Measuring Service Delivery

ASSAf Workshop on “Measuring Deprivation in order to promote Human Development in South Africa”, 9-10 June 2015

Morné Oosthuizen
Development Policy Research Unit, UCT

Overview

- Why asset measures?
- Data on service delivery
- How has public asset poverty changed in SA?
- Conclusion

Why asset measures?

- View that money-metric measures (income, expenditure, consumption) do not and can not tell us the full story

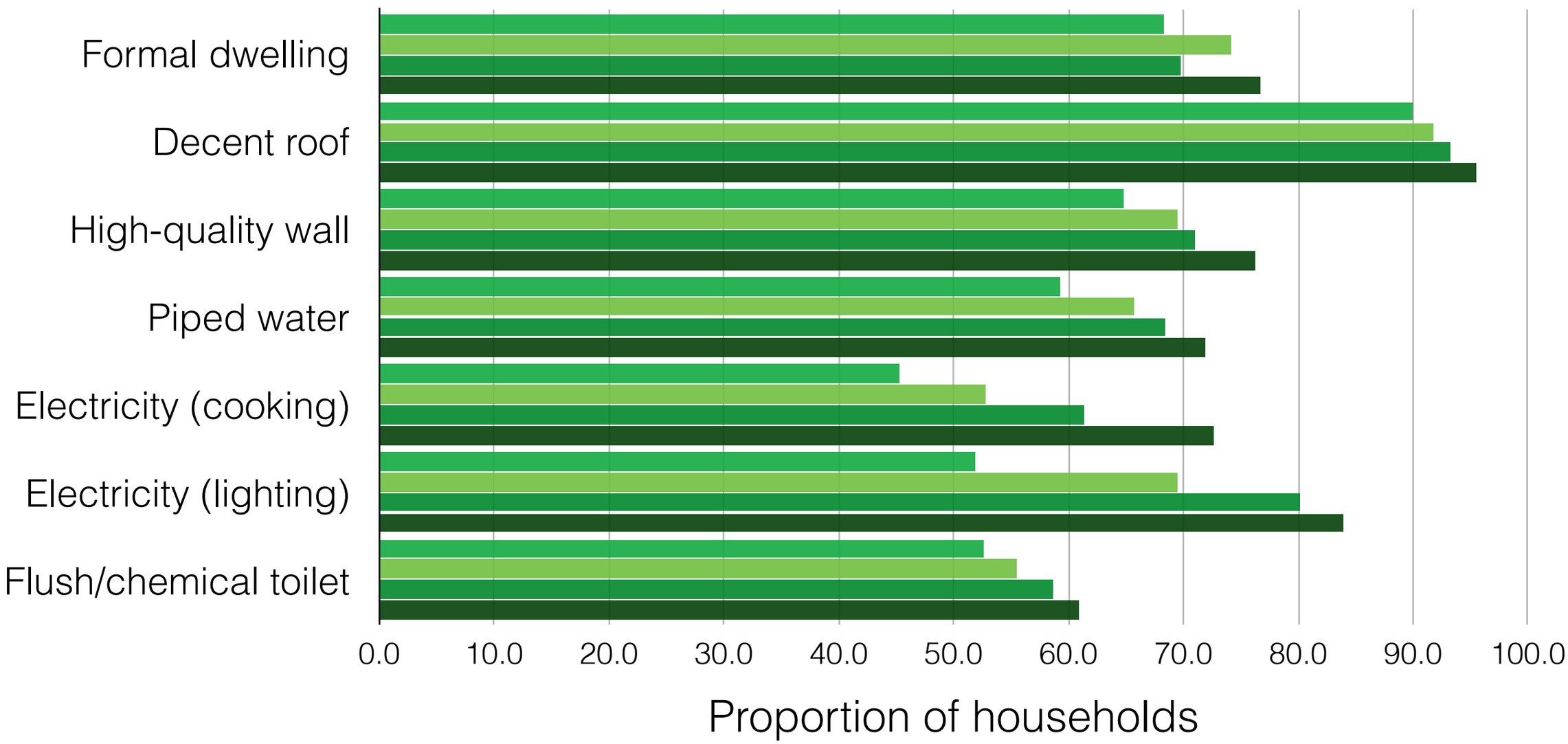
- Government poverty alleviation policy may promote asset accumulation or may deliver in-kind benefits rather than trying to directly address income

- In-kind benefits may include housing, connections to electricity/water, free allocations, municipal services

Data on service delivery

- In SA, increased effort dedicated to collecting data related to service delivery (“public assets”) at a nationally representative level
    - Dedicated surveys rather than peripheral modules
    - More detailed questions
    - Probing new aspects (e.g. disconnections)
- Some data constraints for time comparisons, worse the further back one goes

Household access to public assets, 1993-2011



Challenge with non-money metric measurement

- National household survey data allows us to discern levels of access to a particular service by covariate of interest
- But these separate measures of deprivation are not easily summarised in a single statistic
- Question of relative weighting of separate measures
  - One option is factor analysis (weights determined from the data)

Factor analysis

Household's ownership of asset linearly linked to common factor (household welfare)

$$a_{ik} = \beta_k c_i + u_{ik}$$

But independent variable and its coefficient are unobservable

Factor analysis allows direct estimation of the relationship, allowing construction of appropriate weights for the index

$$c_i = f_1 a_{11} + f_2 a_{22} + \ldots\ldots + f_k a_{ik}$$

How has public asset poverty changed in SA?*

- 1993 to 2011:
  - PSLSD 1993; OHS 1999; GHS 2005; GHS 2011 (pooled)
- Choice of public assets aligned to four key areas of service delivery:
  - Housing; Energy; Water; Sanitation

* Based on Bhorat, Van der Westhuizen & Yu (2014)

Defining assets/services

Service/ Asset	'Aspect'	Variables
Housing	• Dwelling type	Formal; Informal; Traditional
	• Roof material	Bricks; Tile; Asbestos; Thatch; Corrugated iron/ zinc; Inferior quality
	• Wall material	High quality; Medium quality; Low quality
Energy	• Source for cooking	Electricity; Paraffin/coal; Wood dung; Gas/solar
	• Source for lighting	Electricity; Candles; Paraffin; Other inferior sources
Water	• Water source	Piped water; Public tap; Borehole; Surface water
Sanitation	• Toilet type	Flush/chemical; Pit latrine without ventilation; Pit latrine with ventilation; Bucket latrine; None

Defining assets/services in the surveys

- Dwelling types
  - Formal dwelling
  - Informal dwelling ★
  - Traditional dwelling T

3.1	Indicate the type of main dwelling and other dwelling that the household occupies?	Main dwelling
	01 = Dwelling/house or brick/concrete block structure on a separate stand or yard or on farm	
T	02 = Traditional dwelling/hut/structure made of traditional materials	
	03 = Flat or apartment in a block of flats	
	04 = Cluster house in complex	
	05 = Town house (semi-detached house in complex)	
	06 = Semi-Detached house	
	07 = Dwelling/house/flat/room in backyard	
★	08 = Informal dwelling/shack in backyard	
★	09 = Informal dwelling/shack not in backyard, e.g. in an informal/squatter settlement or on farm	
	10 = Room/flatlet on a property or a larger dwelling/servants' quarters/granny flat	
★	11 = Caravan/tent	
	12 = Other (specify)	

Defining assets/services in the surveys

- “Inferior” roof materials
  - Wood, plastic, cardboard, mud and cement mix, wattle and daub, mud
- “High” quality walls
  - Bricks, cement block/concrete
- “Medium” quality walls
  - Mud and cement mix, wattle and daub, mud
- “Low” quality walls
  - Corrugated iron/zinc; wood; plastic; cardboard; tile; thatching/grass; asbestos

5.2	What is the main material used for the walls and the roof of the main dwelling?	Walls	Roof
	01 = Bricks		
	02 = Cement block/concrete		
	03 = Corrugated iron/zinc		
	04 = Wood		
	05 = Plastic		
	06 = Cardboard		
	07 = Mud and cement mix		
	08 = Wattle and daub		
	09 = Tile		
	10 = Mud		
	11 = Thatching/grass		
	12 = Asbestos		
	13 = Other (specify)		

Index weights (scoring coefficients)

Dwelling: Formal	0.6286
Dwelling: Informal	-0.3369
Roof material: Bricks	0.0980
Roof material: Tile	0.4074
Roof material: Asbestos	0.2439
Roof material: Thatch	-0.3422
Roof material: Inferior quality	-0.0727
Wall material: High quality	0.6577
Wall material: Low quality	-0.3183
Water source: Piped water	0.7362
Water source: Borehole	-0.2039
Water source: Surface water	-0.4434
Energy source for cooking: Electricity	0.8205
Energy source for cooking: Paraffin/Coal	-0.4430
Energy source for cooking: Wood/Dung	-0.5650
Energy source for lighting: Electricity	0.7893
Energy source for lighting: Candles	-0.6600
Energy source for lighting: Other inferior sources	-0.0637
Sanitation: Flush/Chemical toilet	0.7339
Sanitation: Pit latrine without ventilation	-0.4571
Sanitation: Bucket latrine	-0.1305
Sanitation: None	-0.4083

Source: Own calculations using PSLSD 1993, OHS 1999, GHS 2005 and GHS 2011 data.

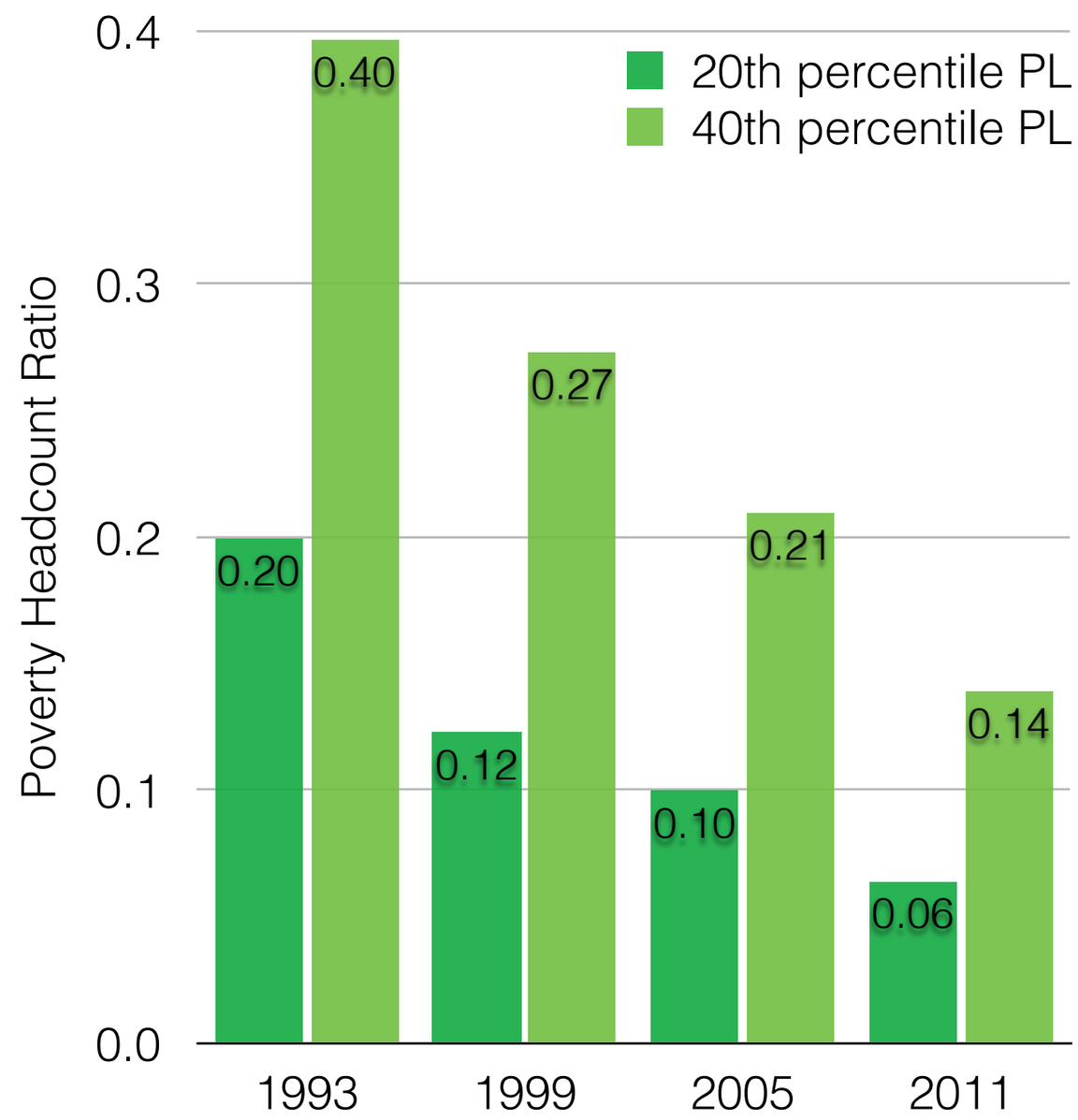
How has public asset poverty changed in SA?

- Mean public asset index
  - Improvement in mean index over time
  - Preliminary evidence of decline in deprivation
  - Non-linearity in service delivery improvement

	Mean	Change
1993	-0.2993	
1999	-0.0905	+0.2088
2005	0.0368	+0.1273
2011	0.2068	+0.1700

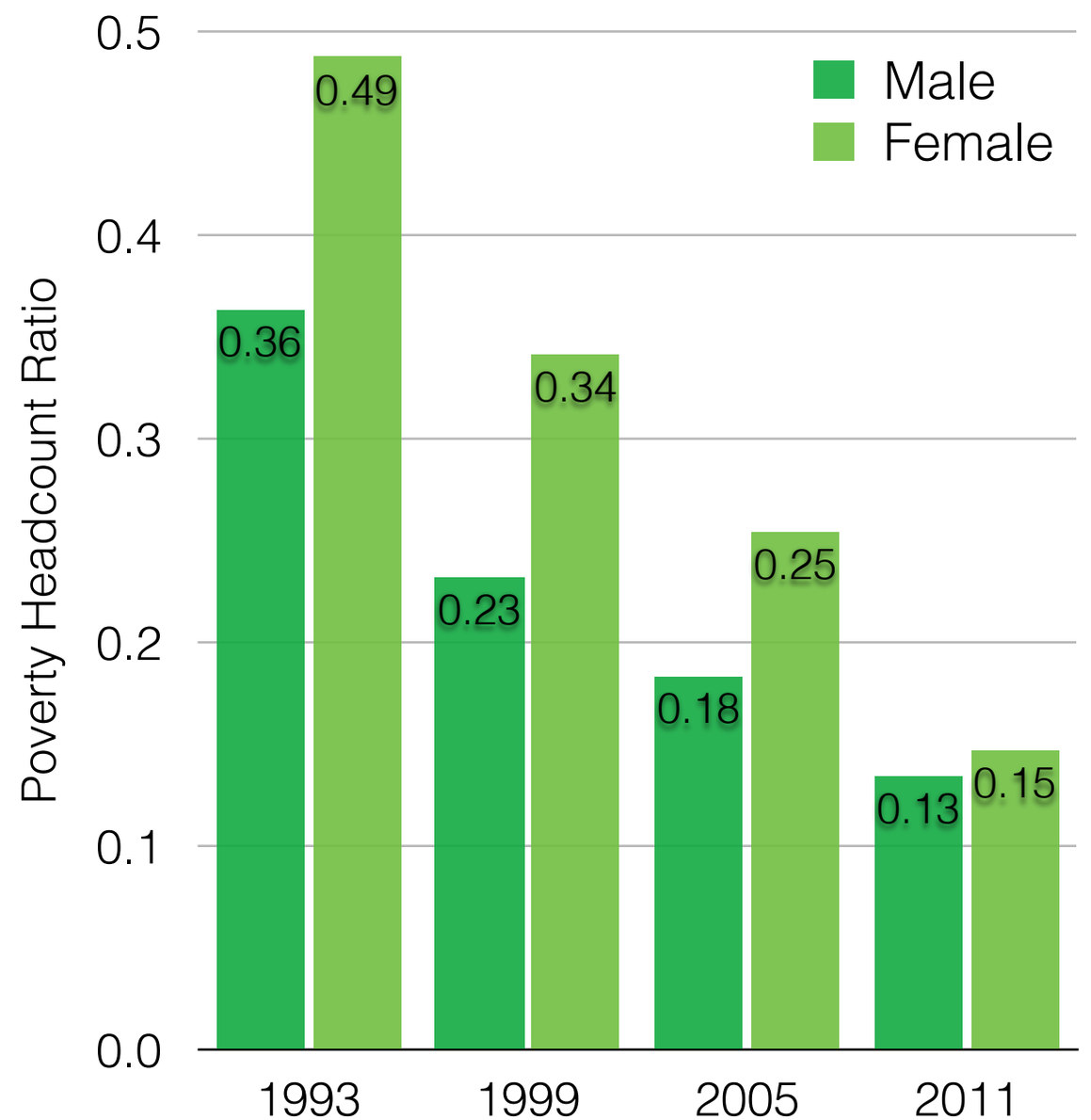
How has public asset poverty changed in SA?

- Choose two poverty lines
  - Defined relatively for 1993
  - Applied absolutely thereafter
- Decline in poverty rates between consecutive periods (statistically significant)



How has public asset poverty changed in SA?

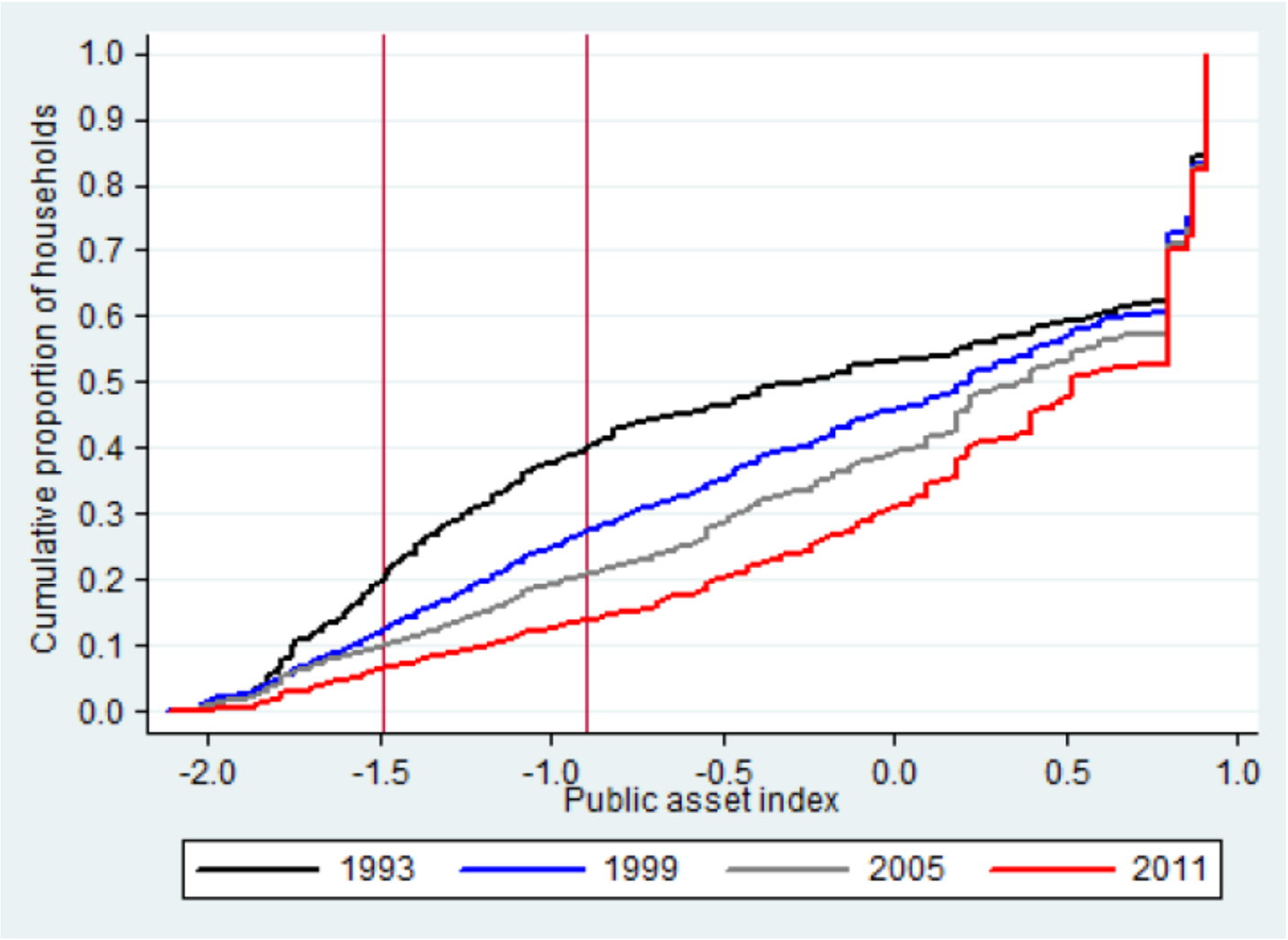
- By gender of head:
  - Decline in headcount
  - Narrowing of gap (vs. widening i.t.o. income)
- By race of head:
  - Declines generally consistent (very few poor White/Asian households)



* 40th percentile PL

How has public asset poverty changed in SA?

- Cumulative density functions
  - Cumulative proportion of households below a certain index level
  - Irrespective of chosen poverty line over a broad range of values, improvement over time



Conclusion

- Asset poverty—as measured by headcount ratio—has shown continuous decline over the period
- Non-linearity in the decline: the 1993-1999 period saw more rapid improvement
- Particular improvements for African- and female-headed households, and those in FS and LP
    - Improvement for female-headed households means they are not particularly disadvantaged