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Empirical Requirements of Resilience Measurement
Focus on Shocks and Stressors

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FSIN
Food Security Information Network

USAID
FROM THE AMERICAN PEOPLE

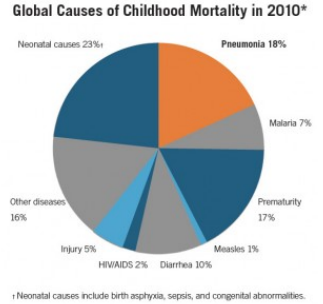
CRS
CATHOLIC RELIEF SERVICES

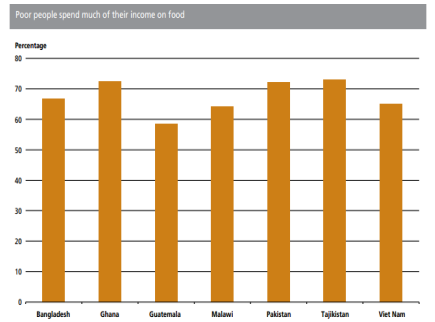
Background

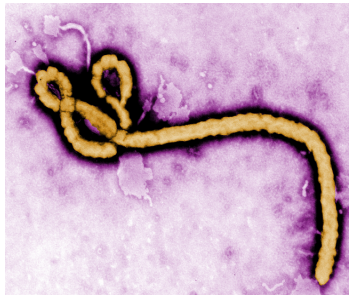
- **Rationale for improved shock measurement**
  - Core variable in resilience analysis
- **Motivation**
  - Empirical and methodological

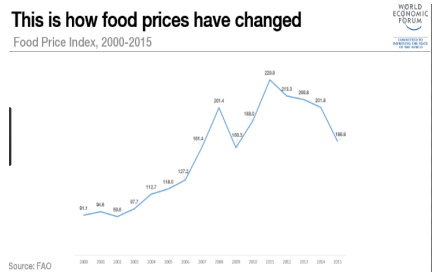
Empirical Motivation – What needs to be measured?

Droughts **Floods** **Pests** **Political Conflicts** **Diseases** **Food Prices**









Interactions

Individual and combined effect of shocks and stressors on well-being

Immediate Mortality **Diminished Health** **Loss of Livelihoods** **Economic Instability** **Food Insecurity** **Personal Safety** **Social Welfare**

Methodological Motivation

- **Sensitivity to resilience**
  - Focused measurement of shocks
  - Well-being over time
- **Higher/appropriate frequency & longer/appropriate durations**
  - Consider rates of change, volatility, and durability
- **Lower burden**
  - Protection against fatigue and attrition
- **Programmatically integrated**
  - Maximize alignment and minimize attrition

Empirical Study: Context

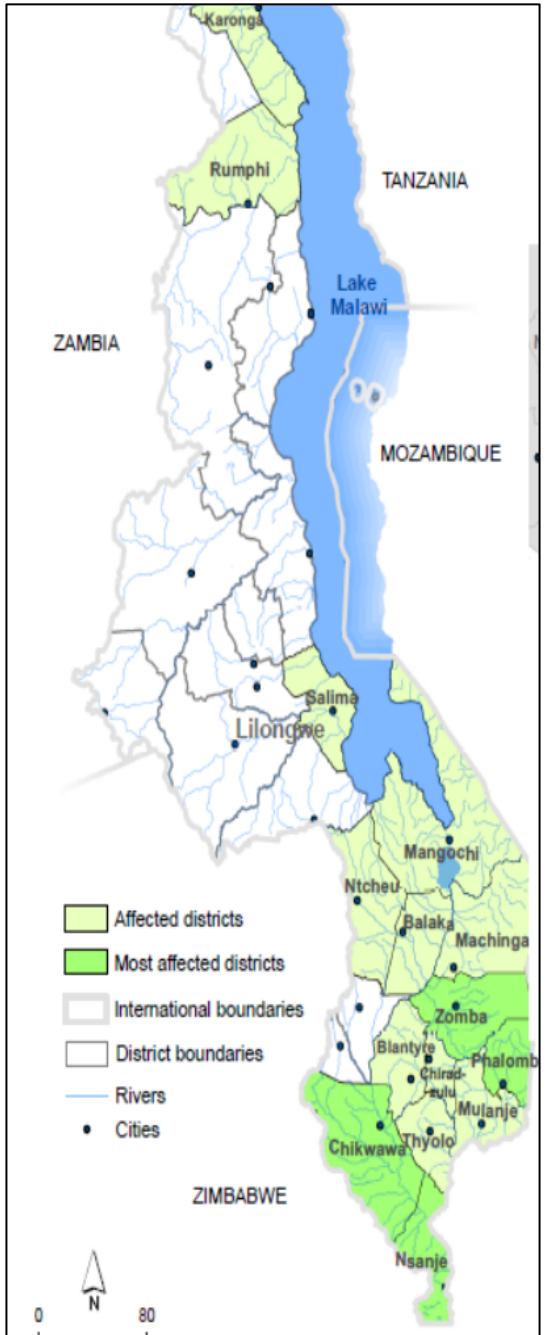
Malawi/Chikwawa

- 2015 flooding displaced an estimated 230,000 people & damaged about 64,000 hectares of land
- Followed by drought in brought on by El Nino
- An estimated 3 million people are vulnerable to famine (FAO)

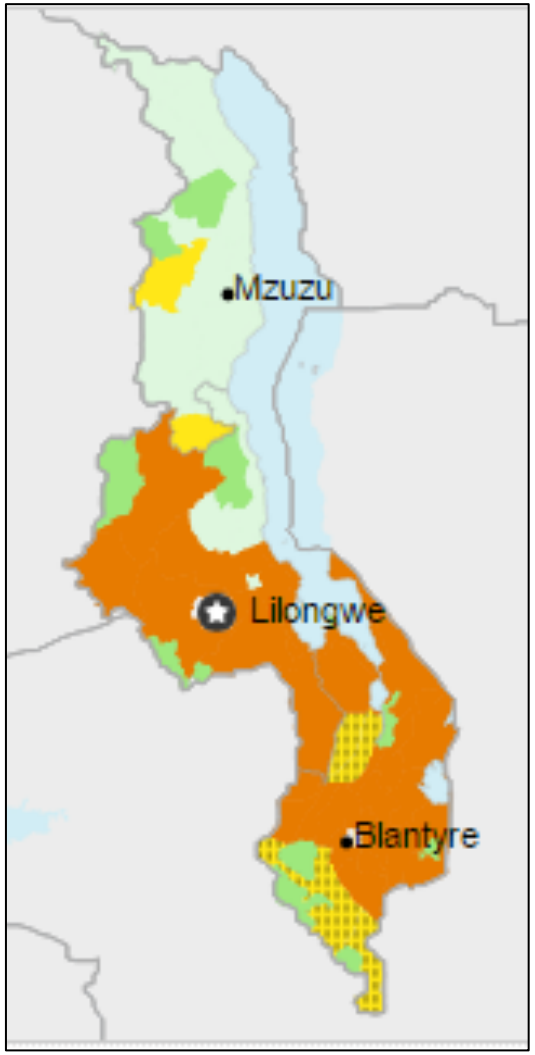
UBALE -United in Building and Advancing Life Expectations

- Overlapping interventions to reduce malnutrition and build resilience.
- UBALE program plans to work with 235,000 households between 2014 and 2019

2015 Flood



2016 Drought



IPC 2.0 Acute Food Insecurity Phase

Malawi Study: Measurement Indicators for Resilience Analysis (MIRA)

Focus on Shock Metrics for Resilience Analysis

MIRA Protocol

- Monthly low-burden cell-phone based surveys, 15 min max..
- Village level, administered by local program staff
- Shock module, asset module, HH characteristics module, CSI..

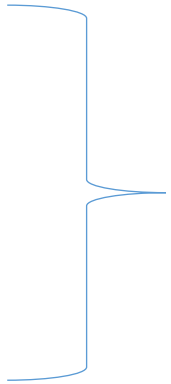
Focus on Shock Module for Resilience Analysis

Weather Shocks	Agriculture Shocks	Economic Shocks	Household Shocks	Health Shocks
• Drought • Flood • Wind damage	• Crop pest/disease • Livestock – death or disease	• Business failure • Loss of job/non-payment of salary • End of regular assistance/aide • End of remittance from outside HH • Fall in crop prices • Rise in prices of food	• Death in household • Break-up of the household • Theft • House damaged due to fire	• Cholera or other serious illness

Analysis of Shocks for Resilience Analysis

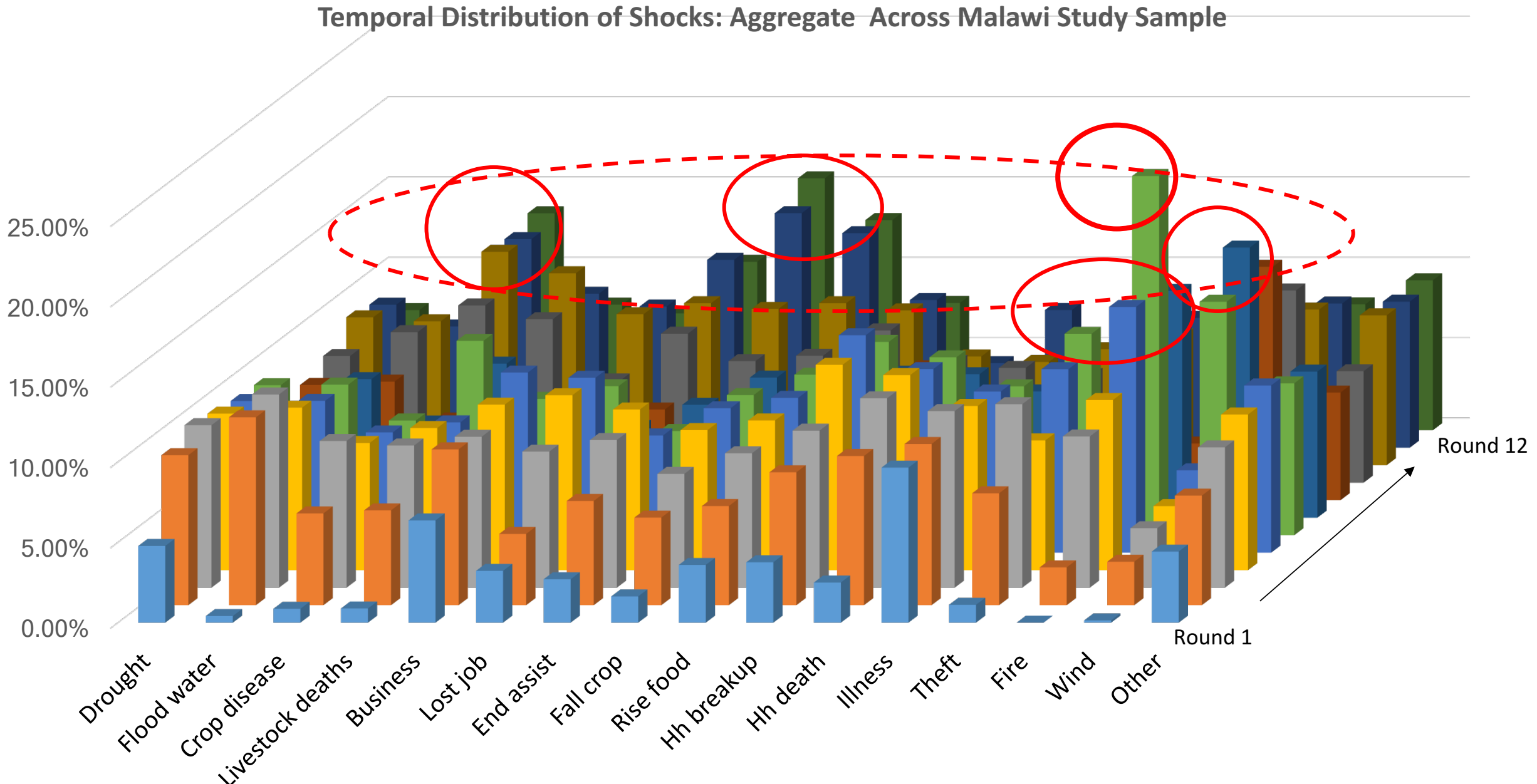
Results

- **Temporal properties of shocks**
  - Distribution of single shocks over time
- **Shock combinations**
  - Most common combinations
- **Spatial properties of shocks**
  - Concentration and dispersion across sites



Multiple correspondence analysis

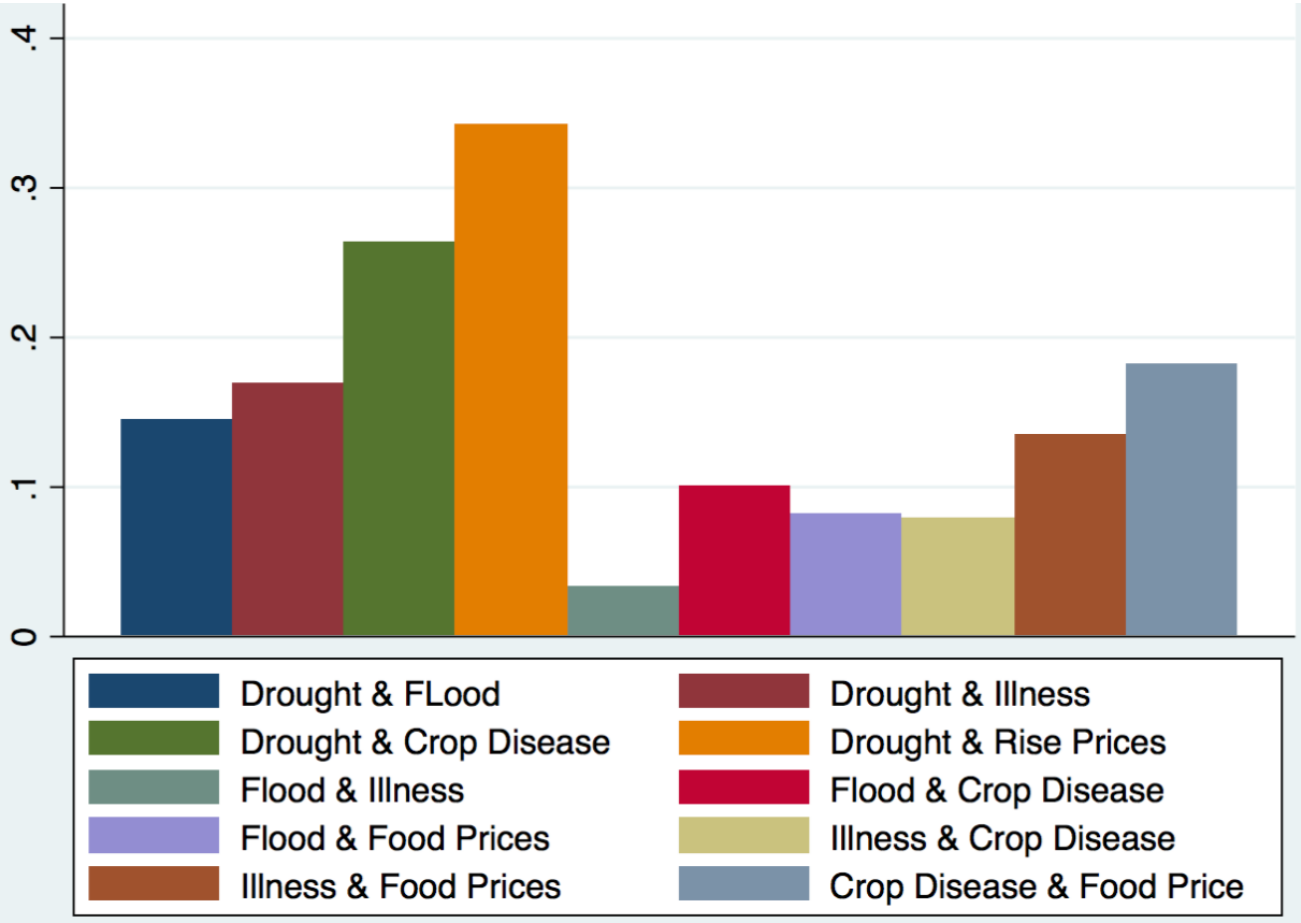
Distribution of Single Shocks Over Time



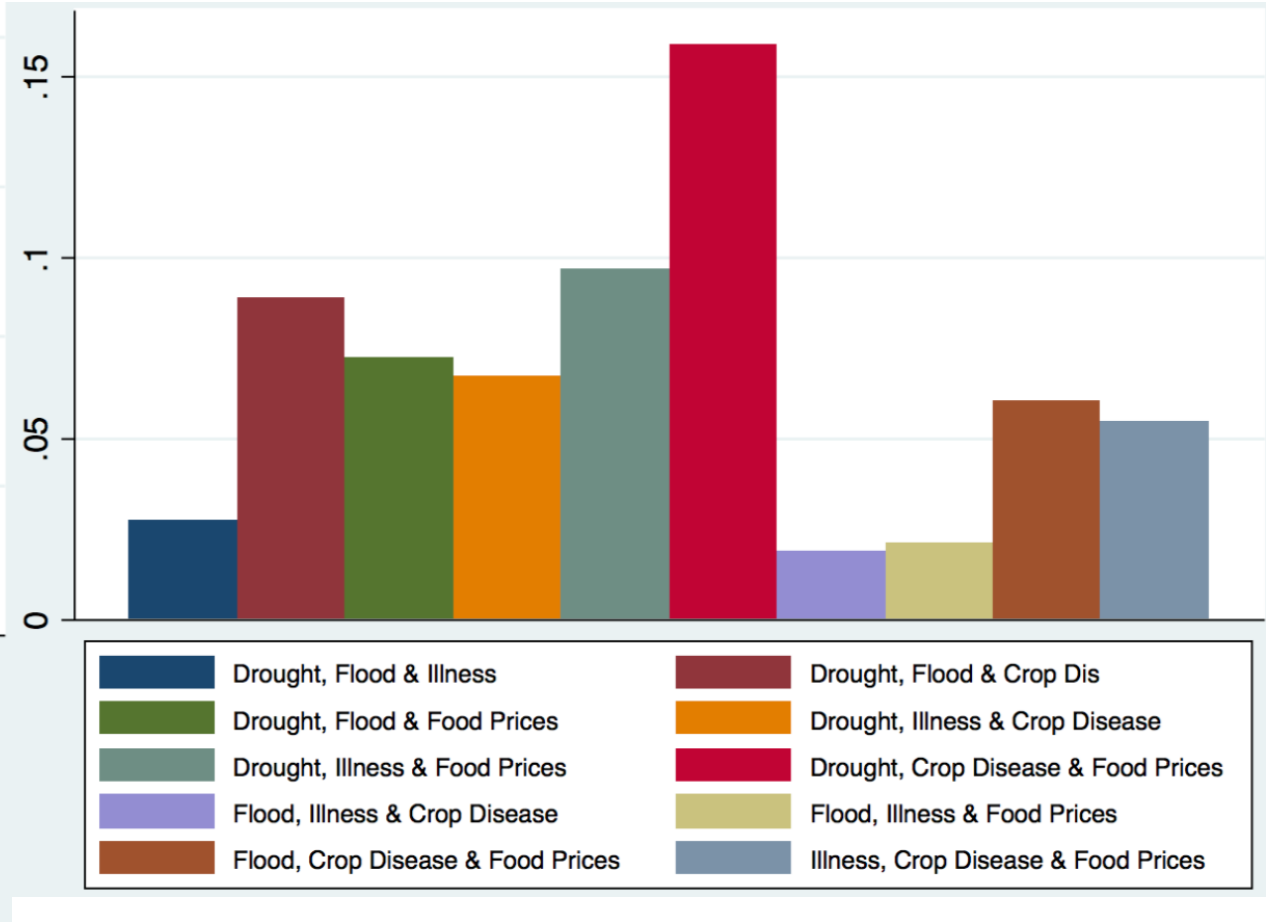
Examining shock combinations

Single round or time period

Two Shock Combinations



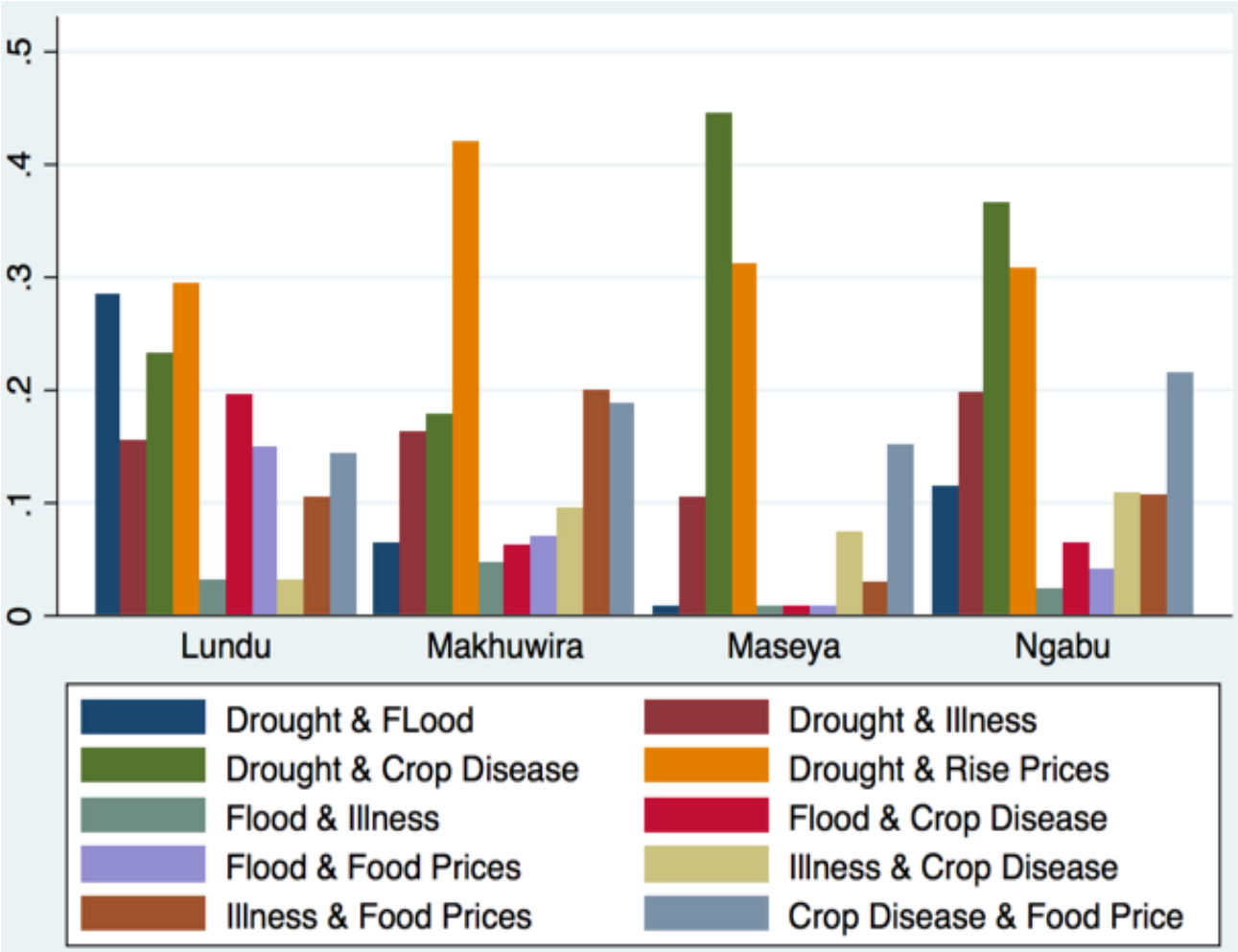
Three Shock Combinations



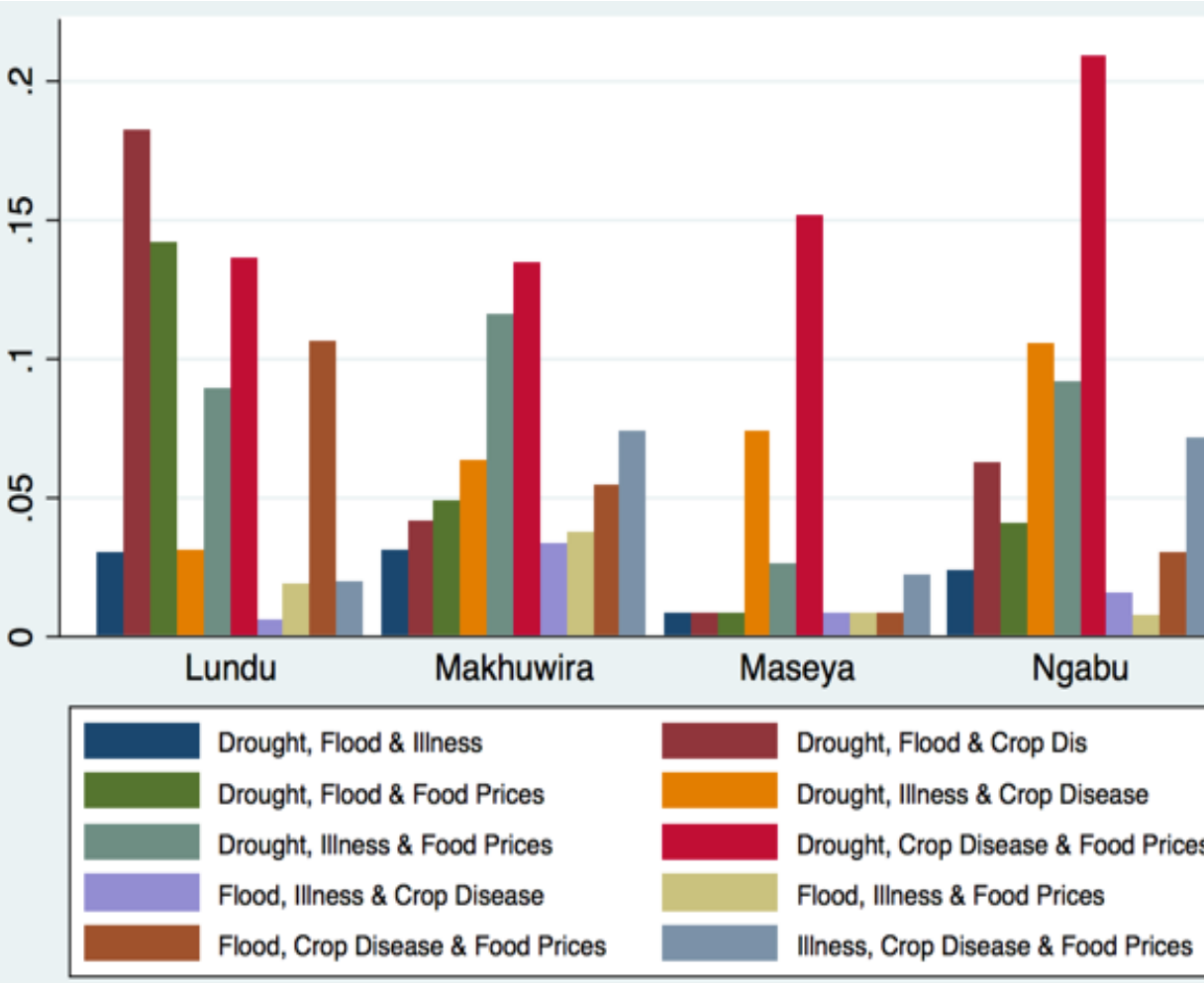
Frequency of Shock Dyads and Triads: by Traditional Authority

Single round or time period

Two Shocks

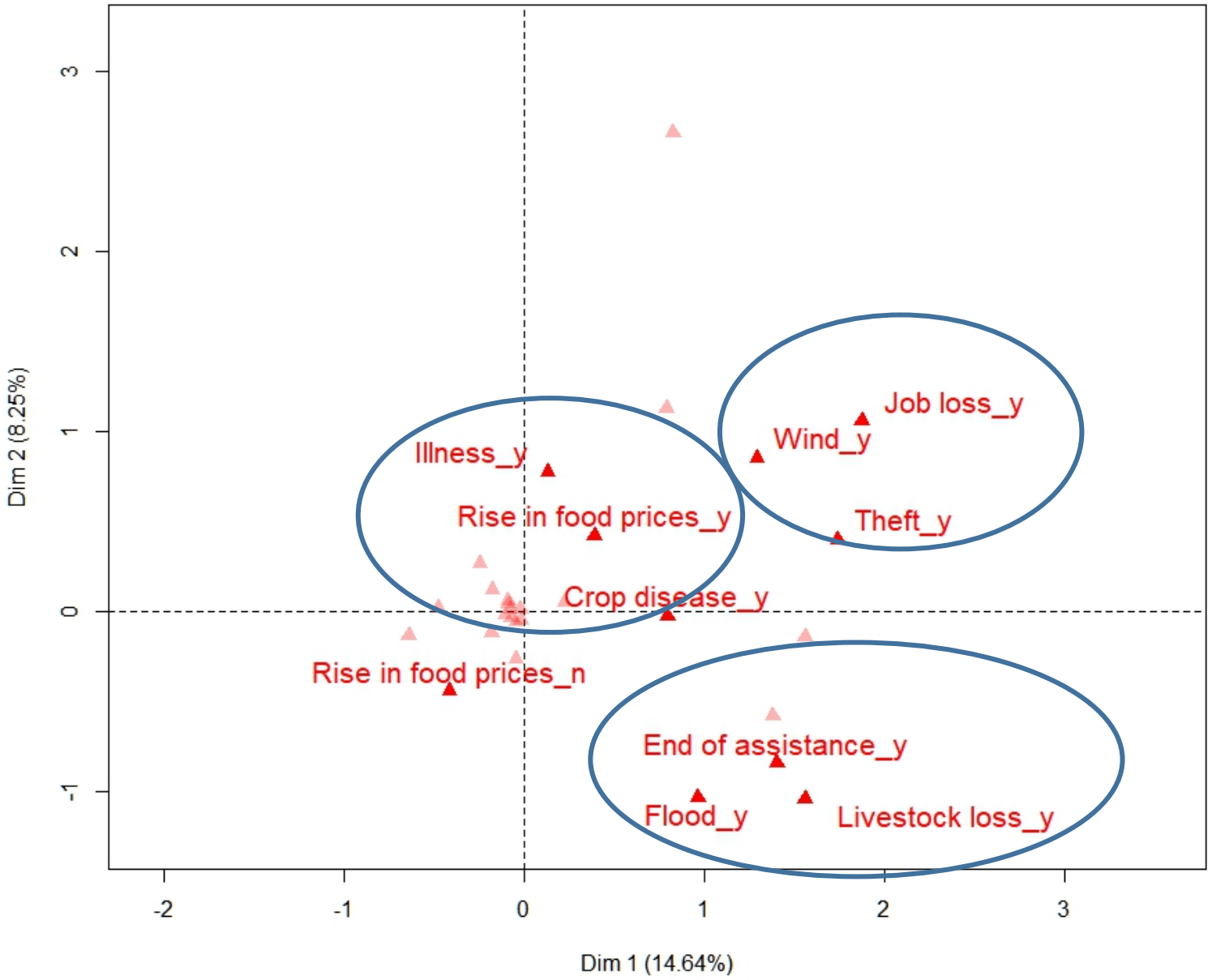


Three Shocks



Shock Combinations

Findings from Multiple Correspondence



Interpretation

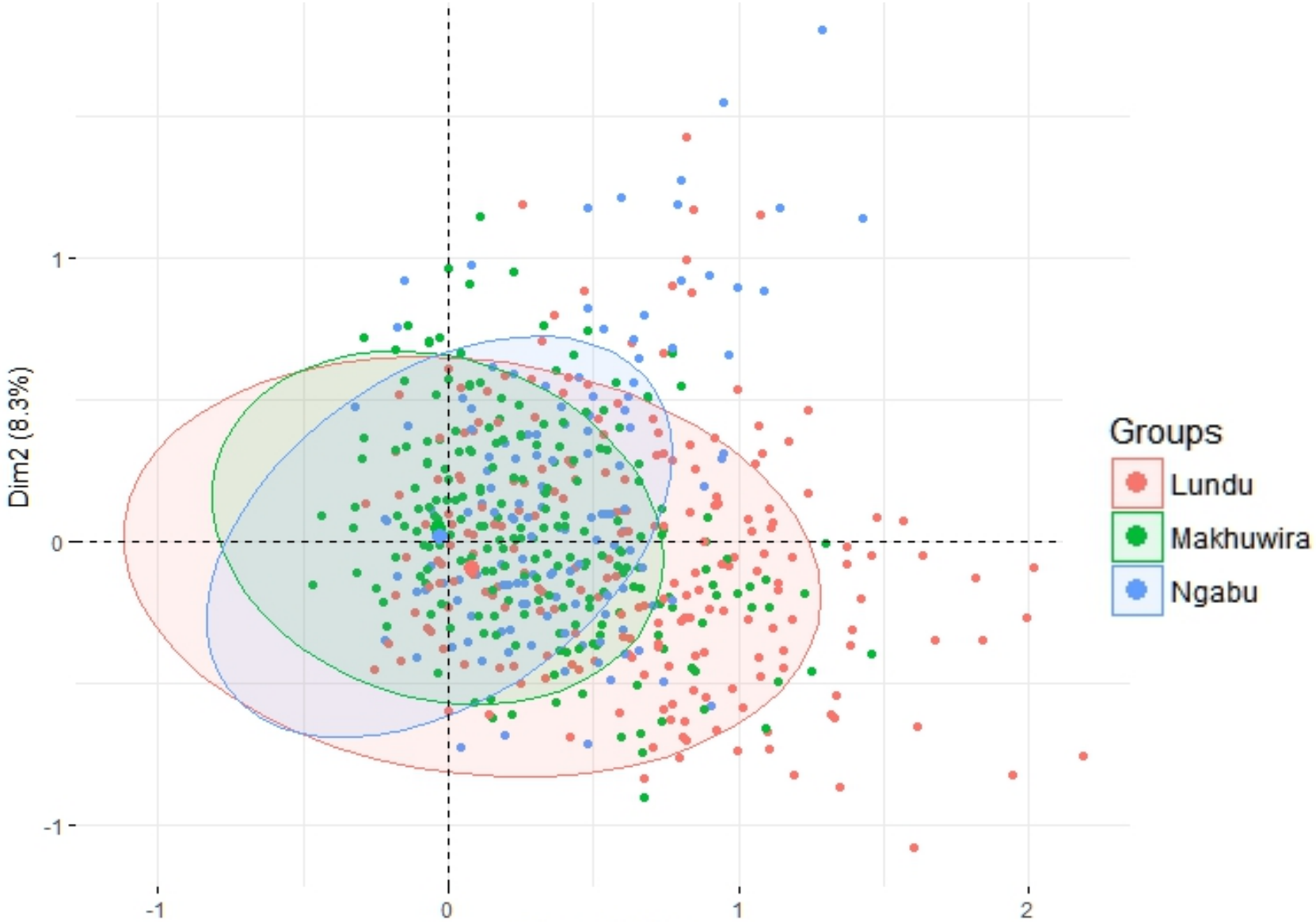
First set -Job loss, wind, and theft - best fit for 1st dimension

Second set- end of assistance, flood, livestock loss - best fit for 2nd dimension

Third set – illness, rise in food prices crop disease – best for both dimensions

Shock Combinations

Focus on Spatial Variation-Concentration



Conclusion Part

Four Opportunities to Improve the Resilience Measurement

- **Opportunity 1:** Measure how shocks and stressors interact
  - Need for Multidimensional shock index
- **Opportunity 2:** Examine temporal aspects of shocks and stressors
  - Persistent effects & shock propagation effects
- **Opportunity 3:** Model interactions and cumulative effects
  - Sensitivity to temporal dynamics and shock combinations
- **Opportunity 4:** Apply analytical techniques exploit data density
  - Greater precision by leveraging high frequency data set +75,00 data points

Next Steps

- Shock Components Index
- Combine with resilience analysis

Understanding of shock dynamics-> prediction of observed well-being variability

Better Evidence for Targeting and Decision Making

Thank you!

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