Intra-household Distribution and Intensity of Food Insecurity in Kyrgyzstan

using Food Insecurity Experience Scale (FIES) and the Life in Kyrgyzstan (LiK) data 2019

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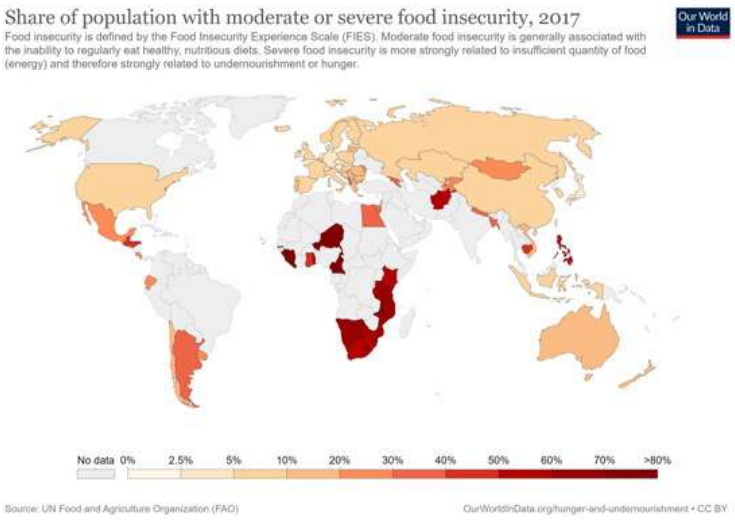
Outline

1. Motivation and research gaps
2. FIES and data validation
3. Data and sample
4. Prevalence of food insecurity
5. Intra-household distribution and intensity
6. Summary and next steps

Motivation

- The Food Insecurity Experience Scale (FIES) is one of the indicators for monitoring SDG Target 2.1
- It measures the prevalence of moderate and severe food insecurity (FI) in a population
- Is the 1st internationally comparable scale at the individual / household level



Motivation-2

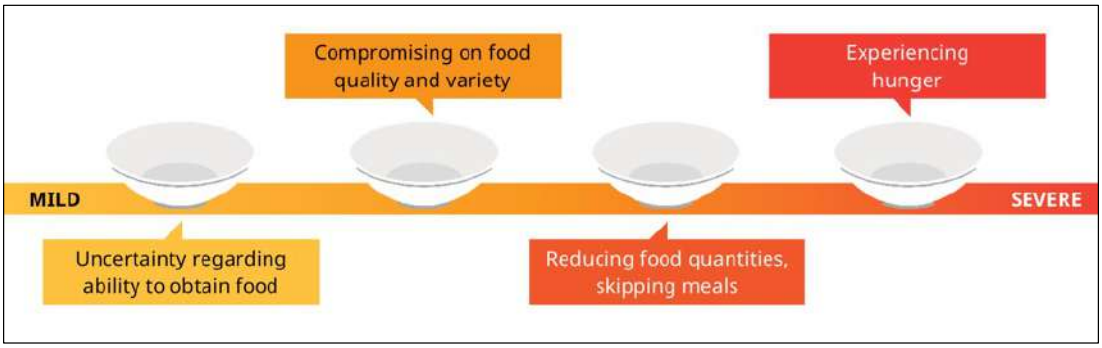
- Created by FAO's Voices of the Hungry Project in 2013/2014
- Subjective measure – asks people directly
- Built on previous decades of research on experience-based FI scales which identified common patterns of FI:
    1. Worry about lack of food
    2. Changing diets to make food last longer
    3. Decreasing amount of food consumed
- Represents the larger shift in food security measurement from dietary energy adequacy to measurements that include social, economic and psychological factors (Cafiero et. al, 2014)
- Added to Gallup World Poll (GWP) in 2014 – data from GWP used to validate scale was able to consistently measure FI across countries and contexts

Research Gap

- Most existing research on the FIES has used data from the GWP; global and regional studies on food insecurity and migration, political stability, marginalized groups, life satisfaction and gender disparities
- FAO recommends the FIES questions be added to existing household surveys – *there is a lack of information on how the FIES performs in larger surveys*
  - Larger sample size
  - Broader range of questions vs. GWP
  - Intrahousehold differences in FI experience
- Opportunity to compare GWP prevalence rates to another data source

FIES Description-2

- The number of questions answered "1-2 times " and "Many times" are then tallied into a raw score between 0 and 8
- However, before categorizing raw scores into food insecurity severity categories the FIES data must be analyzed using the Rasch Model…



Source: FAO

FIES Description -1

- The FIES comprises of 8 questions of self-reported food behaviors that are sequenced per degree of difficulty in accessing food

- *During the last 12 months, was there a time when, because of lack of money or other resources:*
  1. You were *worried* you would not have enough food to eat?
  2. You were unable to eat *healthy* and nutritious food?
  3. You ate only a *few* kinds of foods?
  4. You had to *skip* a meal?
  5. You *ate less* than you thought you should?
  6. Your household *ran out* of food?
  7. **You were *hungry* but did not eat?**
  8. **You went without eating for a *whole day*?**

- Response options: *Never; 1-2 times; Many times*

Data Validation: The Rasch Model

- The Rasch Model is used to determine that each FIES question is measuring a different aspect of food insecurity
- Infit/Outfit Statistics: used to flag presence of outliers, unexpected response patterns, redundant items
- Residual Correlation Matrix: high correlation can indicate 2 items are measuring the same aspect and one of them can be redundant
- Rasch Reliability: discriminatory power of overall scale

FIES Items	% of positive responses	Item severity	Standard Error	Infit	Outfit
WORRIED	24.7	-2.70	0.07	1.23	3.15
HEALTHY	19.3	-1.45	0.06	0.85	0.99
FEWFOOD	17.1	-1.30	0.06	0.96	1.23
SKIPPED	11.0	0.65	0.08	0.90	0.71
ATELESS	10.7	0.37	0.07	0.89	0.89
RUNOUT	9.5	0.73	0.08	0.93	0.92
HUNGRY	8.6	1.73	0.10	0.84	0.88
WHLDAY	8.2	1.96	0.11	1.02	0.95

FIES Data Validation

- The *outfit* for WORRIED is higher than 2, indicating there are some unexpected response patterns; all *infits* are within an adequate range.
- Rasch reliability score is 0.75 (the proportion of variability in the data that is explained by the Rasch model) is above the acceptability threshold of 0.70
- Residual correlation between the HUNGRY and WHLDAY questions are slightly above the 0.4 threshold - meaning it is possible they overlap in measuring the same aspect of food insecurity (table below)

	worried	healthy	fewfood	skipped	ateless	runout	hungry	whlday
worried	1.00							
healthy	0.22	1.00						
fewfood	-0.13	0.21	1.00					
skipped	-0.24	0.04	0.05	1.00				
ateless	-0.23	-0.13	0.03	0.19	1.00			
runout	-0.22	-0.13	-0.04	0.06	0.27	1.00		
hungry	-0.21	-0.09	-0.13	0.13	0.16	0.22	1.00	
whlday	-0.28	-0.12	-0.18	0.11	0.07	0.16	0.44	1.00

Food Insecurity: How to Calculate?

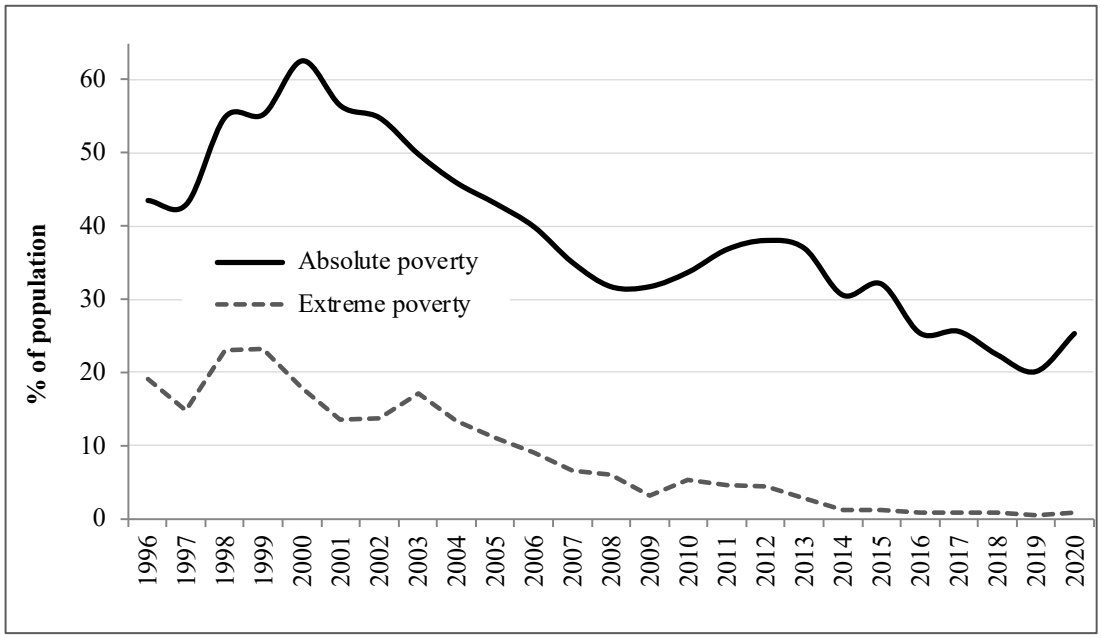
Discrete Assignment

- Uses raw score cut offs
- Mild – 1-3
- Moderate FI: 4-6
- Severe FI: 7-8
- Difficult to make international comparisons
- **What we are using

Probabilistic Assignment

- Equates FIES data with Global Reference Scale
- Uses equated cut off thresholds to estimate the probability each raw score falls under moderate or severe FI
- Prevalence rates are internationally comparable

Poverty in Kyrgyzstan



Source: NSC

Data Source is LiK

- The 'Life in Kyrgyzstan' Study (LiK Study) is a multi-topic panel survey of households and individuals in Kyrgyzstan.
- Initial sample in 2010 was 3,000 households and 8,000 individuals who are tracked over time
- The sample is representative at national, rural/urban, and South/North.
- Six waves are collected so far: 2010-2013, 2016, 2019

- We use Wave 6 of the LiK study collected during Nov 2019 – Feb 2020
- Sample: 2,316 households, 7,044 adults, 700 youth (14-17 y.o.)
- FIES questions asked individually
- A rich set of socio-economic characteristics at individual, household, and community levels

Analytical Sample

We analyze the data from the respondents aged 14+ with complete data on FIES and demographic information

	Analytical sample	*% to total*	Dropped	*% to total*
Total	**6,447**		**2,881**	
North	3,153	*49*	722	*25*
South	3,294	*51*	2,159	*75*
Urban	2,057	*32*	625	*22*
Rural	4,390	*68*	2,256	*78*

Prevalence of Food Insecurity

We estimate the level of moderate and severe food insecurity at 11% at individual level and 13% at household level

Level	Total	Food Secure	Food Insecure	Mild	Moderate	Severe
Indvidual	6,447	4,816	1,631	879	205	547
%		*75*	*25*	*14*	*3*	*8*
Household	2,188	1,342	846	561	159	126
%		*61*	*39*	*26*	*7*	*6*

Source: LiK 2019.

Note: Household-level food insecurity rates are calculated based on the average of individual raw scores among responded members.

Descriptive statistics

	Total	Food secure	Food Insecure	Diff.
Individual characteristics				
Female	0.52	0.52	0.55	***
Age, years	40	39	42	***
Kyrgyz	0.67	0.69	0.62	**
Uzbek	0.15	0.12	0.25	***
Years of schooling	11.1	11.2	10.7	***
Employed	0.48	0.51	0.42	***
Has strong social network	0.41	0.42	0.39	**
Life satisfaction, 0-10 scale	7.3	7.5	6.5	***
Satisfaction w.health, 0-10 scale	6.4	6.6	5.6	***
Mental health issues, 0-not at all; 27-heavy	2.1	1.6	3.5	***
Household characteristics				
HH size, incl.absent members	6.6	6.4	7.1	***
HH has access to clean drinking water	0.80	0.81	0.77	*
HH has reliable electricity supply	0.82	0.84	0.76	***
Food consumption per capita, soms/month	3,704	3,726	3,639	
Consumption per capita, soms/month	6,632	6,806	6,118	***
HH income per capita, Soms/month	6,363	7,049	4,348	***
Location				
Rural dummy	0.68	0.66	0.74	***
South oblasts	0.51	0.45	0.69	***
# of obs.	**6,447**	**4,816**	**1,631**	

Source: Life in Kyrgyzstan Study 2019.

Note: The means for food secure individuals are compared to food insecure individuals using t-tests.

Significant differences are indicated by * p<0.1, ** p<0.05, *** p<0.01.

Intra-household food insecurity

In two-third of food insecure households, the members experience food insecurity differently

	Total	Food Secure	Food Insecure	Mild	Moderate	Severe
Total # of households	2,188	1,342	846	561	159	126
# of food insecure households with differing responses	584	0	584	444	123	17
in %	*27*	*0*	*69*	*79*	*77*	*13*

Source: Life in Kyrgyzstan Study 2019.

Within-HH food insecure and secure

Inequality in food security within households appear to be driven by age

	Total	Indiv.FI<=mean HH	Indiv.FI>mean HH	Diff.
Individual characteristics				
Female	0.52	0.49	0.55	**
Age, years	39	36	43	***
Kyrgyz	0.61	0.61	0.61	
Uzbek	0.23	0.23	0.24	
Years of schooling	10.6	10.6	10.6	
Employed	0.41	0.42	0.40	
Has strong social network	0.37	0.35	0.39	
Life satisfaction, 0-10 scale	7.0	7.3	6.7	***
Satisfaction w.health, 0-10 scale	6.1	6.5	5.6	***
Mental health issues, 0-not at all; 27-heavy	2.4	1.9	3.1	***
Household characteristics				
HH size, incl.absent members	7.6	7.7	7.4	***
HH has access to clean drinking water	0.80	0.80	0.80	
HH has reliable electricity supply	0.81	0.81	0.80	
Food consumption per capita, soms/month	3,288	3,214	3,393	***
Consumption per capita, soms/month	5,692	5,576	5,859	***
HH income per capita, Soms/month	4,316	4,395	4,204	
Location				
Rural dummy	0.75	0.76	0.74	
South oblasts	0.66	0.66	0.66	
# of obs.	**2,067**	**1,215**	**852**	

Source: Life in Kyrgyzstan Study 2019.

Mixed vs equal responses in FI HHs

Mixed response households have lower raw score, more HH members, and lower consumption

Variable label	Food insecure HHs	Equal responses	Mixed responses	Signif.
Hh raw score, 1-8	3.1	4.7	2.4	***
HH size, incl.absent members	6.4	5.3	6.9	***
HH has access to clean drinking water	0.79	0.73	0.81	
HH has reliable electricity supply	0.78	0.74	0.80	
Food consumption per capita, soms/mon	3,813	4,442	3,531	***
Consumption per capita, soms/month	6,479	7,247	6,135	***
HH income per capita, Soms/month	4,688	5,148	4,491	
Rural dummy	0.73	0.72	0.74	
South oblasts	0.66	0.66	0.66	
No of obs	**846**	**262**	**584**	

Intensity of food insecurity

28% of food insecure individuals have experienced the condition many times

	Total	Moderate	Severe
# of moderate & severe food insecure indviduals	724	200	524
# of individuals with many incidences of FI	201	23	178
%	*28*	*12*	*34*

Source: Life in Kyrgyzstan Study 2019.

Summary

1. We analyze a novel tool that measures food insecurity experience, FIES.
2. We use data from Life in Kyrgyzstan Study for 2019.
3. Innovations: surveyed all members aged 14+ and asked about frequency of experience.
4. Sample size is 6,447 individuals from 2188 households
5. We estimate food insecurity prevalence at 11%
6. In 69% of food insecure households, members have differing responses – older members tend to report higher level of food insecurity.
7. About 28% of food insecure respondents have experienced it more than once.