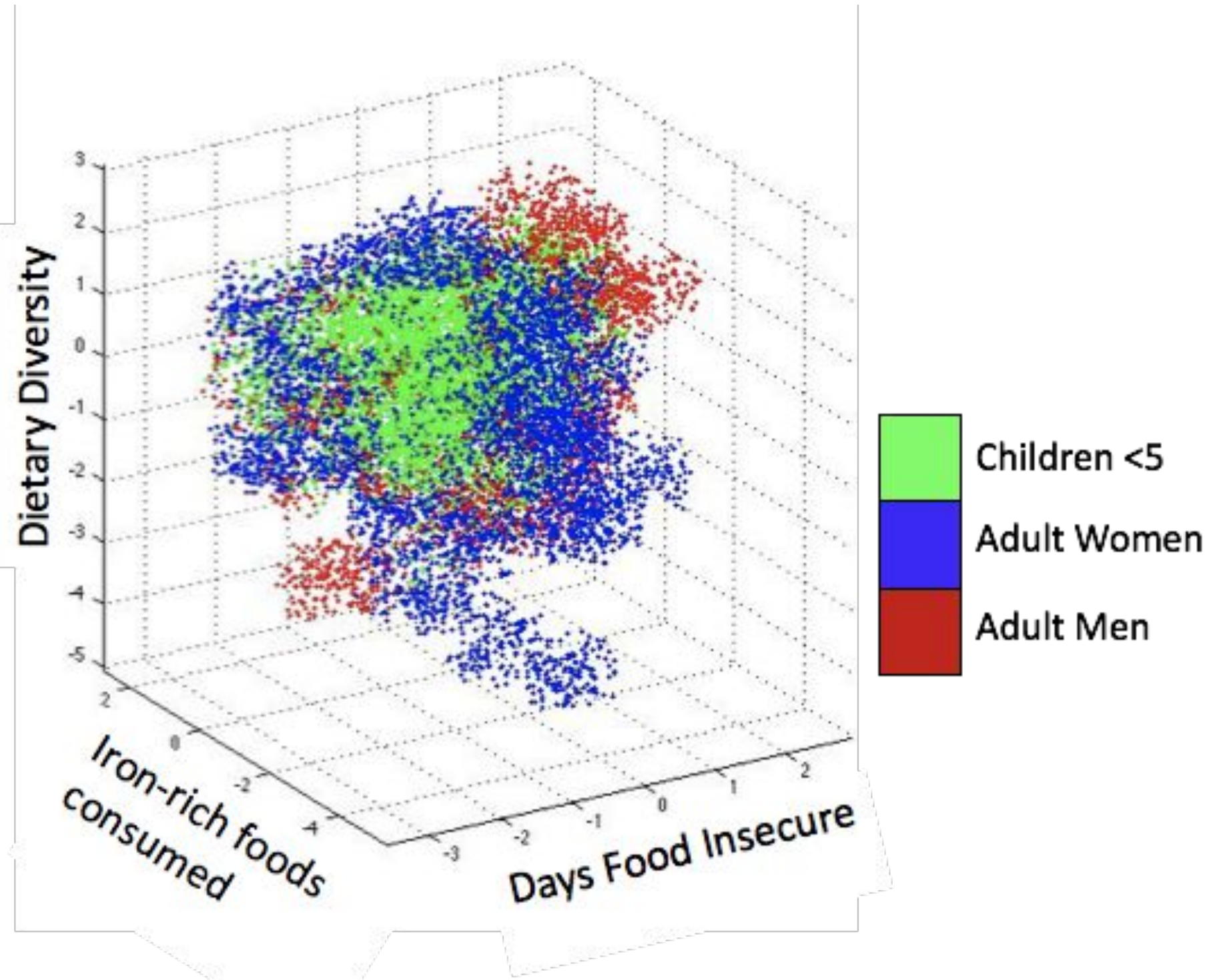
The Multidimensionality of Food Security

Hypergeometry for measuring food security in RHoMIS sites

Christine Lamanna, Todd Rosenstock, Suneetha Kadiyala, Jim Hammond, Mark van Wijk,  
and the RHoMIS data contributors

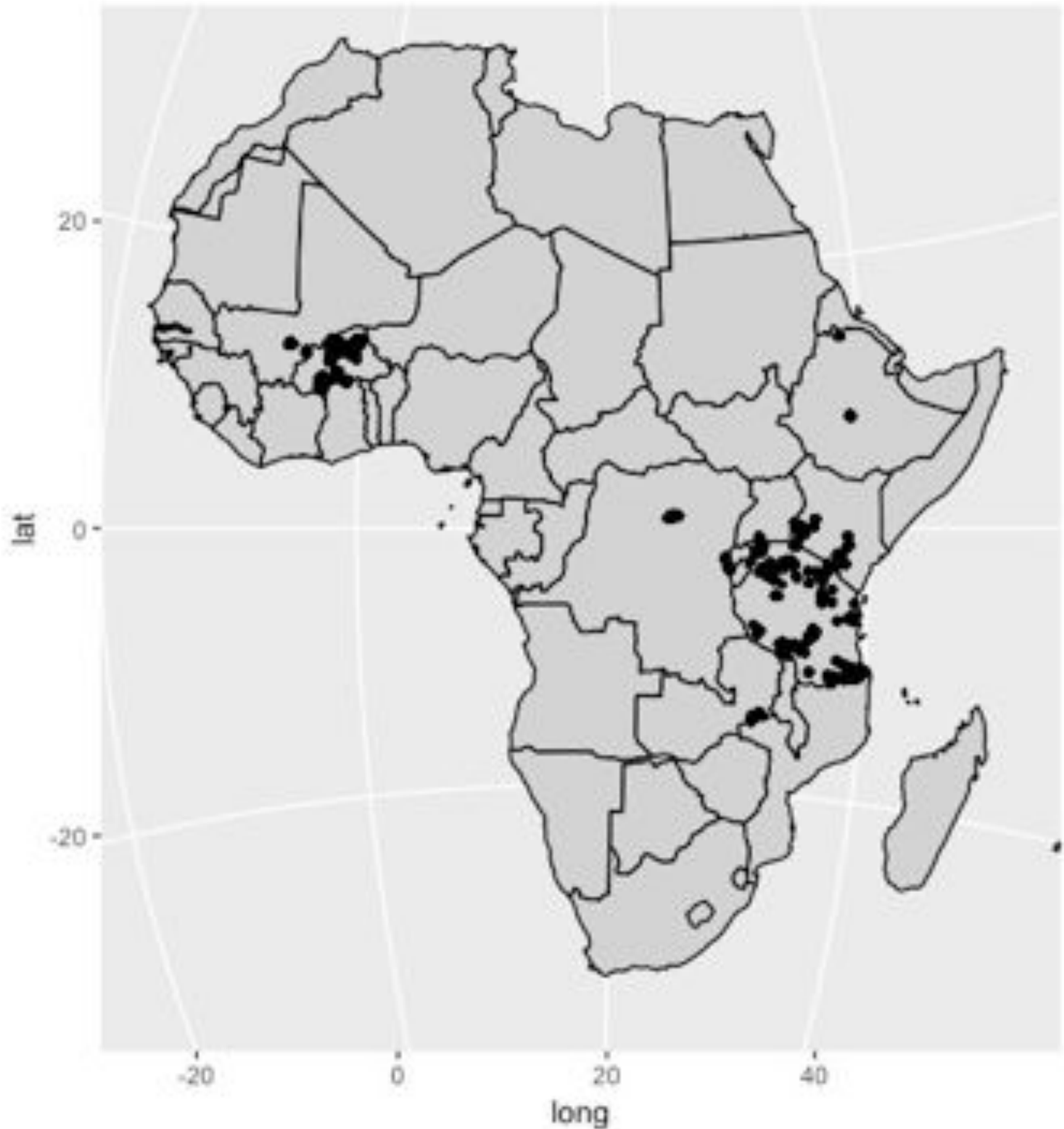
How to measure multidimensional food security?

Food security is a multidimensional concept. It's not simply whether a family has enough food, but if they have adequate nutrition and sanitary conditions, economic and physical access to diverse, healthy foods, and consistency of that access over time. We also know that there are many drivers of food security, including climate, agriculture and household decision making, many of which are captured in RHoMIS. We tested whether we could use RHoMIS data to come up with a multidimensional metric of food security that would enable better development and humanitarian responses to food insecurity. We used a technique called **HYPERVOLUMES**:



A **Hypervolume** is just the amount of space occupied by a group of points in 3 or more dimensions.

Locations

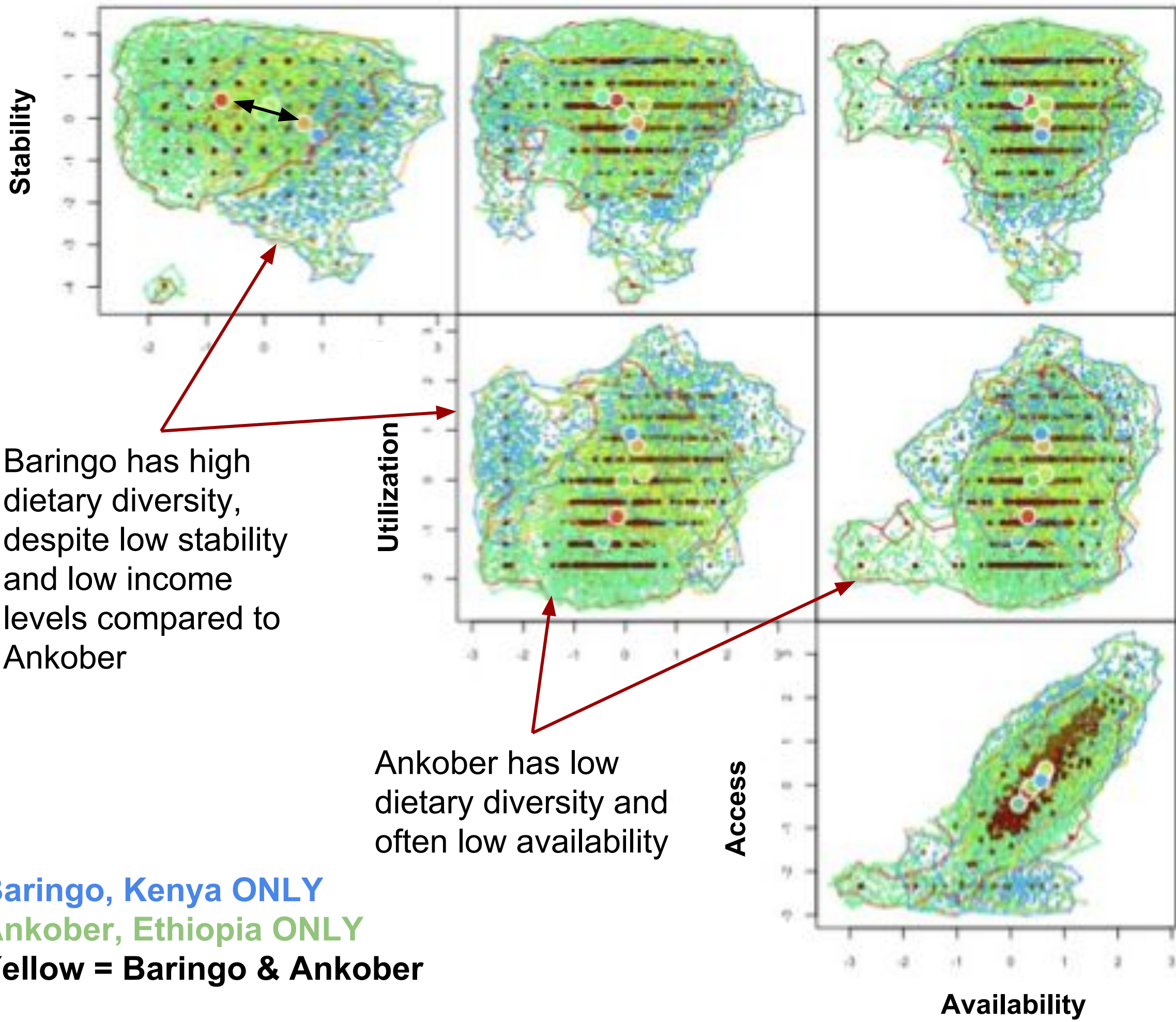


We used all available RHoMIS sites in Sub-Saharan Africa. Survey runs were kept intact, but large national level surveys were clustered geographically where possible, to create **35 communities of about 200 households and 2000 km² or smaller**.

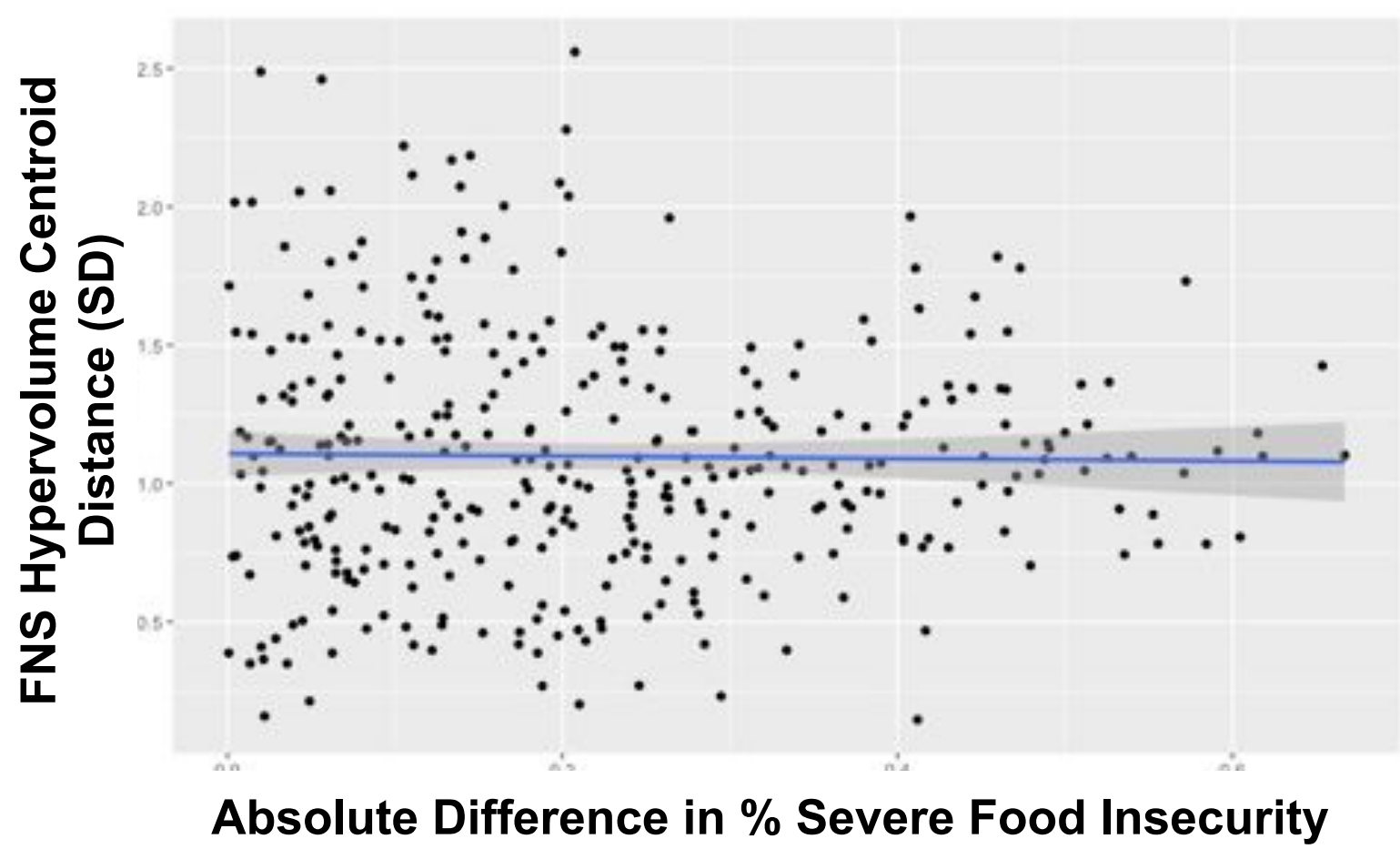
Indicators

Food Security Dimension	Definition	RHoMIS Indicator
Availability	Physical availability of food, sufficient quantity & quality of food.	Food Availability
Access	Physical & economic access to available food	Total Income, PPI
Utilization	Contribution of food to health & nutritional status of households	Household Dietary Diversity (Good Season, Bad Season), WASH
Stability	Temporal stability of food availability, access & utilization	Number of Months Food Insecure
Overall	Overall food security	HFIAS

A food security hypervolume...

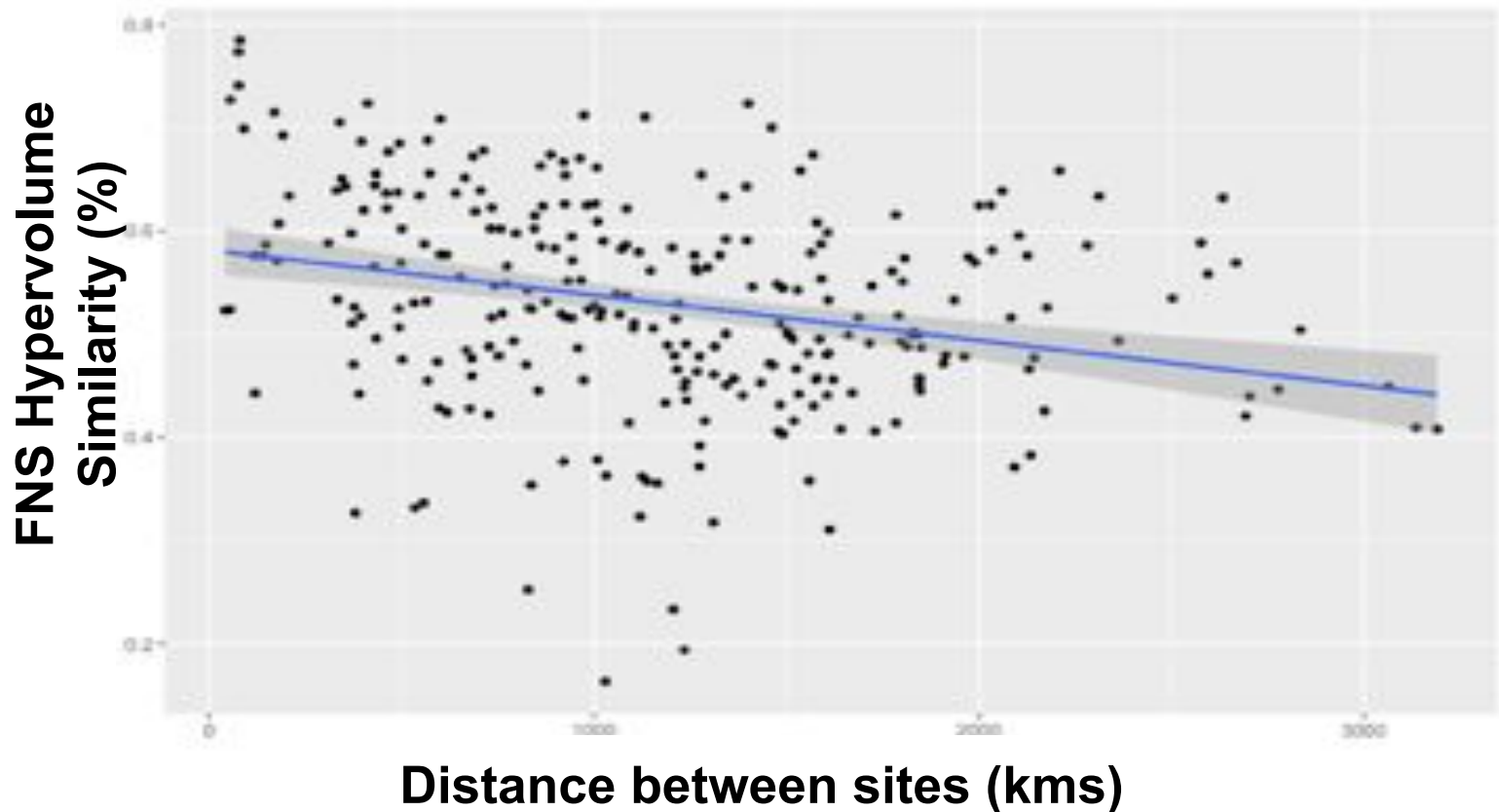


...tells us more than HFIAS...



The difference between two communities in the proportion of the population with **Severe Food Insecurity** has no relationship with the difference between those communities in multidimensional **Food & Nutrition Security Space**, as measured by the distance between hypervolume centroids.

...but something else is going on!



The Food & Nutrition Security similarity between two communities decreases with distance between the communities. What kinds of processes would lead to a geographic signal in FNS similarity?

Hypervolumes could be a useful tool for diagnosing food insecurity and designing effective interventions in diverse development contexts.

Next Steps:

- What causes distance decay in food security similarity?
- What are the drivers of food security's dimensions?
- Can we use the method to compare population segments? (gender, age, wealth, etc.)