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The Power and Pitfalls of Asset-based Wealth Indices

Applications for health and social science

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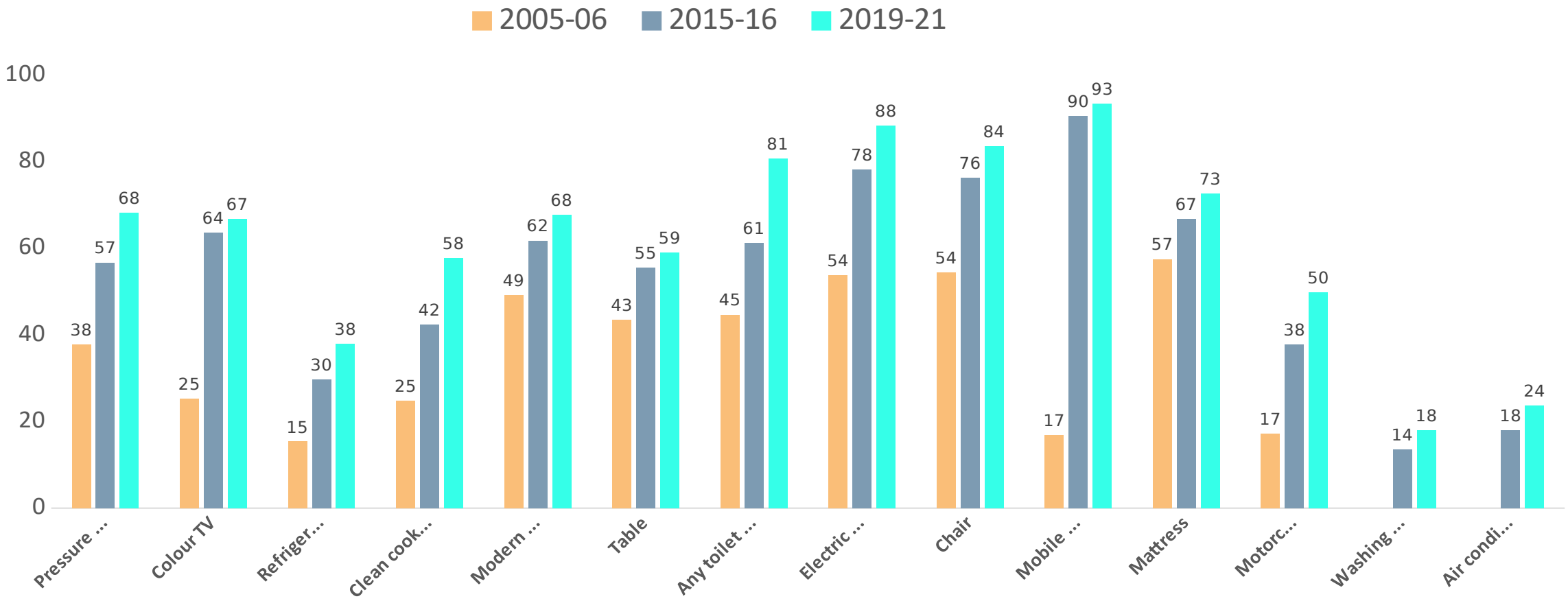
Background

Wealth index is a proxy measure for household economic status.

It helps explain

- Variation in outcomes
- Inequities in health outcomes
- Socio-economic inequality or poverty

Wealth index created by principal component analysis (PCA) (Filmer and Pritchett, 2001) - Cited over 7000 times



The problem: *Relative vs Absolute poverty*

- Commonly used as an **Ordinal measure** to estimate wealth-based inequities for the outcomes (Howe et al., 2008).
- Cross-sectional wealth indices **ignore changes in group composition** when defining poor and non-poor and are **used longitudinally** to do research on wealth effects and inequality (*J D Barros et al., 2012).*

Objective

- To compare wealth index (PCA) constructed using pooled vs cross-sectional data.
- To construct a parsimonious alternative to wealth index that performs equally well or better.

Data

India's National Family Health Survey data (Demographic Health Survey)

Wave 3 - 2005-06: N=109,041

Wave 4 - 2015-16: N=601,509

Wave 5 - 2019-21: N=636,699

Methodology

1. Screening assets and amenities.
2. Constructing wealth index by 4 methods:
   - Principal Component Analysis (PCA) using cross-sectional data.
   - PCA using pooled data.
   - Top 10 assets using cross-sectional data.
   - Top 10 assets using pooled data.

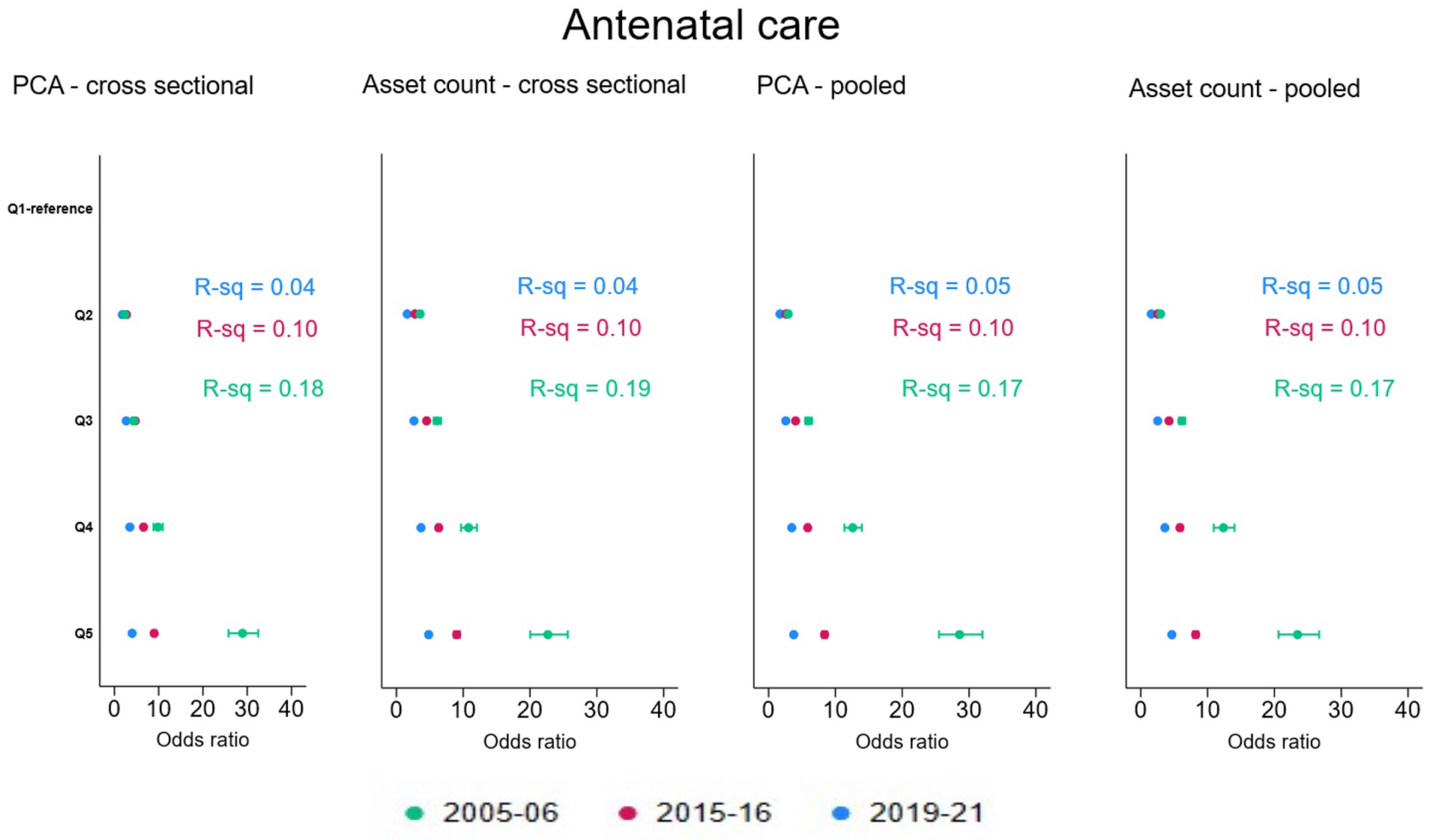
Evaluating performance

- Capturing variation and wealth gradients.
- Examining absolute asset poverty.
- Examining wealth inequality.
- Examining inequity in outcomes.

Screening- Ten assets based on the highest eigenvalues over time

Variable	PCA – cross-sectional			PCA – pooled
	2005-06	2015-16	2019-21	2005-2021
Pressure cooker	0.26	0.26	0.26	0.28
Color TV	0.26	0.25	0.26	0.28
Refrigerator	0.24	0.26	0.28	0.27
Clean cooking fuel	0.26	0.25	0.23	0.26
Modern house	0.23	0.24	0.24	0.26
Table	0.24	0.23	0.23	0.25
No toilet facility	|-0.23|	|-0.23|		|-0.24|
Electric fan	0.23	0.21		0.23
Chair	0.23			0.23
Mobile Phone	0.23			
Mattress		0.21	0.21	0.23
Washing Machine		0.22	0.24	
Air conditioner			0.22	
Motorcycle			0.21	

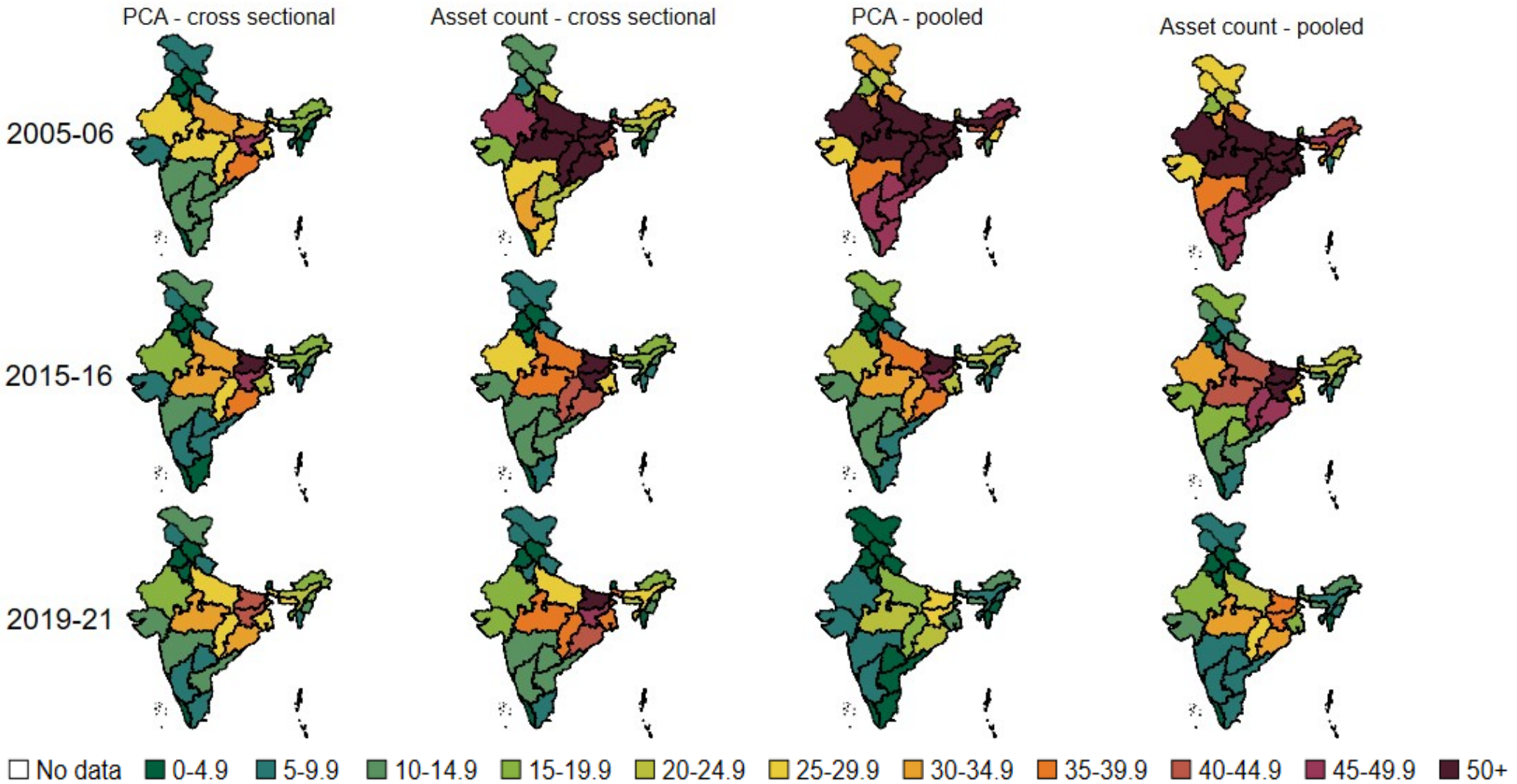
“Construct performance”: does an asset count perform as well as a standard DHS wealth index or quintile set in explaining different outcomes? - Yes



Examining asset poverty

- Focus on the lowest wealth quintile (20 % poorest).

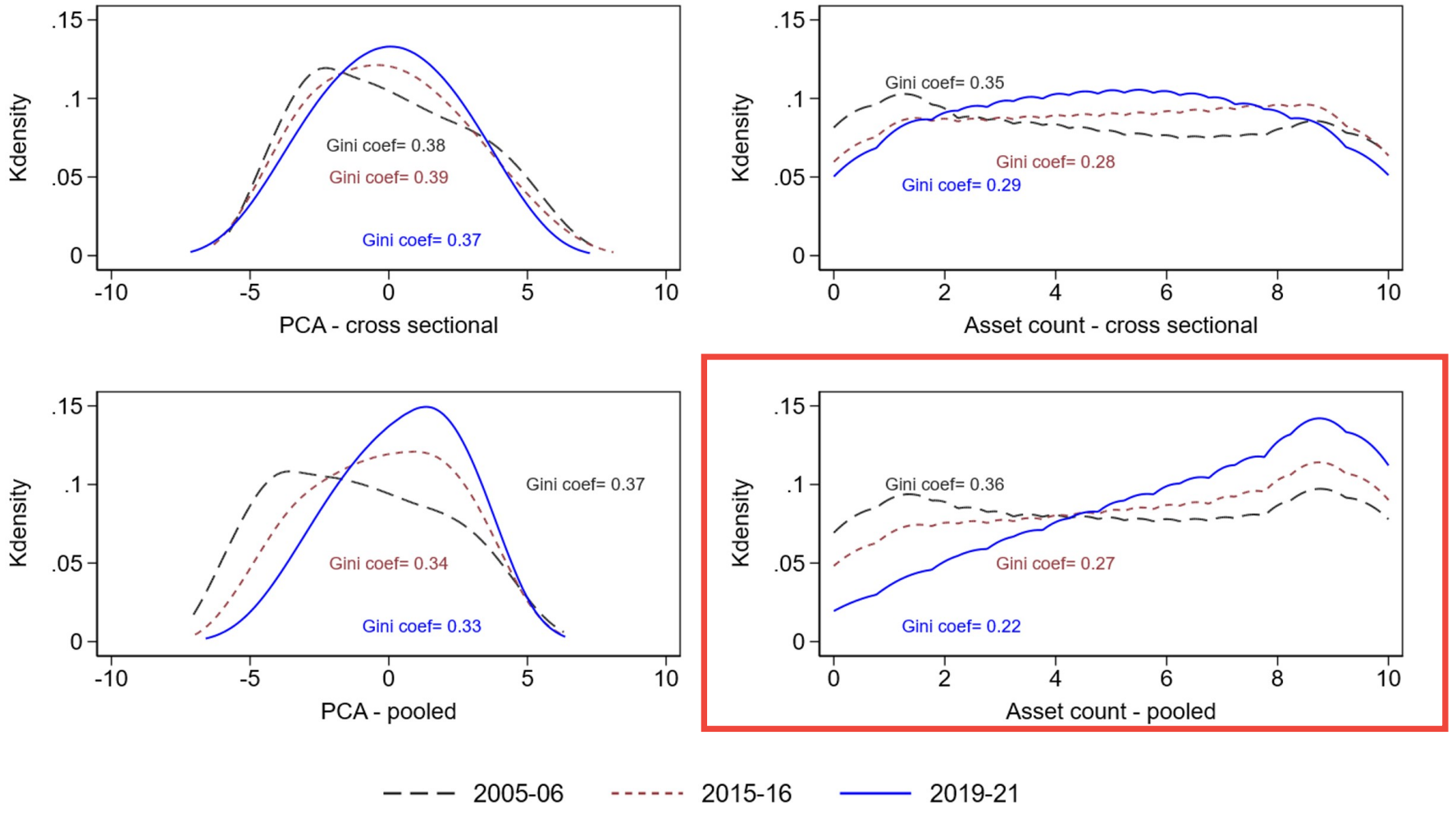
Assets counts & PCA - pooled capture changes in absolute poverty



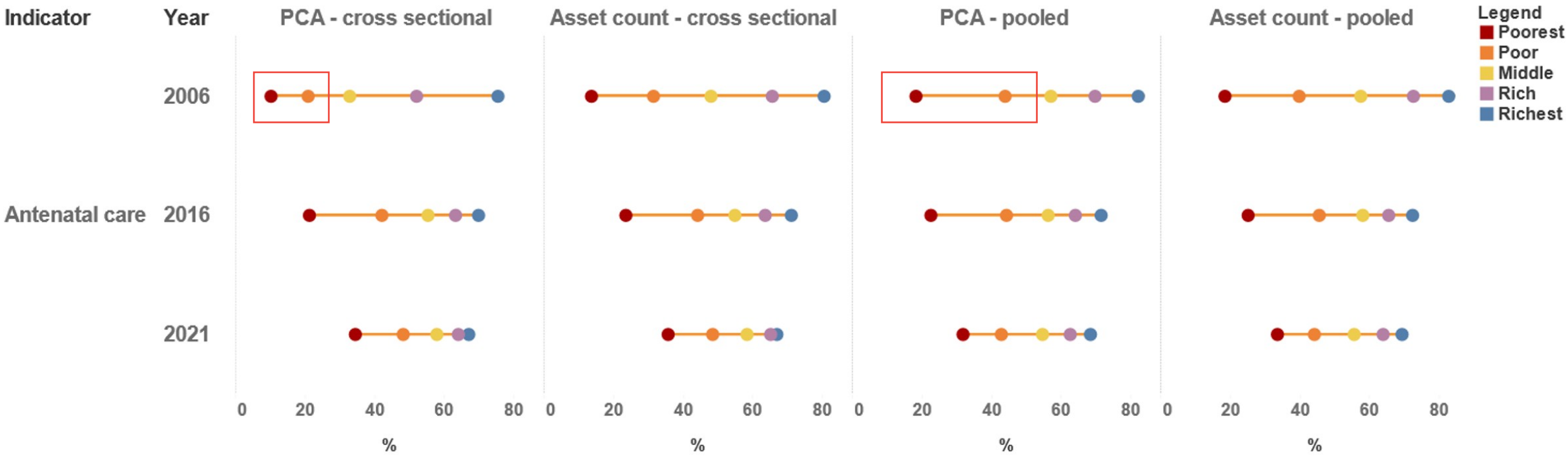
Examine wealth inequality

- To observe changes in inequality we plot the wealth score curves and calculate the Gini coefficient.

Asset count - pooled shows declining inequality over time, with the Gini coefficient diminishing from 0.36 (2005-06) to 0.22 (2019-21)



Poor vs non-poor gap in the coverage of health interventions



Recommendations for researchers

Objective	Method used
Control for wealth effects longitudinally	Pooled PCA method
Estimate asset-based wealth inequality and absolute asset poverty	Pooled asset count index
Estimate changes in inequities in health coverage	Pooled PCA or pooled asset count

Thank you