INA, Port Moresby
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Two Decades of Poverty in Papua New Guinea

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Motivation

- Little is known about poverty trends in PNG
  - Despite priority placed on poverty by the main donors to PNG
- PNG is a laggard in household surveying
  - few countries remain with just two national household surveys that can be used for poverty measurement
  - 14 year gap between these surveys also reduces usefulness
  - Compare with biennial estimates in Vietnam, triennial estimates in Indonesia/Cambodia, even SoIs have just a 5-year survey gap
- Existing evidence already places PNG amongst the highest poverty rate countries in East Asia and the Pacific
  - Social indicators more similar to Africa than to the surrounding region
  - Limited domestic constituency for action on poverty, low statistical capability, and indifference to statistics from policy makers

Baseline: 1996 PNG Household Survey

- Sample of 800 households in 73 rural Census Units, 240 households in NCD and 100 in other urban areas
  - Survey measured consumption, not cash incomes
    - Using 2-week closed interval recall
  - Consumption estimates include self-produced items, gifts, changes in food stocks, estimated value of services from durables
    - Adjust for household composition using adult-equivalent scale, 0-6 years = 0.5, else 1.0.
- Cost-of-Basic-Needs poverty line (cost of 2200 calories per adult equivalent per day) + non-food
  - National poverty rate of 37% (highest in rural Momase)

The NCD food poverty line basket

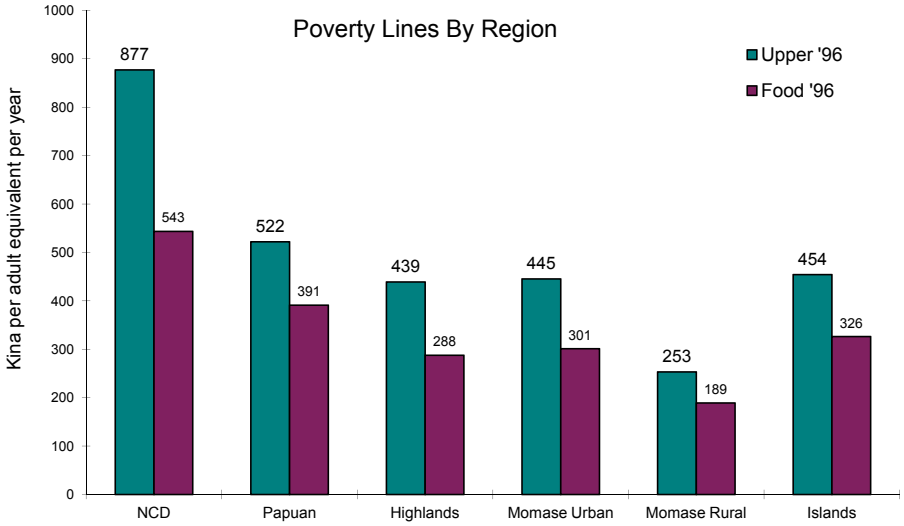
Food	gram/day			gram/day
Rice	257		Other meat (& bush meat)	32
Cassava	105		Lamb and Mutton	30
Banana	89		Fish	25
Coconut	66		Tinned fish	25
Flour	63		Tinned meat	19
Sweet potato	38		Chicken	15
Sugar	27		Aibika	11
Bread	15		Other fresh fruit	21
Potato	10		Greens, vegetables, nuts	20
Biscuits	8		Soft drink	29
Sago	7		Meals out of home (Kcal)	23

Half daily calories from cheapest staple – rice in NCD, Kaukau in Highlands (1400 grams per day) – very small allowance of protein and fats

- Single national basket would be 10% costlier

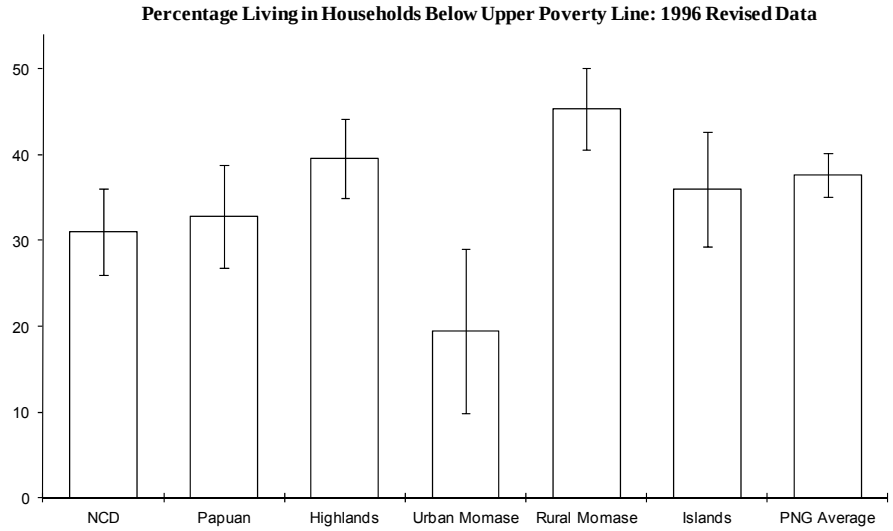
1996 Poverty Lines

(upper line averaged K460 (USD $350)/adult equivalent/year)

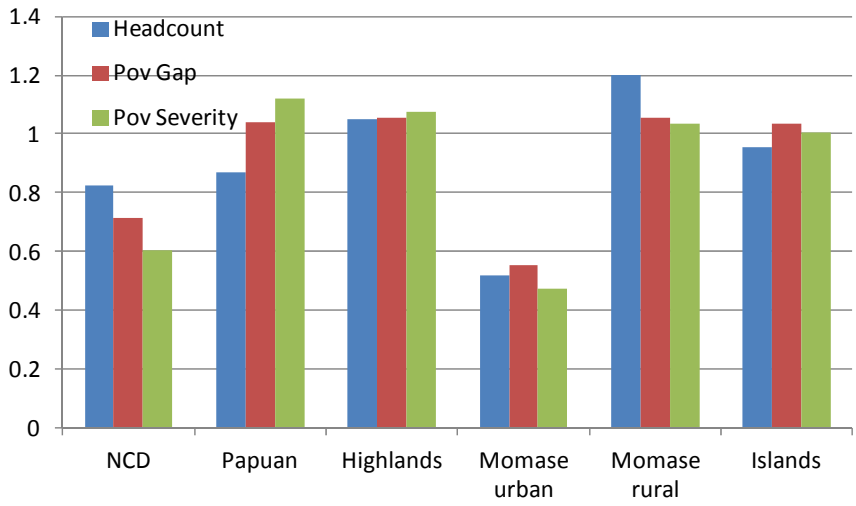


Headcount Poverty Rate of 37.5% in 1996

(ca. one-half of this was chronic, one-half was transient)

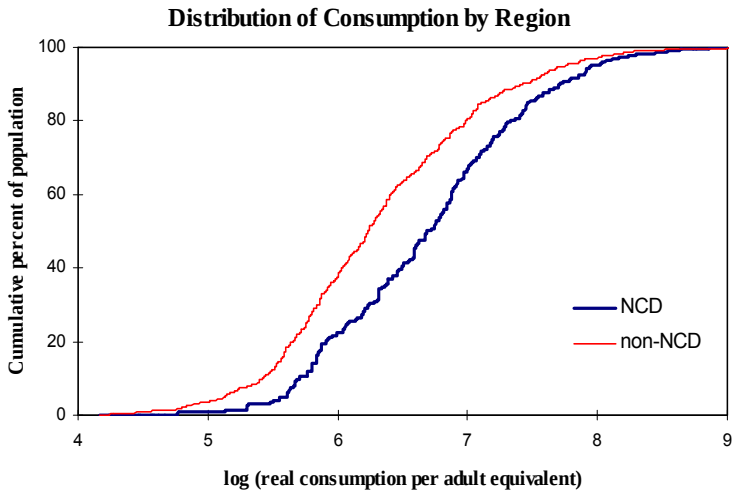


Relative Rates ('risk') in 1996
(adjusted to comparability with 2010)



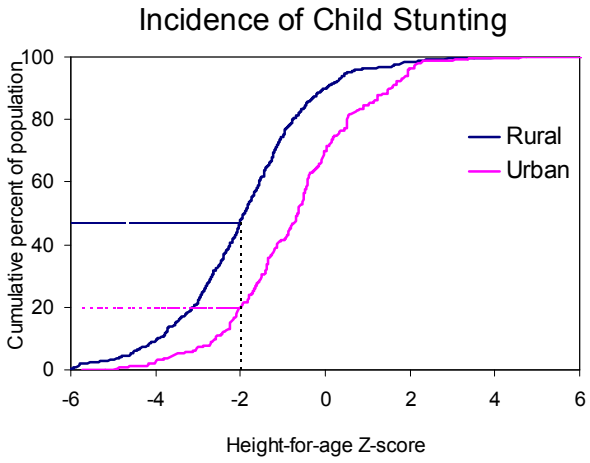
NCD: low risk, even lower as consider distribution-sensitive measures
Rural Momase: high risk of being poor, but depth/severity are average

Lower poverty rate in NCD was robust to choice of poverty line



Non-monetary indicators showed the same patterns

- E.g. incidence of stunting was much higher in rural areas, regardless of threshold used
- Why?
- Access to health, energy-dense diet, higher incomes and higher women's education



2009/10 Household Income and Expenditure Survey (HIES)

- Sampling differences

  More than three times larger (n=4080)
  - Almost half the sample in urban areas, since CPI updating was a major objective of the survey
  - more heavily clustered (18 households per rural CU vs 12 in 1996)
    - ➔sampling errors not 3 times smaller
  - Does allow disaggregation of urban and rural sectors for Momase
    - 600 urban households surveyed in Momase, similar to sample size for NCD, compared with only 200 urban households in each of Highlands, Islands and Southern Regions

The final HIES sample

Stratum	# PSUs	Pop Est HH	Sample HH	Weight
Pt Moresby	107	41546	622	66.79
Southern Urban	13	11833	232	51.00
Southern Rural	23	127416	399	319.34
Momase Metro	25	12322	173	71.23
Momase Urban	25	24762	425	58.26
Momase Rural	32	228613	565	404.62
Highlands Urban	12	15884	211	75.28
Highlands Rural	47	395482	841	470.25
Islands Urban	12	9775	210	46.55
Islands Rural	23	125685	403	311.87
TOTAL	319	993318	4081	

NB: Count of 4081 households is those with any part of the survey completed. Only 3,800 started an expenditure diary and only 3,660 have a complete diary

Similar features of the two surveys

- Questionnaires organised by means of acquisition
  - ➔Consumption is a residual

    Purchases
    + Own-production
    + Gifts received
    - Sales
    - Gifts given
    - Stock increases
    = Consumption.
- Attempt to measure starting and ending stocks of major foods to remove one wedge between expenditure and consumption
  - Not a feature of similar surveys elsewhere
- Non-frequent items based on annual recall

12

Food stocks measurement

- closed interval (two-visit) consumption recall in 1996 enabled measuring start and end food stocks
  - Largest stocks for root crops and plantains
    - Average 9 kg amongst stockholders, maximum 90kg
      - Max could feed family for 20 days, so non-seasonal stocking
  - Rice had largest stocks of store-bought foods
    - Ignoring just rice destocking ➔ error of 300 calories/person/day
  - No net destocking observed, given non-seasonal stocking
- Daily visits for diary checking in HIES also allowed starting and ending food stocks to be measured, but extended to more foods in 2010 than in 1996

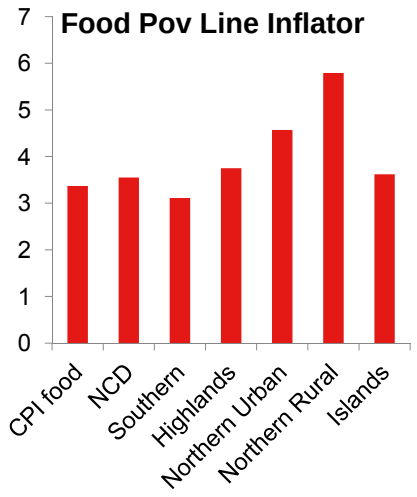
➔ non-compliance causes apparent destocking

First threat to comparability

- No community price survey in HIES
- PNG exactly type of environment where prices are unequal over space ➔ nominal ≠ real living standards
  - Instead use transaction-level records from diaries (over 400,000 in total)
  - Restrict attention to specification used in 1996
    - E.g. 1 kg Trukai rather than 1 kg Roots
      - To use price of Roots would be a downgrade in the dietary quality that the food poverty line buys
    - Less easy for fresh produce, meats etc
      - Self-reported weights are not necessarily reliable for foods not sold by weight ➔ unit prices are questionable
        - 5-fold higher unit price if use gram records vs kg ones

Regional food poverty lines show uneven 'inflation'

- Item-specific prices from diaries v. 1996 price survey gives food poverty line inflator close to the movement in CPI for food, for NCD and Southern
- Much higher apparent inflation in northern region (Momase) especially rural
  - Previously the lowest poverty line and a high poverty rate
  - Evidence of further shift in poverty to this region depends on imperfect updating for prices



15

Why Not Use the CPI?

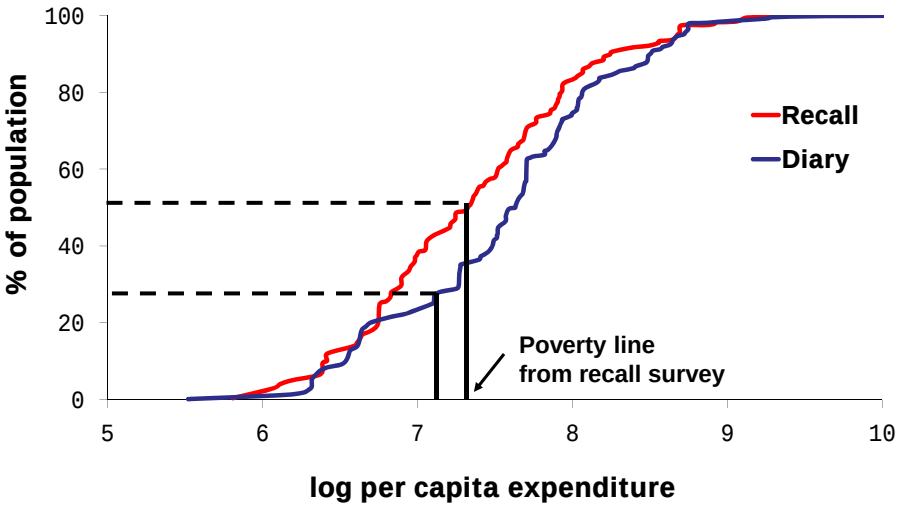
- CPI had a 36 year old urban basket, priced in just four towns not well integrated with rural economy
  - Specifications that are now rarely consumed and in markets that are no longer representative (e.g. Goroka not Hagen)
  - Doubtful that price movements are same as those experienced in rural areas and provides no way to measure regional shifts
- Questions posed by the changing value of the food poverty lines
  - Is local food production keeping up with demand pressure?
    - Since 1961/62 Survey of Indigenous Agriculture, food production stats for PNG broadly assume that growth in output ≈ population growth
  - Is food market integration advancing, since regional variation in food poverty line has reduced
  - What has happened in rural Momase to raise prices?

Second threat to comparability

- Much more intensive surveying effort
  - Switch from a recall survey to an intensively supervised diary would normally be expected to raise measured consumption and lower estimated poverty
  - Surprisingly few controlled comparisons to confirm this
  - 1996 survey had a limited experiment in Port Moresby with diary vs recall
    - But reliance on the market and greater number of transactions may make diary-recall gap in urban area an overstatement of expected gap in rural areas
- non-compliance on diary-keeping and end stock recording introduces doubt into the direction of bias in the temporal comparison

Diary vs recall in 1996 Port Moresby

(only 106+106 HHs)

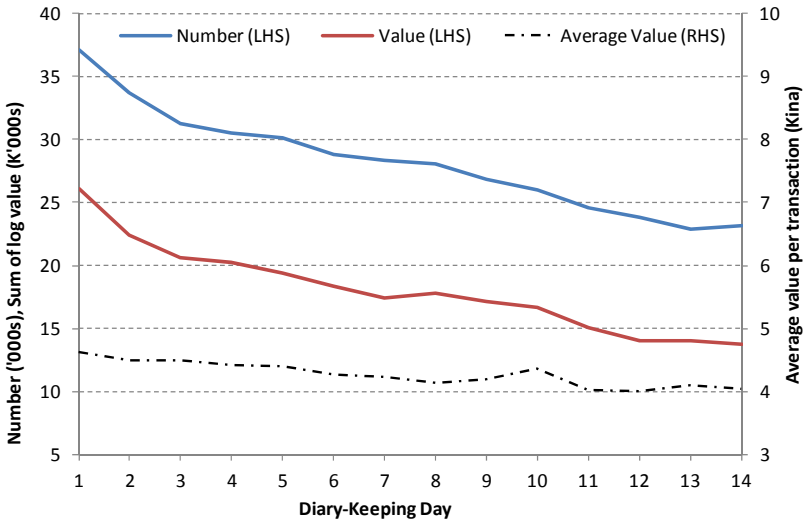


Problems with the nominal data

- Contrary to expectations of diaries capturing higher recorded consumption
- Evidence of diary fatigue
  - Number of transactions declines by 3.4% per day
    - Not through aggregating into fewer, larger transactions
    - Average value of transaction falls slightly
  - Total value of consumption transactions declines by 4.4% per day of diary keeping period
- Non-fatigue causes?
  - Diaries started on any day of the week (slightly less on Sunday) so no timing cause for the decline
  - No break between one diary and another – continuous monitoring

19

Diary Fatigue Evident



20

Problems with the nominal data (2)

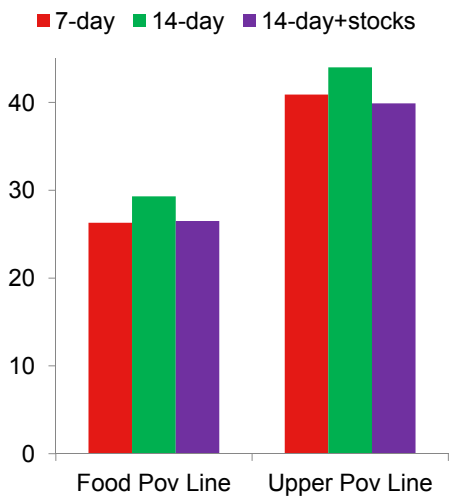
- Stock measurement also seems affected by fatigue
  - Reported ending food stocks much lower than starting stocks, contrary to what non-seasonal stocking would look like
  - Contrary to pattern in 1996 stocks data
    - 2009/10 measured stocks of over 100 food items versus 18 in 1996
  - Apparent destocking adds 6% to value of food consumption
- Created 3 aggregates to see if poverty measurements and poverty profile are robust to these problems
  - 7 day food and frequent (× 52.14) + infrequent
  - 14 day food and frequent (× 26.07) + infrequent
  - 14 day food + stock change and frequent (× 26.07) + infrequent

21

Headcount poverty rates with three consumption aggregates

- 14-day rather than 7-day adds 3-4 percentage points to headcount rates
- Adding the apparent destocking of food reduces headcount back to what it would be if using 7-day and no stock measurements
- Two errors working to offset each other

➔ mainly use 14-day+stocks



22

Summary comparison of the two surveys

1996 PNGHS

- Bounded recall (33 food, 28 freq non-food), average duration 13 days
- 12 HHs per rural EA, 6 per EA in capital city
  - Diaries for half capital city sample, or bounded recall
- Measuring device (empty 25 sack given for garden produce) used for 90% of root crops, 50% of others + weighing trials ➔ kgs
  - Average 80 kgs root crops during obs period
- Market survey (2 visits)

2009/10 HIES

- 14 day personal diary with daily or semi-daily checks by interviewers
  - Transaction level, with brand, unit size, price etc
  - 5-digit coding at head office
  - Personal notepad used in addition to the diary
- 18 HHs per rural EA, 6 in urban EA
- Self-reported kg or grams for own-production, gifts, purchases, no validation
- No market survey

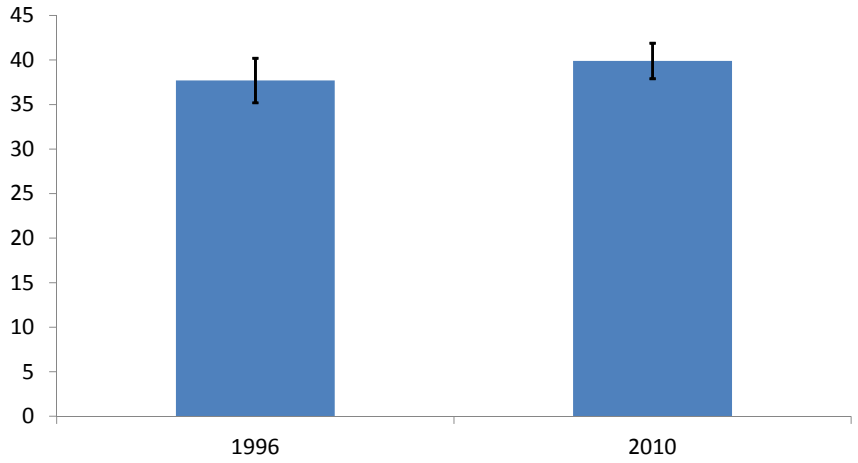
23

What Do the Results Show?

- Notwithstanding all the caveats due to imperfect comparability...
- There is no evidence of any decline in poverty in PNG between 1996 and 2009/10
  - No progress at all towards the first of the MDGs
  - An outlier in the East Asia and Pacific region, which has seen historically unprecedented poverty reduction in the last two decades
    - See *Economist* from early June (“End of Poverty”)
- Poverty in Port Moresby risen to be similar to the national average rate
  - But still only home to 6% of the total poor, so ‘urbanization of poverty’ story should not be overstated

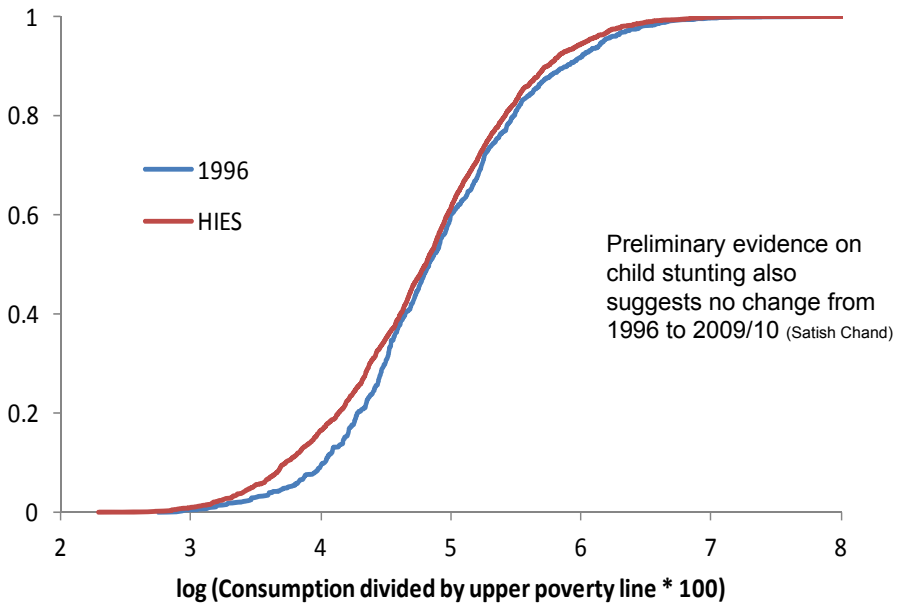
24

PNG Headcount poverty rate, upper poverty line (p=0.493 for null of no change)



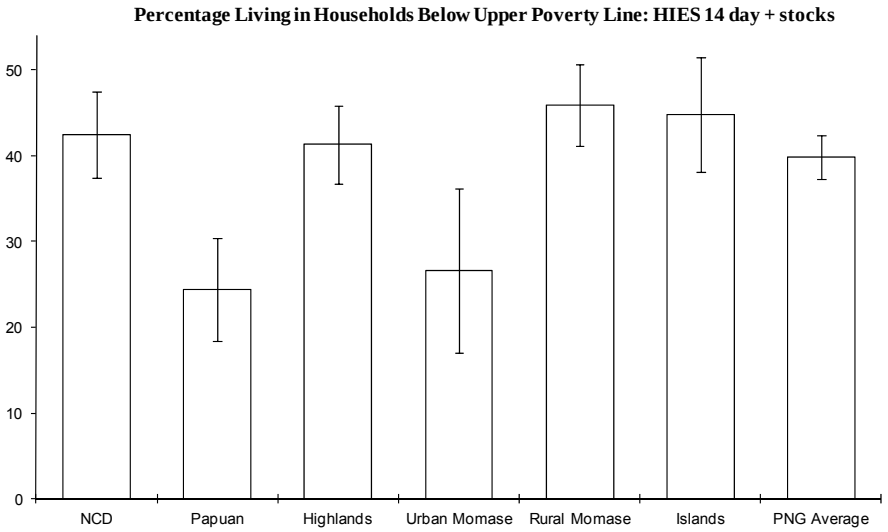
25

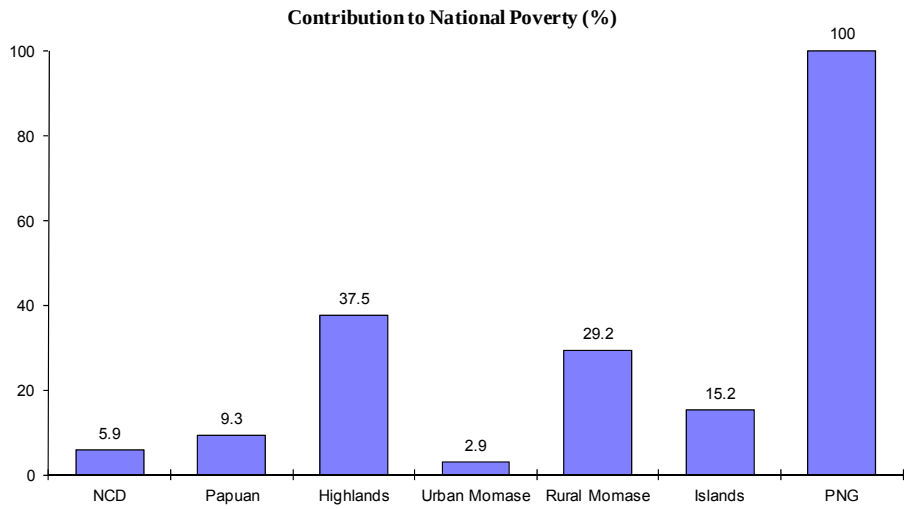
No Stochastic Dominance (1st, 2nd or 3rd order)



Preliminary evidence on child stunting also suggests no change from 1996 to 2009/10 (Satish Chand)

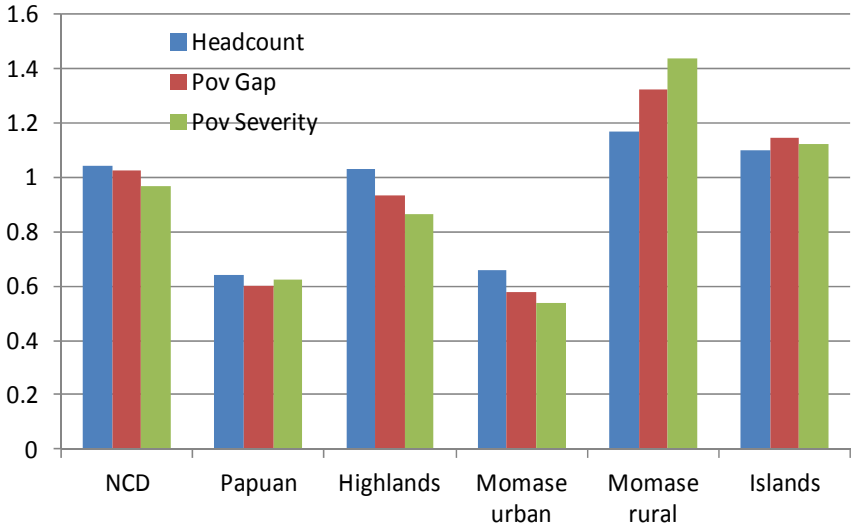
Regional Poverty Profile





Relative Poverty Rates ('risk') in 2010

(Upper poverty line, 14 day diaries plus stock changes)



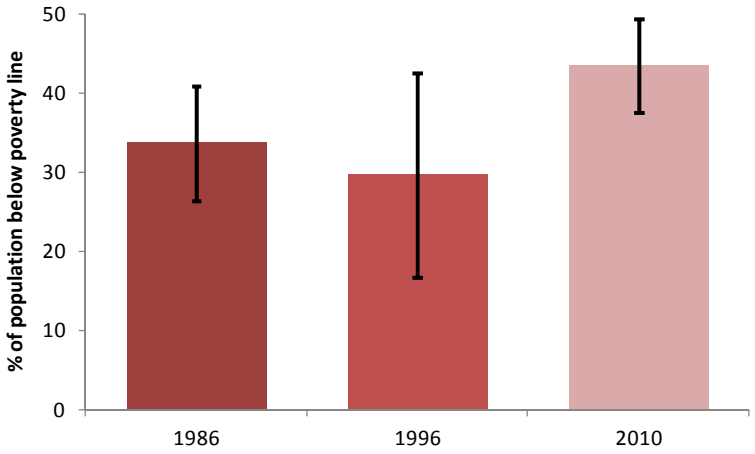
NCD: average risk, even as consider distribution-sensitive measures
Rural Momase: high risk of being poor, rises for depth/severity measures

Temporal Poverty Comparisons for Port Moresby

- 1986 Urban Household Survey (UHS), one-half of the Port Moresby sample in 1996 PNGHS and the 2009/10 HIES all use similar expenditure diaries
  - Fewer comparability issues than the PNG-wide temporal comparisons
  - CPI for Port Moresby available to update the Port Moresby-specific poverty line
    - K623 per adult equivalent in 1986
    - K1265 in 1996 and K3500 in 2009/10
- Increase in poverty between each survey, but of a different nature each time
  - Initial increase in severity of poverty (inequality amongst poor)
  - Then increase in the prevalence of poverty

Changing Prevalence of Poverty

(Head Count Index for Port Moresby)



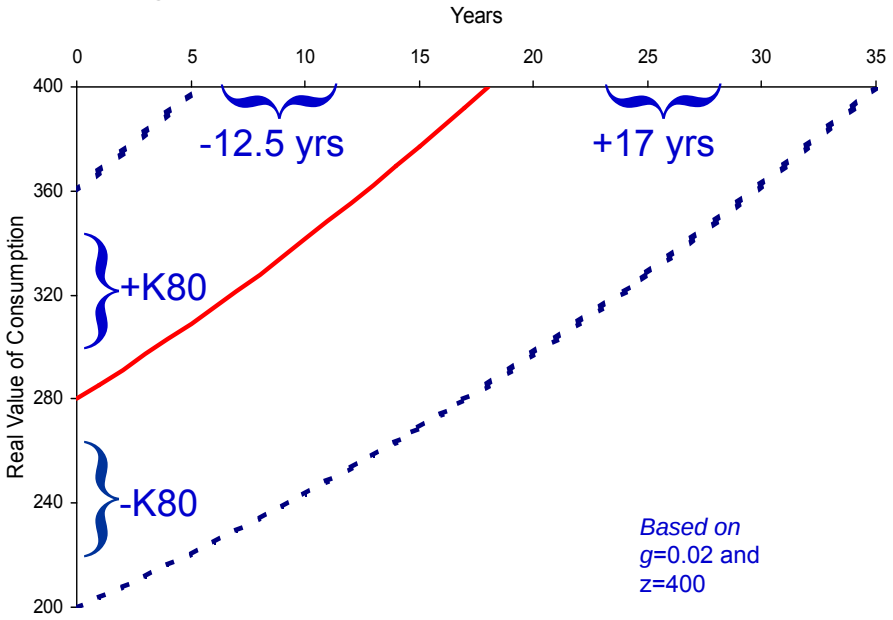
Statistically significant increase ($p<0.05$) from 1996 to 2010, no change from 1986 to 1996

31

Poverty exit time

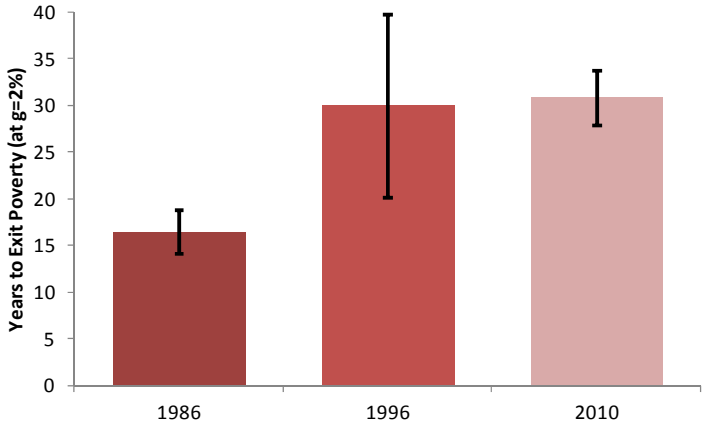
- Distribution-sensitive measure with an intuitive interpretation
- expected time taken to exit poverty under ideal conditions of constant and uniform growth rate
- Sensitive to inequality amongst the poor,
  - average exit time rises with more inequality, even if average poverty gap is unchanged
- maps cross-sectional information on the distribution of consumption into time units
  - Require panel data to study actual exit time, which will always be higher due to volatile and unevenly distributed growth rate

Example showing sensitivity to inequality of average exit time measure



Changing Severity of Poverty

(Average Exit Time Amongst the Poor in Port Moresby)



Statistically significant increase (p<0.05) from 1986 to 1996, but no change from 1996 to 2010

34

Changing patterns of urban poverty

- Poverty in Port Moresby initially worsened from 1986-1996 because the poor fell further behind
  - Decompositions show that it was due to rising inequality rather than failure of real growth as experienced at the mean
- Poverty in Port Moresby further worsened from 1996-2010 because a large proportion of non-poor joined the poor
  - Real incomes near the mean stagnating due to rapid rise in prices
- Change in the poverty profile also reflects this shift
  - In UHS in 1980s informal sector work (for household head) gave same protection against poverty as formal sector work
  - But only formal sector work gave protection against poverty by 2010 (buffering against price rises), informal sector no better than having economically inactive household head

Conclusions

- no evidence of any decline in poverty in PNG between 1996 and 2009/10
  - Evidence base for temporal poverty comparisons in PNG is weak
    - due especially to lack of price data for comparing cost of living over time and space
- Firmer (and longer term) evidence available for Port Moresby
  - Poverty has recently become more widespread, previously it had become more severe
    - Rapidly rising costs of living are major contributor