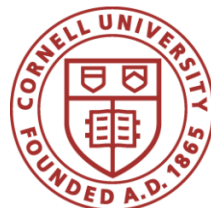


# Empowerment and women's wellbeing: A comparison of widely used empowerment metrics

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# Project goals

1. Comparatively examine widely used empowerment metrics in a single sample
  - How do they relate to each other?
  - How do they relate to key outcomes related to women's wellbeing?
2. Provide practical insight/guidance
3. Signpost future research

# Motivation: Empowerment measurement is difficult

- Empowerment is multi-dimensional, latent—and important!
- There are many existing metrics and more in progress
- Most widely used metrics...
  - rely on similar underlying theory (e.g. Kabeer)
  - use carefully designed surveys
  - involve intensive data collection
- At best: empowerment is challenging to measure accurately
- At worst: we are capturing the wrong things --> incorrect policies/programs --> harm
- It's a great time to take stock!

# Goals for today

- Get to the findings....while also giving you enough information about what we've done
- Hear your observations, takeaways and ideas

# Setting and data

- Samburu County, Kenya
  - Pastoralist and agro-pastoralist livelihoods
  - Below average nutritional outcomes for women and children relative to Kenya
  - Very high depression risk relative to Kenya
- Sample: 328 women
  - All have a child <5 years of age
- Survey was conducted in Feb-March 2022
  - Ongoing drought
  - In February, Samburu County was classified as a Critical Situation (IPC = 4)



# Setting and data

- We collected all inputs to the following empowerment metrics:
  - ProWEAI
  - ProWEAI Health and Nutrition Module (HN)
  - Women’s Empowerment in Livestock Index (WELI)
  - Women’s Empowerment in Nutrition Index (WENI)
  - Survey-Based Women’s Empowerment (SWPER)
- Outcomes:
  - Body Mass Index (BMI). Underweight is  $<18.5$
  - Center for Epidemiologic Studies Depression Scale (CES-D). Range is 0 to 30. High risk of clinical depression is  $\geq 10$

# Empowerment metrics, briefly

- Pro-WEAI: Project oriented version of Women's Empowerment in Agriculture Index
- WEII: Enhanced version of ProWEAI designed to capture gendered aspects of livestock keeping
- HN: Complementary module to the ProWEAI that focuses on health- and nutrition-related agency
  - Seven indicators designed to be analyzed separately, not aggregated into a single value
  - Some indicators applicable to women with children of certain ages (e.g. <2)

# Empowerment metrics, briefly

- WENI: Explicitly oriented around women's nutrition. Combines UNICEF Framework + empowerment theory.
- SWPER: Aims to be constructed with existing data (e.g. DHS) and comparable across contexts
  - Partnered women only (n = 260)
  - 3 domains analyzed separately
    - Attitudes to violence (SWPER Att)
    - Social independence (SWPER Soc)
    - Decision-making (SWPER Dec)



# Methodology

1. Descriptive comparison
  - Total survey questions
  - Survey time
  - Overlapping survey questions between metrics
2. Distributional analysis
3. Correlation analysis
  - Pearson's correlation
  - Kendall's tau rank correlation
4. Classification analysis
  - Empowerment classification alignment/misalignment
5. Predictive analysis
  - Correlation with outcomes
  - Out of sample prediction of BMI and CES-D

# 1. Descriptive comparison

Metric	Number of indicators	Number of survey questions (min, max)	Mean survey minutes (min, max)
ProWEAI	12	229 (116-167)	28 (15-77)
WELI	13	326 (119-214)	33 (15-80)
H&N	7	38 (25-38)	8 (5-18)
WENI	43	193 (105-145)	21 (11-54)
SWPER	3 domains	13 (10-13)	7 (5-18)

# 1. Descriptive comparison

Overlapping survey questions between metrics

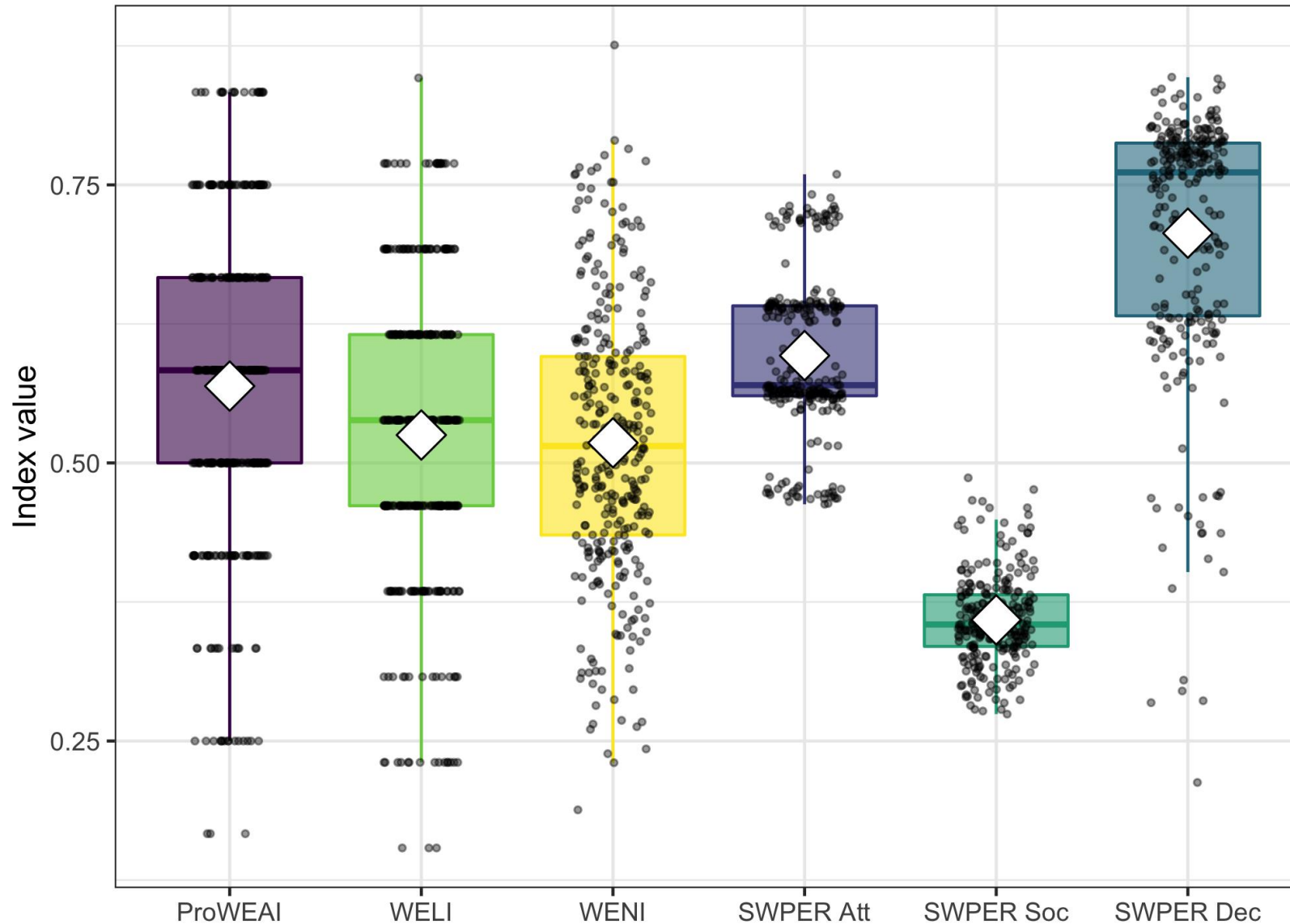
	ProWEAI	WELI	HN	WENI	SWPER
ProWEAI	100%	89%	0%	7%	44%
WELI	100%	100%	0%	7%	44%
HN	0%	0%	100%	0%	0%
WENI	12%	11%	0%	100%	11%
SWPER	9%	6%	0%	2%	100%

- 100% of ProWEAI questions are in WELI
- 89% of WELI questions are also in ProWEAI
- HN has no overlapping questions with any metrics

# 1. Descriptive comparison takeaways

1. Some metrics are more data-intensive than others. This has cost and survey burden implications for implementers and respondents.
2. Surveys appear long, but many questions were skipped in our sample.
3. Overlapping survey questions between metrics --> mechanical correlation.

## 2. Distributional analysis



Takeaways:

1. Distributions are very different!
2. pro-WEAI and WELI are very binned
3. WELI is shifted pro-WEAI distribution
4. SWPER Att and SWPER Soc have less variation



# 3. Correlation takeaways

1. Underlying theory is very similar between WENI and WEAI family, yet correlations aren't that strong
  - Operationalized differently
  - Different data aggregation approaches
  - Are we losing information somewhere?
2. Evaluate correlation in light of mechanical relationship (overlapping inputs)
  - Correlation between ProWEAI and WELI likely largely mechanical
  - ProWEAI and WENI 0.42 correlation could partly be explained by 7-12% overlap.

# 4. Classification

- Thresholds for classification as empowered vs not empowered
  - As recommended in documentation:
    - ProWEAI: 0.7
    - WELI: 0.7
    - WENI: 0.5
  - SWPER: Used threshold between “low empowerment” and “medium empowerment”
    - SWPER Att: 0.65
    - SWPER Soc: 0.36
    - SWPER Dec: 0.39
  - HN: Each indicator is already a binary variable



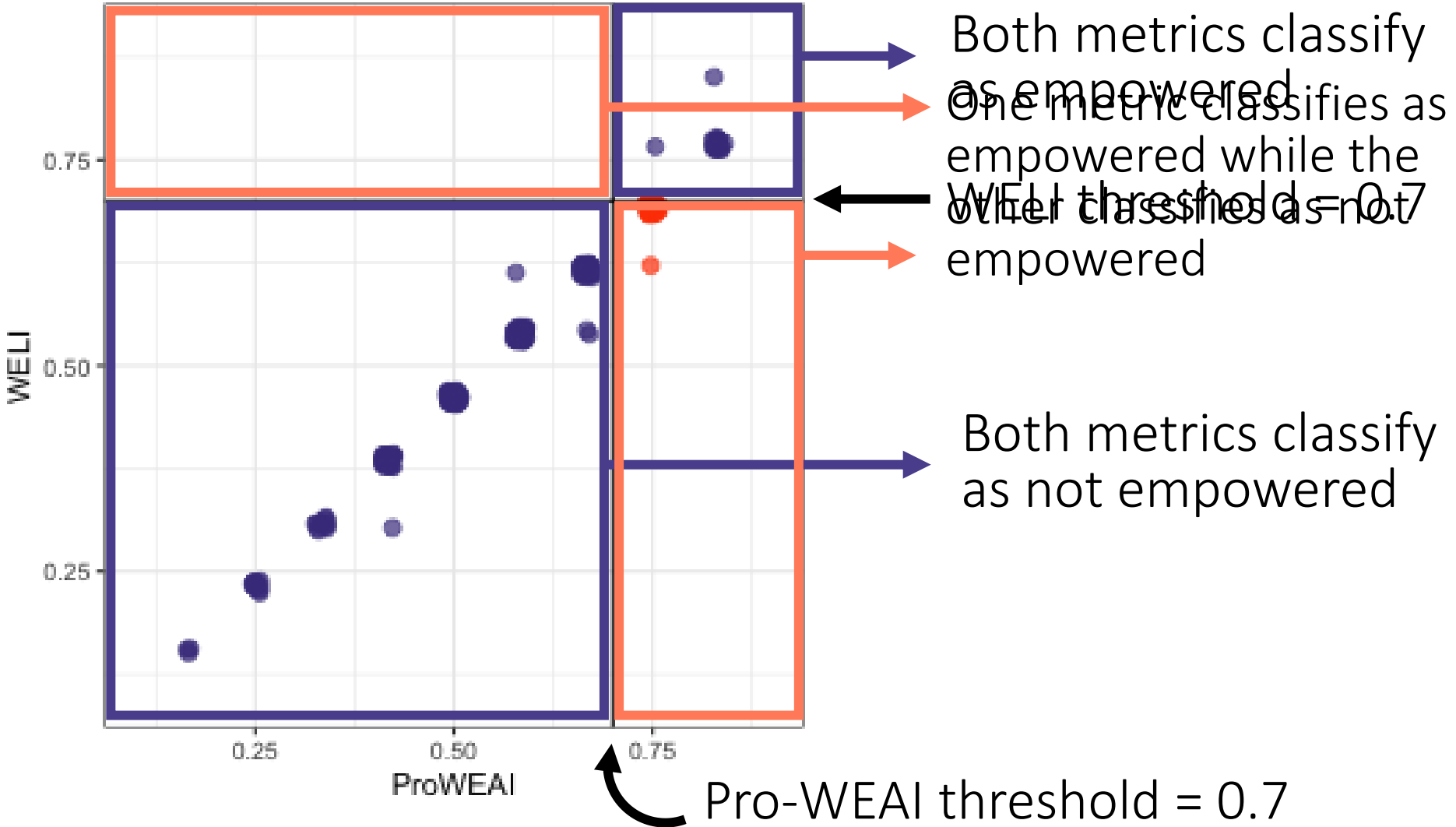
# 4. Classification

- Very different shares categorized as empowered
- Range from 6% (WELI) to 98% (SWPER Dec)

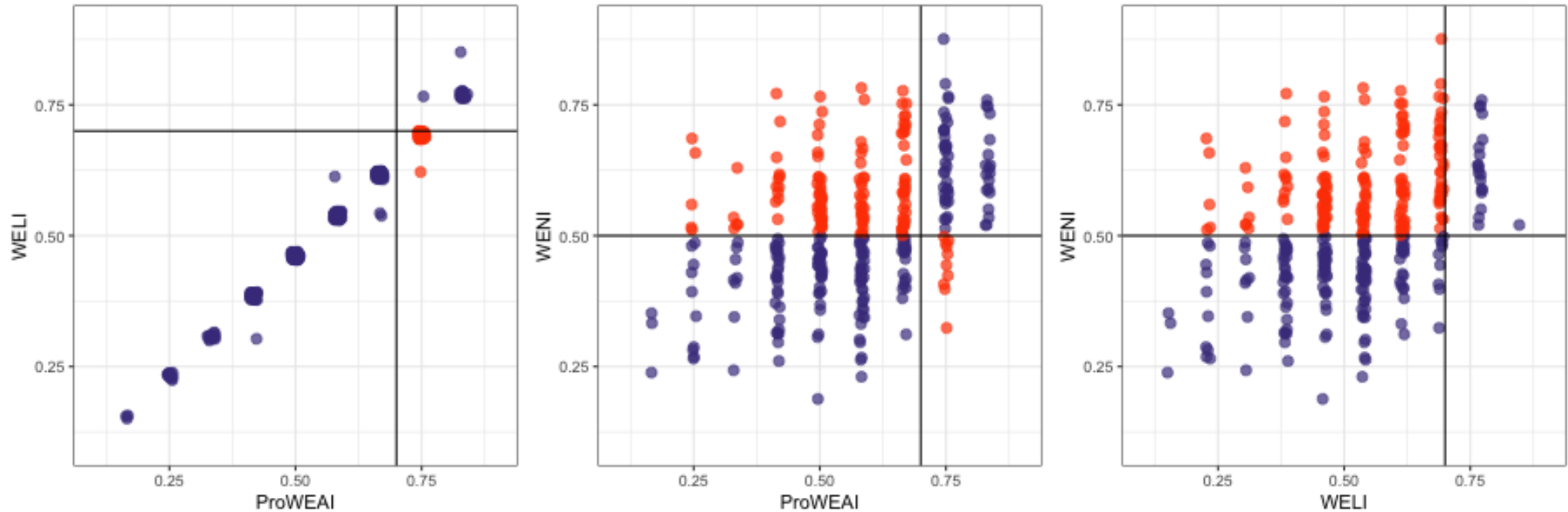
Binary status and indicators

	Mean	SD	N
pro-WEAI status	0.20	0.40	328
WELI Status	0.06	0.24	328
WENI status	0.54	0.50	328
SWPER Att status	0.15	0.35	260
SWPER Soc status	0.42	0.50	260
SWPER Dec status	0.98	0.15	260
HN decides on own health and diet	0.95	0.21	328
HN decides on own health and diet during pregnancy	0.89	0.32	237
HN decides on child diet	0.98	0.12	195
HN decides on weaning and breastfeeding	0.95	0.21	237
HN decides to seek healthcare	0.27	0.45	328
HN decides on purchase of food and health products	0.88	0.33	328
HN has access to food and health products	0.67	0.47	328

# 4. Classification

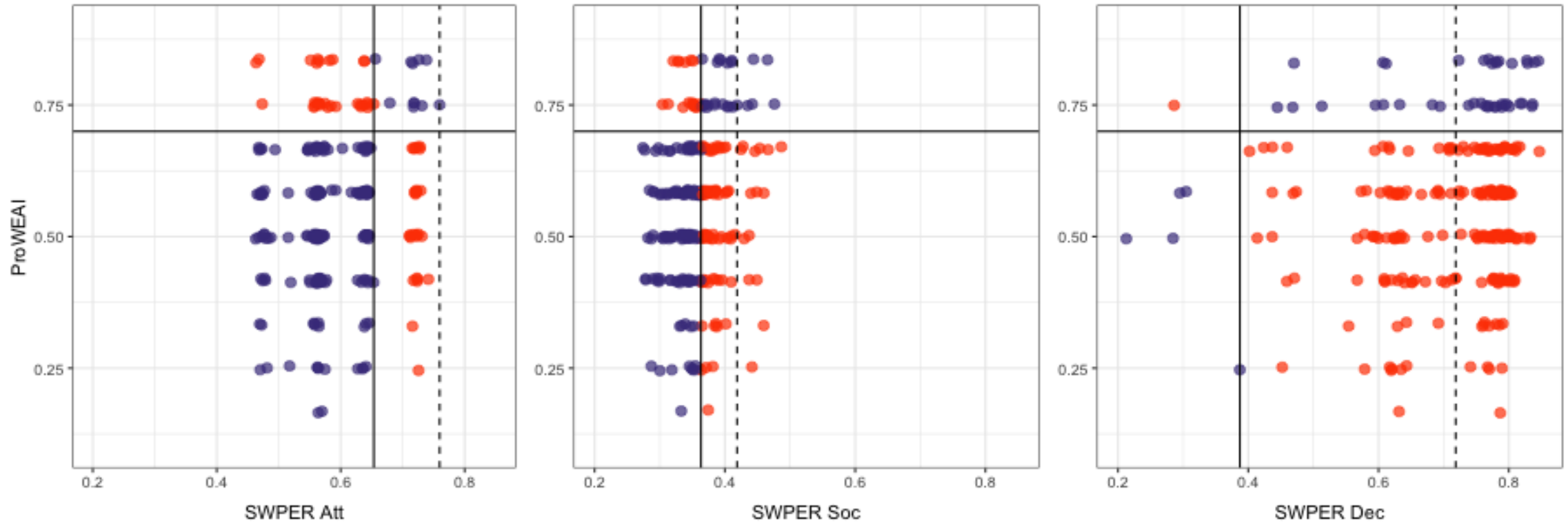


## 4. Classification: pro-WEAI, WELI, WENI



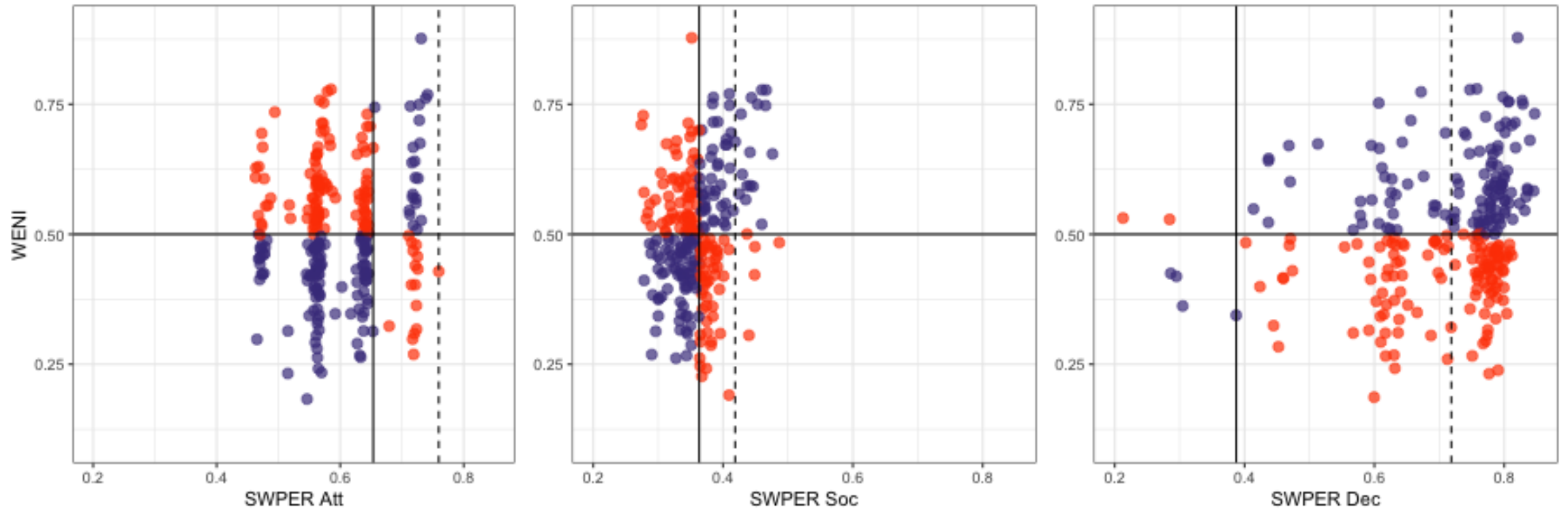
- WELI and ProWEAI are the most aligned
- Alignment between ProWEAI/WELI and WENI is not strong
- How sensitive to threshold selection is this?

## 4. Classification: pro-WEAI and SWPER



- Alignment is not strong between any pair here
- Especially poor between pro-WEAI and SWPER Dec

## 4. Classification: WENI and SWPER



- Alignment is not strong between any pair here
- Especially poor between WENI and SWPER Dec

## 4. Classification: HN and other metrics

Table A4: Pairwise empowerment classification: Share with matching status (purple)

	ProWEAI	WELI	WENI	SWPER Att	SWPER Soc	SWPER Dec
HN own health and diet	24%	11%	57%	20%	40%	93%
HN health and diet during pregnancy	30%	19%	19%	22%	46%	89%
HN child diet	17%	6%	50%	13%	42%	96%
HN weaning and breastfeeding	22%	11%	51%	18%	43%	95%
HN seek healthcare	69%	70%	54%	74%	57%	17%
HN purchase food and health products	32%	18%	60%	25%	44%	85%
HN access to food and health products	43%	35%	60%	38%	51%	65%

- High alignment between HN indicators and SWPER Dec
- Widely varying alignment with other metrics

# 4. Classification takeaways

1. Classify with caution!
2. Individual metrics' classification alignment may be sensitive to threshold  
...however, poor classification alignment does not appear to be threshold-driven overall
3. Poor classification alignment is related to weak pairwise pearson correlation and rank correlation

# 5. Predictive analysis: Empowerment, nutrition and mental health

- Large body of work looking at empowerment and nutrition
  - Focus on children, but also women
  - Evidence on the relationship is mixed
  - Complex causal chain
- Accelerating interest in mental health outcomes more generally
  - Global prevalence of depression: 4.3% in 2015
  - One of top causes of disability in every SSA country
  - #1 cause in six SSA countries
- Existing body of work on empowerment and mental health is small, but growing
- Increasingly flagged as a priority area



# 5. Predictive analysis: Summary statistics

Outcome variables						
	Median	Mean	SD	Min	Max	N
BMI	18.31	19.04	3.38	13.66	40.15	328
Severe thinness	0.00	0.12	0.32	0.00	1.00	328
Moderate thinness	0.00	0.16	0.37	0.00	1.00	328
Mild thinness	0.00	0.25	0.43	0.00	1.00	328
Normal range	0.00	0.41	0.49	0.00	1.00	328
Pre-obese	0.00	0.04	0.20	0.00	1.00	328
Obese	0.00	0.01	0.11	0.00	1.00	328
Center for Epidemiologic Studies Depression Scale	7.00	8.26	4.97	0.00	23.00	328
CES-D low risk of depression	1.00	0.71	0.45	0.00	1.00	328
CES-D high risk of depression	0.00	0.27	0.45	0.00	1.00	328

- BMI: 53% of women below normal BMI range (<18.5)
- CES-D: 27% of women at high or very high risk of depression

# 5. Predictive analysis: Correlation with BMI

Table 4: Correlation between empowerment metrics and outcomes (Pearson)

Continuous Scores							
	CESD	pro-WEAI	WELI	WENI	SWPER Att	SWPER Soc	SWPER Dec
BMI	0.003	0.125*	0.131*	0.259***	0.033	0.03	0.081

HN Indicators							
	HN own health and diet	HN health and diet during pregnancy	HN child diet	HN weaning and breastfeeding	HN seek healthcare	HN purchase food and health products	HN access to food and health products
BMI	-0.017	0.03	0.049	-0.039	-0.02	0.063	0.144**

# 5. Predictive analysis: Correlation with CES-D

Table 4: Correlation between empowerment metrics and outcomes (Pearson)

Continuous Scores							
	CESD	pro-WEAI	WELI	WENI	SWPER Att	SWPER Soc	SWPER Dec
CESD	-	0.068	0.073	0.164**	0.064	-0.035	-0.062
HN Indicators							
	HN own health and diet	HN health and diet during pregnancy	HN child diet	HN weaning and breastfeeding	HN seek healthcare	HN purchase food and health products	HN access to food and health products
CESD	-0.048	-0.186**	0.008	-0.046	0.096*	-0.007	-0.075

# 5. Predictive analysis

1. Linear regression model using random 75% of data

$$Y_i = \alpha + \beta E_i + \gamma X_i + \varepsilon$$

↑                      ↑                      ↙  
CES-D or BMI      Empowerment metric      Age and age<sup>2</sup>

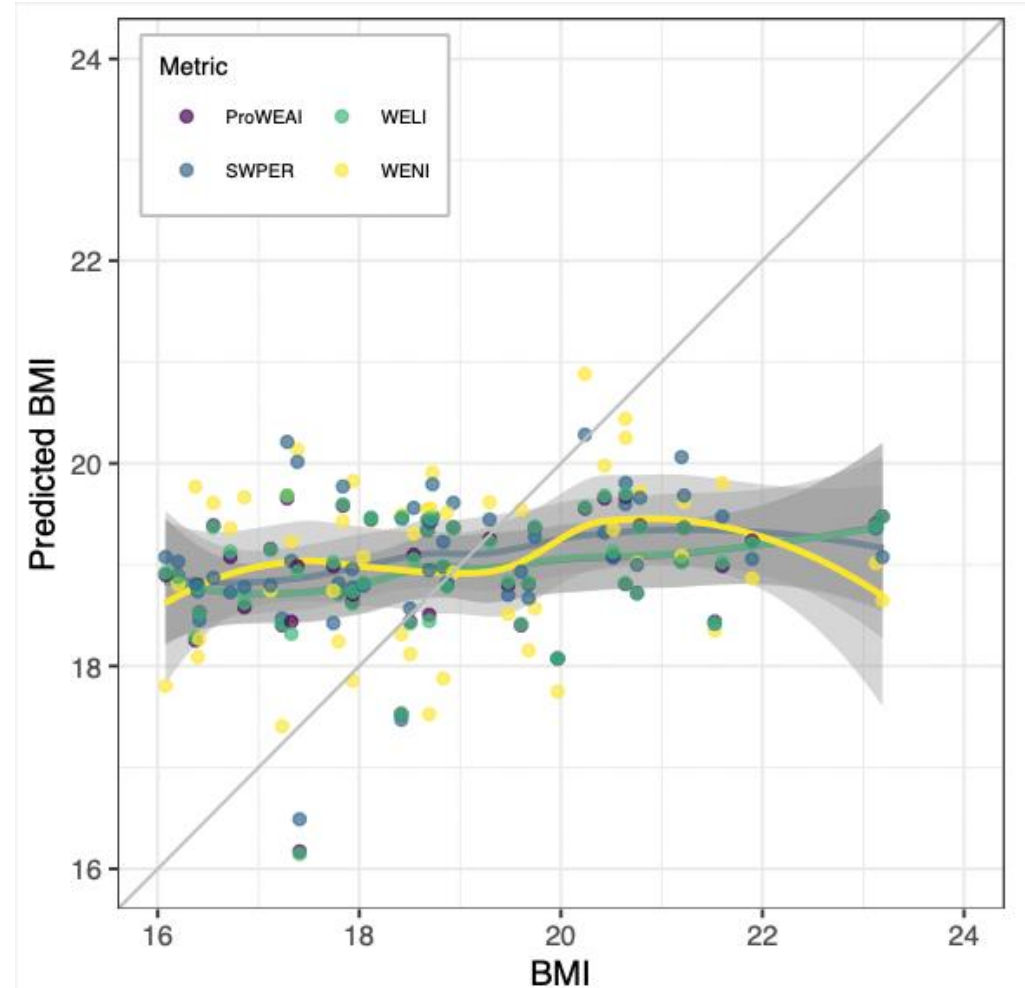
ProWEAI, WELI, WENI--continuous empowerment scores  
SWPER: Contains all three domains  
HN: Excluded from this analysis

These steps are repeated  
50x for each model

2. Predict outcome in remaining 25% of data
3. Evaluate performance of prediction using RMSE and R<sup>2</sup>

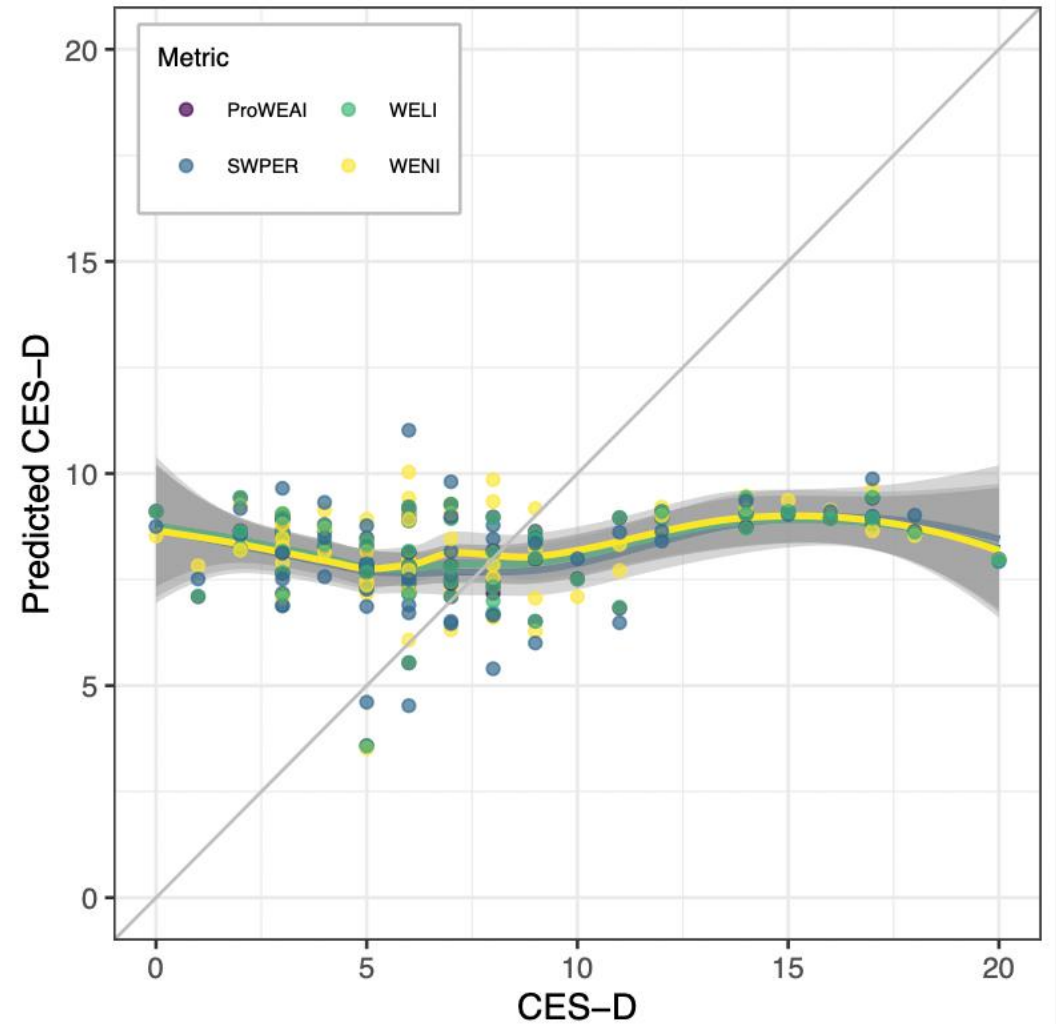
# 5. Predictive analysis: BMI

- RMSE: no meaningful difference
- $R^2$ :
  - 0.088 for WENI
  - 0.038 for ProWEAI
  - Smaller for others
- No visual distinction in predictive capacity of different metrics



# 5. Predictive analysis: CES-D

- RMSE: no meaningful difference
- $R^2$ :
  - 0.06 for WENI
  - 0.054 for ProWEAI
  - Smaller for others
- No visual distinction in predictive capacity of different metrics



# 5. Predictive analysis takeaways

1. Simple correlation with outcomes is variable
  - SWPER not correlated with any outcomes
  - Many HN indicators not correlated with either outcome
  - WENI correlated with both outcomes
  - pro-WEAI/WELI correlated with BMI only
2. ProWEAI and WENI consistently explain more variation in BMI and CES-D
  - WENI's emphasis on women's health and nutrition may explain better predictive power for both CES-D and BMI
3. No meaningful differences in RMSE for any metric/outcome
4. All of this may be underpowered and/or due to context-specific factors

# Conclusions and further questions

1. These metrics are quite different, despite shared theoretical basis
  - Differences do not strongly correspond to different foci or purposes of metrics
  - Metrics do not appear substitutable for one another
  - No “one metric to rule them all”
2. Do livelihood or outcome-oriented metrics add value?
  - Findings are mixed
  - WELI does not appear to add value in this context, despite livestock focus
  - WENI’s focus on health and nutrition appears to yield higher correlation with outcomes
  - Only one HN indicator correlated with BMI
3. Your ideas??



# Future work

1. How do aggregation approaches drive the differences in these metrics?
  - pro-WEAI, WELI: Very rich data collected, but yield functionally categorical variables. Are we losing important information?
  - WENI: Information loss due to aggregation?
2. Index vs. dashboard of indicators:
  - Index: very user-friendly but possibly imprecise
  - Dashboard: more challenging to implement and interpret, but gives a fuller picture
  - Perception challenges associated with using multiple information points: potential for perceived cherry-picking, bias, etc.
3. Are these findings unique to Samburu?
  - Other evidence coming soon! (e.g. India)
4. Your ideas?

# THANK YOU!!!

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