

**N.i.D.S.**  
NATIONAL INCOME DYNAMICS STUDY

# Poverty: Analysis of the NIDS Wave 1 Dataset

Discussion Paper no. 13

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# 1. Introduction

This report offers a brief application of the 2008 income and expenditure data from the National Income Dynamics Study (NIDS) to the analysis of poverty in South Africa.<sup>1</sup> The per capita figures of household income and expenditure were constructed by dividing the final derived figures for total income and total expenditure in the data by the number of people living in the household.<sup>2</sup> All of the analysis below makes use of post-stratified sampling weights in order to make the results reflective of the South African population, rather than the NIDS sample. Conventional poverty measures and dominance analyses are presented and interpreted in aggregate as well as across race and geographical area.

Section 2 of this report provides a racial overview of poverty in South Africa while Section 3 adopts a spatial approach. Sections 4 and 5 discuss poverty dominance in South African society and some salient features of poor households respectively. Section 6 provides a brief comparison between the NIDS 2008 findings and other research on contemporary poverty in South Africa and Section 7 concludes.

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<sup>1</sup> For the construction of household income and expenditure please see Argent, J. & I. Woolard. July 2009. "Income: Report on NIDS Wave 1". *Technical Paper no. 3.* and Finn, A., S. Franklin, M. Keswell, M. Leibbrandt & J. Levinsohn. July 2009. "Expenditure: Report on NIDS Wave 1". *Technical Paper no. 4.* respectively.

<sup>2</sup> The income and expenditure variable names are w1\_hhincome and w1\_h\_expenditure respectively in the household derived variable folder.

## 2. A Racial Overview of Poverty in South Africa

In this section we look at poverty through the lens of the Foster-Greer-Thorbecke<sup>3</sup> (FGT) poverty indices. For the choice of poverty lines we follow Hoozeveen and Özler (2005), using a lower bound line of R322 and an upper bound line of R593<sup>4</sup>, income per capita per month in 2000 prices. Inflating these forward to 2008 prices using CPI we obtain lower and upper bound poverty lines of R502 and R924 respectively.

Of the three FGT poverty indices, the one that is easiest to interpret is the  $P_0$  measure, which is simply the headcount ratio. That is, it gives the percentage of people in a population who fall under a given poverty line. The  $P_1$  measure is generally interpreted as the “poverty gap ratio” and this figure, when multiplied by the poverty line, indicates how much money needs to be taken from every person in the economy and then given to the poor in order for every person to be above the poverty line. The  $P_2$  measure is known as the “squared poverty gap ratio” and is not as easily interpreted as the two previous measures. However, it weights the poorest of the poor more heavily in its calculation.

**Table 1: Distribution of the poor by race – poverty line of R502 per capita per month**

<b>Income Poverty</b>							
	Pop. Share	Poverty Measure			Poverty Shares		
		$P_0$	$P_1$	$P_2$	$P_0$	$P_1$	$P_2$
African	79.3%	56.1%	26.0%	15.5%	94.0%	95.4%	96.0%
Coloured	8.9%	27.4%	9.9%	4.9%	5.2%	4.1%	3.4%
Asian/Indian	2.6%	8.5%	1.8%	0.8%	0.5%	0.2%	0.2%
White	9.2%	1.5%	0.8%	0.6%	0.3%	0.3%	0.4%
Overall	100%	47.3%	21.6%	12.79%	100%	100%	100%

<b>Expenditure Poverty</b>							
	Pop. Share	Poverty Measure			Poverty Shares		
		$P_0$	$P_1$	$P_2$	$P_0$	$P_1$	$P_2$
African	79.3%	62.8%	31.5%	19.0%	93.5%	95.5%	96.4%
Coloured	8.9%	31.7%	11.9%	5.8%	5.3%	4.0%	3.3%
Asian/Indian	2.6%	16.7%	2.5%	0.6%	0.8%	0.2%	0.1%
White	9.2%	2.5%	0.8%	0.3%	0.4%	0.3%	0.2%
Overall	100%	53.3%	26.2%	15.6%	100%	100%	100%

<sup>3</sup> These are also known as the  $P^\alpha$  class of poverty measures.

<sup>4</sup> These lines were drawn up using a “cost of basic needs” approach. For more information on poverty lines see Woolard and Leibbrandt (2005).

Table 1 above shows the FGT poverty measures and associated poverty shares for both income and expenditure, disaggregated by racial groups for a poverty line of R502 per capita per month. The overall poverty rate in the country stands between 47% and 53%, depending on whether an income or expenditure measure is used. The mean income for those below the lower poverty line is R273 per capita per month while the mean expenditure is R255 per capita per month. This stands in contrast to the overall (poor plus non-poor) mean per capita income and expenditure per month which stand at R1705 and R1479 respectively. These conclusions are consistent with previous work done on poverty in South Africa (for example see Aron *et al*, 2009).

Africans experience by far the highest incidence of poverty with 56.1% and 62.8% living in poverty for the income and expenditure measures respectively. Coloureds have the second highest prevalence of poverty with 27.4% and 31.7% for each of the welfare measures. The percentage of Asian/Indians living in poverty almost doubles as we move from an income measure to an expenditure measure. Whites, by comparison, experience almost no poverty at all at the lower poverty line. Both measures show Africans bearing the brunt of poverty in South Africa, with a greater than 90% share of poverty. This is far in excess of their population share.

The  $P_1$  and  $P_2$  measures further suggest that Africans also experience poverty in greater depth and severity than the other racial groups. For both the income and expenditure figures, the poverty share of Africans increases as one moves from  $P_0$  to  $P_1$  and then to  $P_2$  and the emphasis on the poorest of the poor rises. By contrast, the poverty shares of all other racial groups tend to decrease across these measures. Overall, while Coloureds clearly experience significant poverty; it is neither as high in incidence nor as severe as the poverty experienced by Africans, who make up 79.3% of the sampled population.

**Table 2: Distribution of the Poor by Race – Poverty Line of R924 per Capita per Month**

<b><u>Income Poverty</u></b>							
	<b>Pop. Share</b>	<b>Poverty Measures</b>			<b>Poverty Shares</b>		
		P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>
African	79.3%	75.8%	45.0%	30.9%	91.5%	93.6%	94.6%
Coloured	8.9%	48.5%	23.2%	13.7%	6.6%	5.4%	4.7%
Asian/Indian	2.6%	27.1%	7.1%	3.5%	1.1%	0.5%	0.3%
White	9.2%	6.4%	2.0%	1.1%	0.8%	0.5%	0.4%
Overall	100%	65.7%	38.1%	25.9%	100%	100%	100%

<b><u>Expenditure Poverty</u></b>							
	<b>Pop. Share</b>	<b>Poverty Measures</b>			<b>Poverty Shares</b>		
		P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>
African	79.3%	79.7%	50.3%	35.9%	91.9%	93.5%	94.5%
Coloured	8.9%	52.7%	26.7%	16.2%	6.8%	5.6%	4.8%
Asian/Indian	2.6%	21.5%	10.3%	5.3%	0.8%	0.6%	0.4%
White	9.2%	3.4%	1.8%	1.0%	0.5%	0.3%	0.3%
Overall	100%	68.8%	42.8%	30.1%	100%	100%	100%

Table 2 above provides the same breakdown as Table 1 but with a higher poverty line of R924 per capita per month for both income and expenditure. As a result of the application of this higher poverty line, the share of the population classified as poor jumps to 65.7% according to the income measure and 68.8% according to the expenditure measure. The average incomes and expenditures per capita for those that fall under the R924 poverty line are R388 and R350 respectively.

Africans are, once again, the dominant presence amongst those who fall under the upper poverty line, with more than three quarters being poor. Of the total number of people that fall under this poverty line, over 90% are African. These African shares are somewhat lower than at the lower poverty line and the Coloured share rises. This reflects the fact that there are a more than proportionate number of Coloureds with incomes and expenditures lying between the low poverty line and the high line.

### 3. A Spatial Overview of Poverty in South Africa

Table 3 below shows a decomposition of poverty across geographical areas for both poverty lines. Only the income measures are provided in the table as the same general trends are reflected in the expenditure measures of poverty by geo-type.

It is immediately clear from the table that tribal areas are the poorest, having 74% and 89.7% poverty incidence rates respectively applying to each of the poverty lines. The share of poverty for tribal areas also increases as we progress across measures of the depth and severity of poverty using either poverty line. While formal urban areas have the lowest incidence of poverty by quite a substantial margin, they still have a 45% incidence using the upper bound poverty line. Using the lower bound line, these areas have a poverty incidence rate of just over 27%.

**Table 3: Distribution of the Poor by Geo-type – Income Figures Only**

<b><u>Poverty Line of R502 per capita per month</u></b>							
	<b>Pop. Share</b>	<b>Poverty Measures</b>			<b>Poverty Shares</b>		
		P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>
Rural Formal	6.6%	39.0%	14.4%	7.4%	5.5%	4.4%	3.8%
Tribal	33.7%	74.0%	37.3%	22.9%	52.8%	58.4%	60.7%
Urban Formal	48.6%	27.1%	10.8%	6.0%	27.9%	24.4%	22.9%
Urban Informal	11.1%	58.6%	24.8%	14.5%	13.8%	12.8%	12.6%
<b><u>Poverty Line of R924 per capita per month</u></b>							
	<b>Pop. Share</b>	<b>Poverty Measure</b>			<b>Poverty Shares</b>		
		P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>
Rural Formal	6.6%	71.4%	33.3%	19.9%	7.2%	5.8%	5.1%
Tribal	33.7%	89.7%	58.6%	42.3%	46.0%	51.9%	55.1%
Urban Formal	48.6%	45.0%	22.5%	14.1%	33.4%	28.8%	26.6%
Urban Informal	11.1%	80.3%	46.3%	30.8%	13.6%	13.5%	13.2%

**Table 4: Distribution of the Poor by Province – Income Figures Only**

<b><u>Poverty Line of R502 per capita per month</u></b>							
	<b>Pop. Share</b>	<b>Poverty Measures</b>			<b>Poverty Shares</b>		
		P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>
Western Cape	10.8%	23.2%	8.9%	4.8%	5.3%	4.5%	4.1%
Eastern Cape	13.5%	63.5%	35.3%	23.3%	18.2%	22.1%	24.7%
Northern Cape	2.3%	32.9%	12.7%	6.7%	1.6%	1.4%	1.2%
Free State	5.9%	45.8%	18.5%	10.3%	5.8%	5.1%	4.8%
KwaZulu-Natal	20.8%	62.8%	28.8%	16.7%	27.7%	27.8%	27.2%
North West	7.0%	42.9%	18.6%	10.8%	6.4%	6.1%	5.9%
Gauteng	21.4%	29.9%	11.7%	6.5%	13.6%	11.1%	11.0%
Mpumalanga	7.4%	43.6%	17.6%	9.5%	6.8%	6.0%	5.5%
Limpopo	10.9%	63.9%	30.6%	18.4%	14.6%	15.9%	15.6%

<b><u>Poverty Line of R924 per capita per month</u></b>							
	<b>Pop. Share</b>	<b>Poverty Measures</b>			<b>Poverty Shares</b>		
		P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>
Western Cape	10.8%	46.5%	21.1%	12.4%	7.6%	6.0%	5.8%
Eastern Cape	13.5%	80.0%	52.6%	39.2%	16.5%	18.7%	20.4%
Northern Cape	2.3%	58.5%	28.6%	17.2%	2.1%	1.8%	1.5%
Free State	5.9%	66.8%	36.4%	23.6%	6.0%	5.7%	5.3%
KwaZulu-Natal	20.8%	80.7%	49.3%	34.0%	25.5%	26.8%	27.2%
North West	7.0%	64.0%	34.4%	22.8%	6.9%	6.4%	6.1%
Gauteng	21.4%	47.5%	24.2%	15.3%	15.5%	13.7%	12.6%
Mpumalanga	7.4%	59.9%	34.1%	22.4%	6.7%	6.6%	6.3%
Limpopo	10.9%	80.3%	50.3%	35.5%	13.2%	14.3%	14.8%

Table 4, above, presents a picture of poverty across the provinces. The Eastern Cape, KwaZulu-Natal and Limpopo have the highest poverty incidence rates of around 63% for the lower poverty line and around 80% for the upper poverty line. The poverty shares make particularly interesting reading. About a quarter of South Africa's poor live in KwaZulu-Natal, a province with a higher poverty share than population share. Gauteng comprises 21.4% of the population and has a between 13% and 15% of the country's poor. It is also one of only two provinces (the Western Cape being the other) with a poverty incidence rate of below 50% for the upper poverty line of R924 per capita per month.

## 4. Poverty Dominance

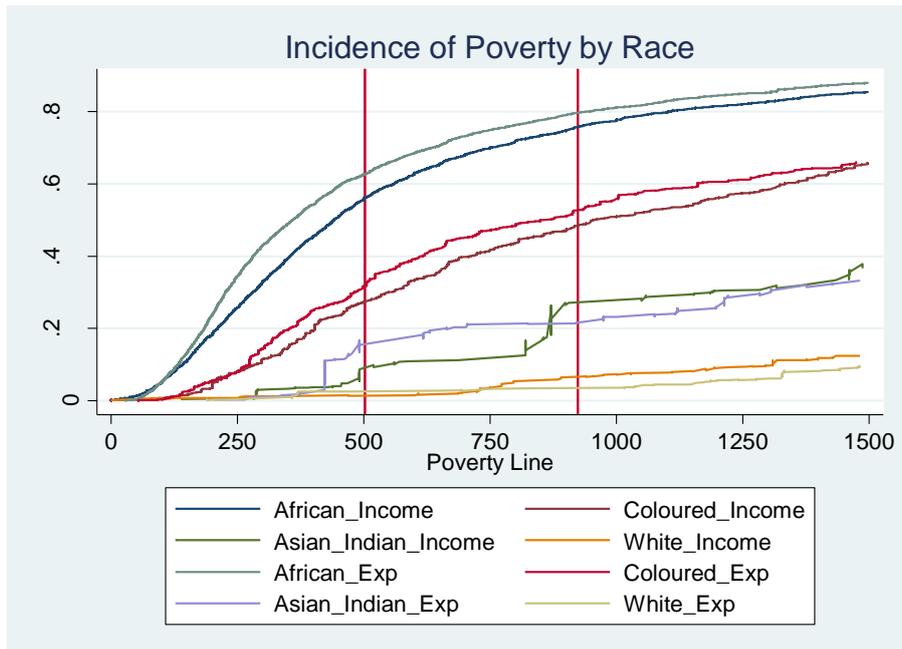
The somewhat arbitrary choice of a poverty line is avoided by dominance analysis with the use of cumulative distribution functions (CDFs). If all the per capita income or expenditure values are plotted on the horizontal axis from the lowest to the highest, then the CDF shows the cumulative proportion of the population earning less than or equal to each per capita income or expenditure value in the distribution. A particularly useful way to think about these CDFs in the poverty context is that they tell one the head count ratio that would apply if each per capita income or expenditure value were chosen as a poverty line. Sections 2 and 3 above derived a poverty analysis around two particular poverty lines. The CDFs facilitate a more generic view of poverty than this.

The CDFs of income and expenditure by race in the Figure 1 below show the ranking of poverty discussed in the previous section at a full range of per capita income and expenditure values up to R1500. The vertical red lines on the graph illustrate the two poverty lines discussed earlier. The African CDF lies above that of the Coloured at all income and expenditure values. Both of these CDFs lie far above the Asian/Indian and White CDFs. This is a compelling graphical representation of the fact that the poverty rankings discussed earlier for the two poverty lines are robust for all poverty lines below R1500<sup>5</sup>. In other words, this diagram illustrates first order poverty dominance of White over Asians/Indians over Coloureds over Africans respectively for both the income and expenditure measures of poverty.

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<sup>5</sup> At which point about 75% of the population would be classified as poor.

**Figure 1: CDFs by Racial Group for Income and Expenditure Measures**



**Figure 2: CDFs by Geo-type for Income and Expenditure Measures**

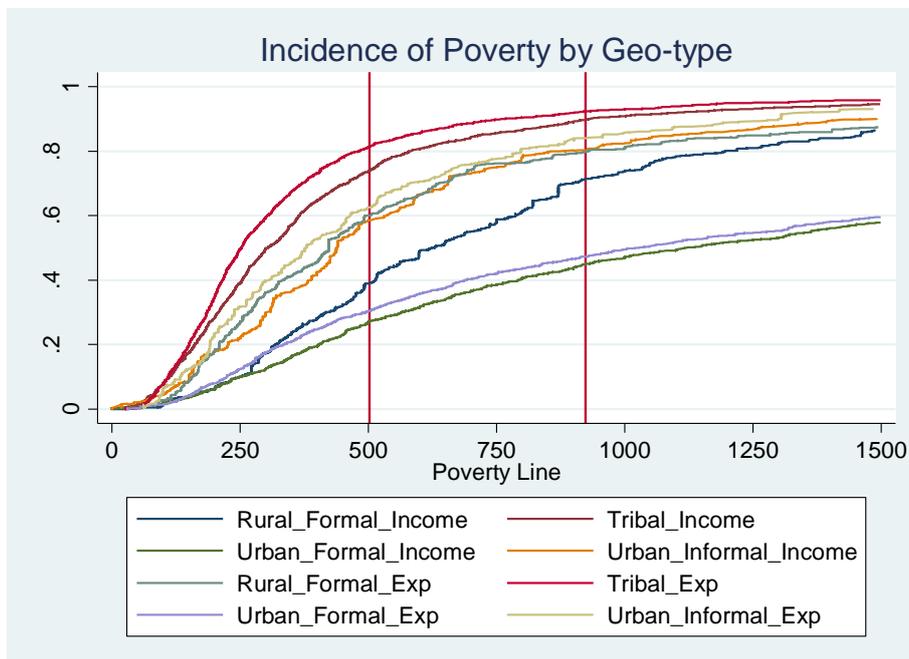


Figure 2, above, above gives the per capita income and expenditure CDFs across geo-type categories. It is clear that tribal areas are poorer (first order poverty dominated) over all other areas by both income and expenditure measures. Formal urban areas are poverty dominate all other areas except rural formal's income measure, the CDF of which coincides with it briefly

below R280. The rural formal measures of poverty differ markedly depending on whether an income or expenditure method is adopted. Between our upper and lower bound poverty lines the rankings remain relatively clear from poorest to wealthiest: Tribal, urban informal, rural informal, urban formal. This provides strong reinforcement of the conclusions drawn from the FGT measures in the previous section.

## 5. Some Key Features of Poor Households

In Table 5, below, poor households are profiled against non-poor households and the population at large. In this case a household is classified as poor if the income per capita of the household falls below the lower poverty line of R502 per month.

Poor households tend to have more people living in them than those households above the poverty line. The average age of those living in poor households is about 8 years lower than those in non-poor households. The mean number of years of education attained by the household head stands at 6 years for poor households in comparison to 9.3 years for non-poor households and 8.2 years for the whole population. Most poor households are headed by women and it is striking that the proportion of male-headed households is so much higher for non-poor households. Finally, as is to be expected, the broad definition of unemployment reflects an unemployment rate of 53.6% in poor households – far higher than our national estimate of 31.1%.

**Table 5: Key differences between poor and non-poor households**

	<b>Poor</b>	<b>Non-Poor</b>	<b>Overall</b>
Mean Household Size	4.8	2.9	3.9
Mean Household Age	21.9	30.1	26.2
Household Head Mean Education	6.0	9.3	8.2
Male Headed Household	42.2%	68.8%	59.9%
Unemployment Rate	53.6%	19.7%	31.1%

## 6. Comparisons with Other Poverty Studies

NIDS did not ask questions about total annual income and expenditure. Rather, it asked about the income and expenditure received and spent by a household during the past month. This method aims to significantly reduce recall bias, but this does mean that one has to proceed with caution when comparing the income and expenditure aggregates with previous studies that measure income and expenditure over a longer period. This caveat should be kept in mind when viewing the brief comparison of findings in this section.

Given the use of the poverty lines from Hoogenveen and Özler (2005), it is appropriate to compare the results of this analysis with theirs. Table 6 below is derived from Hoogenveen and Özler (2005) and shows their results for 1995 and 2000 using their lower bound poverty line. Direct comparison with this table suggests that African and Coloured poverty has fallen since 2000. Of course direct comparison of these results with those in this report is problematic because they were constructed using consumption aggregates rather than income. Constructing consumption aggregates for the purpose of a more appropriate comparison is left to future work.

**Table 6: Poverty Rates for 1995 and 2000**

**Poverty Line = R322 per Capita per Month**

	1995			2000		
	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>
African	68%	32%	19%	67%	34%	24%
Coloured	50%	19%	10%	35%	13%	1%
Asian/Indian	8%	2%	1%	7%	2%	1%
White	1%	0%	0%	1%	0%	0%

*Source: Derived from Hoogenveen and Özler (2005)*

Comparison to the IES 2005/2006 results (Stats SA, 2009) with the preliminary results from NIDS is confounded by several issues. The design issues mentioned in the introduction to this section are particularly relevant here. In addition, the category aggregation of income differs somewhat between NIDS and the IES which makes component comparisons difficult. Then, in terms of poverty rankings, direct comparison of the information on poverty from the IES 2005/2006 and NIDS is not possible because the IES results published do not include any poverty analysis. However, the IES results do at least give a brief note on the distribution of incomes across racial groups and their rankings agree perfectly with those of NIDS. That said, the mean incomes are not particularly useful in terms of poverty analysis.

## 7. Conclusion

This report has provided a brief snapshot of poverty in South Africa as reflected by the NIDS income data. The results appear generally consistent with other work on this field, given some discussed caveats, which is a promising start. It is also encouraging that poverty appears to have decreased in terms of rate, depth and severity since 2000. In closing we note that it is inappropriate to regard the contents of this report as any authoritative statement on South African poverty. Rather this is an initial picture of NIDS that gives some idea of the direction of forthcoming research that will deal more fully with the complex issues involved.

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