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The Administrative Officer
Centre for Social Science Research
University of Cape Town
Private Bag
Rondebosch, 7701
Tel: (021) 650 4656
Fax: (021) 650 4657
Email: kforbes@cssr.uct.ac.za

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Murray Leibbrandt is a Professor in the School of Economics at the University of Cape Town and the Director of the Southern Africa Labour and Development Research Unit (SALDRU) within the Centre for Social Science Research (CSSR).

Laura Poswell is a Senior Researcher at the Development Policy Research Unit (DPRU), University of Cape Town.

Pranushka Naidoo is a Researcher at the DPRU, University of Cape Town.

Matthew Welch is the Deputy Director of the Data First Resource Unit within the CSSR.

Ingrid Woolard is a Research Fellow at the School of Development Studies, University of KwaZulu-Natal.

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Measuring recent Changes in South African Inequality and Poverty using 1996 and 2001 Census Data

Abstract

The paper analyses poverty and inequality changes in South Africa for the period 1996 to 2001 using Census data. To gain a broader picture of wellbeing in South Africa, both income-based and access-based measurement approaches are employed. At the national level, findings from the income-based approach show that inequality has unambiguously increased from 1996 to 2001. As regards population group inequality, within-group inequality has increased; while between-group inequality has decreased (inequality has also increased in each province and across the rural/urban divide). The poverty analysis reveals that poverty has worsened in the nation, particularly for Africans. Provincially, the Eastern Cape and Limpopo have the highest poverty rates while the Western Cape and Gauteng have the lowest poverty rates. Poverty differs across the urban-rural divide with rural areas being relatively worse off than urban areas. However, due to the large extent of rural-urban migration, the proportion of the poor in rural areas is declining. The access-based approach focuses on type of dwelling, access to water, energy for lighting, energy for cooking, sanitation and refuse removal. The data reveal significant improvements in these access measures between 1996 and 2001. The proportion of households occupying traditional dwellings has decreased while the proportion of households occupying formal dwellings has risen slightly (approximately two-thirds of households occupy formal dwellings). Access to basic services has improved, especially with regard to access to electricity for lighting and access to telephones. On a provincial level, Limpopo and the Eastern Cape display the poorest performance in terms of access to basic services. The paper concludes by contrasting the measured changes in well being that emerge from the income and access approaches. While income measures show worsening well being via increases in income poverty and inequality, access measures show that well being in South Africa has improved in a number of important dimensions.

1. Introduction

Changes in inequality and poverty are key prongs of the transformation of any economy. Two quantitative dimensions of this broad inequality and poverty picture are changes in the distribution of income and changes in access to services. This paper will discuss changes in the levels and composition of income and access inequality and poverty between 1996 and 2001 using the 10 per cent micro samples from the 1996 and 2001 censuses. The size of the data sets and their national reach make them well suited to such an assessment of changes to national well-being. However, the usefulness of the comparison depends on the quality of the data on incomes and access to services.

We table a few major data issues in this introduction.[1] Then, Sections 2 and 3, respectively, present the key results for changes in income inequality and poverty. In section 4, we present an analysis of access to goods and services; this section focuses on housing and access to clean water, electricity and sanitation. In Section 5, we briefly compare the income-based measures of well-being and the access-based measures of well-being. Section 6 concludes the paper.

The income data in the census is far from ideal (Cronje & Budlender, 2004) and a lot of work is necessary to get the data sets into shape for analysis. In particular, a number of key data decisions had to be taken in order to ensure that the data were comparable over time and that our analysis was comparable with the work of others. Two major points are worth noting here.

First, in both 1996 and 2001, data on personal income was collected in a set of income bands. These bands were not a consistent set of real income categories across the two years. This is especially true at the top end. The highest band for personal income in 1996 was R30 000 or more. This is lower than the real income equivalent of the top three bands in 2001. In order to compare the data across time, we compressed the top end of the 2001 distribution of personal incomes into the real income equivalent of the top band in 1996. As all of these bands are way above any plausible poverty line, this has no impact on the analysis of poverty. However, we are effectively compressing the top end of the 2001 income distribution, and this does have an impact on the inequality analysis.[2]

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[1] Appendix A presents a more detailed airing of these data issues and describes the derivation of comparable 1996 and 2001 income variables. On the whole, the access variables were measured in a consistent fashion across 1996 and 2001. Only the access to water variable required detailed attention. This discussion is presented in Appendix B.

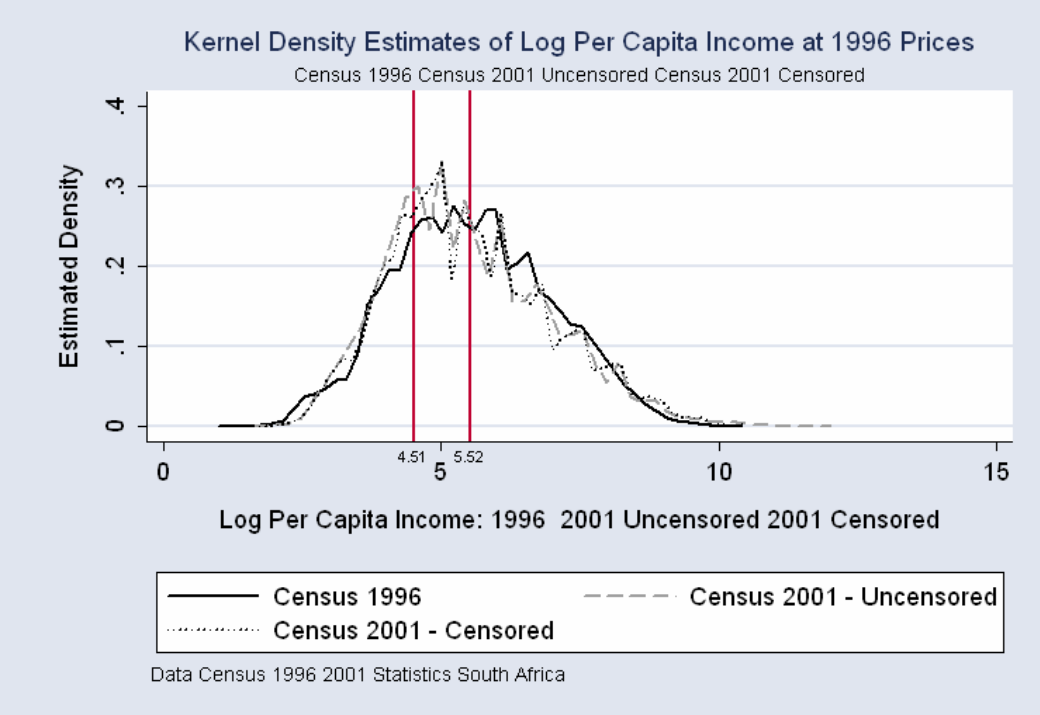
[2] See Table A.3 in Appendix A for a detailed set of results.

Second, on aggregating personal incomes into household incomes, for both 1996 and 2001, a sizeable number of households are captured as having zero incomes or missing incomes. As shown in Table A.1 in Appendix A, these zero-income households and the missing-income households account for 23 per cent of households in 1996 and 28 per cent of households in 2001. This is a large percentage of each sample. It is highly unlikely that all of these zeros are genuinely households in which all adult members earned no income in 1996 or in 2001. For comparative purposes, we exclude these zeros from the poverty and inequality analysis presented in the body of the paper.

As this decision effectively removes a group of households who currently make up the bottom of the distribution, it has a strong impact on measured poverty levels and also narrows inequality. Therefore, it is important to know as much as possible about these people and what sort of impact this decision has on the measure of poverty and inequality. Table A.2 in the Appendix presents a profile of these missing and zero households. It shows that three of the poorest provinces, the Eastern Cape, KwaZulu-Natal and Limpopo contributed the greatest proportion of total missing and zero values in 1996 and 2001. In all three cases, this was in excess of their total population share. It also shows that in both years Gauteng, the Western Cape, Limpopo and KwaZulu-Natal had the largest percentage of missing values. The proportion of missing values for these provinces was also in excess of their total population shares. Furthermore, Tables A.3 and A.4 in Appendix A present a series of inequality and poverty measures with and without the zero-earning households for both 1996 and 2001 to give a sense of the impact of including zeros in a poverty and inequality analysis. They show that income shares and poverty shares do not change significantly across provinces when the zeros are omitted and that the magnitude of the narrowing of inequality is consistent across provinces, population groups and the rural/urban divide. Thus, while this decision changes the levels of measured poverty it should not skew the comparison of changes between 1996 and 2001. One of the reasons for spelling out these two data adjustments in some detail is to illustrate the point that this paper is directed at ascertaining accurate assessments of the changes in inequality and poverty over time, rather than deriving the best estimates of poverty and inequality in any given year. Indeed, our emphasis on obtaining comparable data for the estimates of changes over time sometimes comes at the cost of deriving the best estimates of inequality or poverty within any given year. Tables A.3 and A.5 to A.12 in appendix A present the inequality and poverty level results in more detail with their standard errors and 96 % confidence intervals. These results are presented for estimates including zero income households and excluding zero income households.

Figure 1 gives an aggregate snapshot of the change in per capita incomes in South Africa between 1996 and 2001, with 2001 incomes deflated to their 1996 equivalents for comparability purposes.[3] There are two plots for 2001. The 2001 distribution is plotted including all the top income brackets as they are found in the 2001 data as well as with the top brackets collapsed into a 1996 equivalent top band. It is clear from the figure that this censoring of the 1996 distribution does indeed narrow 2001 inequality.

Figure 1: A distributional plot of South African incomes in 1996 and 2001



This figure gives us a foretaste of the key results of the income analysis in the paper. Even with the censored data, the 2001 plot lies above the 1996 plot at the top end of the income distribution. This suggests that the top end of the 2001 distribution contains a greater share of the population than it did in 1996. Thus, there is some evidence of improved real incomes at the top end. However, apart from this group at the top, the 2001 distribution evidences a leftward shift, implying decreased real incomes for the rest of the distribution. This is particularly pronounced in the middle and lower-middle sections of the distribution, with the situation at the bottom looking largely unchanged. In this

[3] In order to keep the distribution within a narrower range without altering its shape, the graph plots the log of per capita income rather than per capita income itself. By logging we exclude all of the zero earning households. Figure 1, therefore, presents a picture of the income data as it is used in the rest of this paper.

paper we show that the net effect of all of these changes is an unambiguous increase in inequality from 1996 to 2001.

The two vertical lines drawn on the figure represent the two poverty lines that we use for all of the poverty analysis in this paper. Details of the calculation of these poverty lines are provided in Appendix A. The lower line is a $2 per day poverty line, which is widely used for international poverty comparisons. The upper line is a R250 per person per month (in 1996 rands) poverty line, which was first suggested in the poverty-mapping work of Statistics South Africa (2000). The leftward shift of incomes in the middle and lower-middle areas of the 2001 distribution suggests a slight but unambiguous increase in measured poverty between 1996 and 2001. The poverty analysis presented in this paper confirms this finding.

This income-based approach presents only one of many dimensions to the measurement of well-being in South Africa. The narrowness and limitations of this approach are revealed when we show that, over the same 1996/2001 period, there have been important improvements in access to basic goods and services for many households.

2. Changing Patterns of Income Inequality

We begin our discussion of inequality at the national level. In Figure 2, we graph the Lorenz curves for the national distribution of per capita incomes for both 1996 and 2001. Such Lorenz curves are derived by ranking per capita incomes from the poorest to the richest, and then plotting the cumulative distribution of the population on the horizontal axis and the cumulative distribution of income on the vertical axis. Thus, for example, the figure on the vertical axis that corresponds to .2 on the horizontal axis is the proportion of per capita income accruing to the poorest 20 per cent of the population. The Lorenz curve labelled ‘cumulative population proportion’ represents a hypothetical line of income equality, because it shows a situation in which the poorest 20 per cent of the population accounts for 20 per cent of per capita income. The further an actual Lorenz curve falls below this line of equality, the higher the measured inequality. As the 2001 Lorenz curve lies below the 1996 curve, the figure shows a clear widening of inequality between 1996 and 2001. If Lorenz curves cross, then the changes in the income distribution are too complex to make definitive statements about inequality increasing or decreasing. In this case, the 2001 Lorenz curve is always below the 1996 curve, which implies that the finding of increased inequality between 1996 and 2001 is sound.

Figure 2: National Lorenz curves at 1996 prices for Census 1996 and 2001

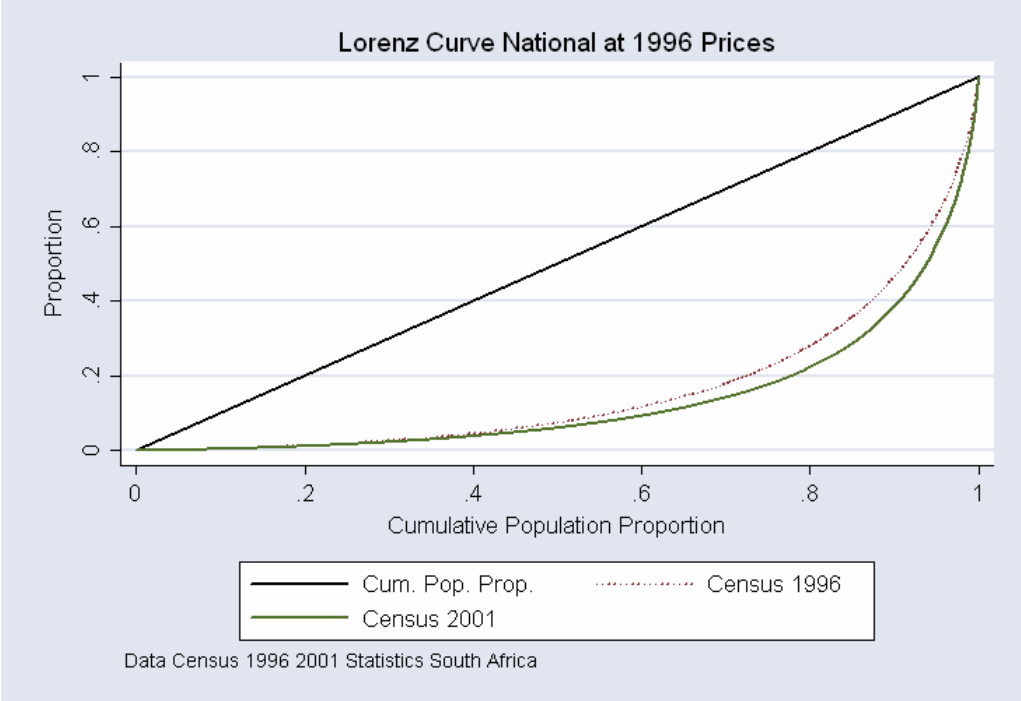


Figure 3: Lorenz curves by population group for Census 1996

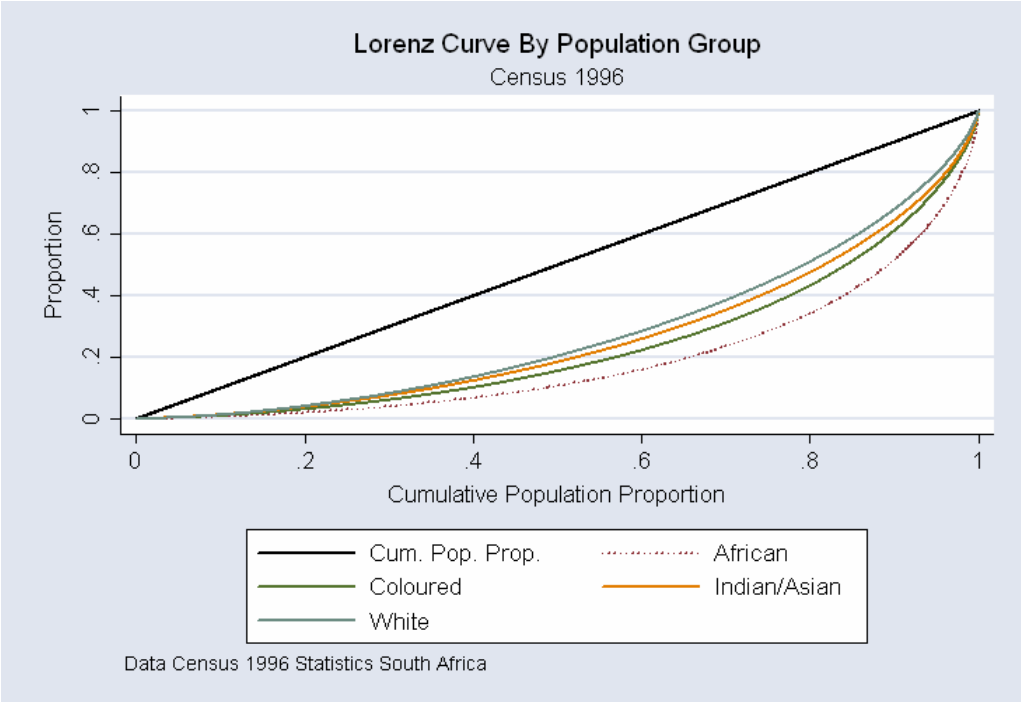


Figure 4: Lorenz curves by population group for Census 2001

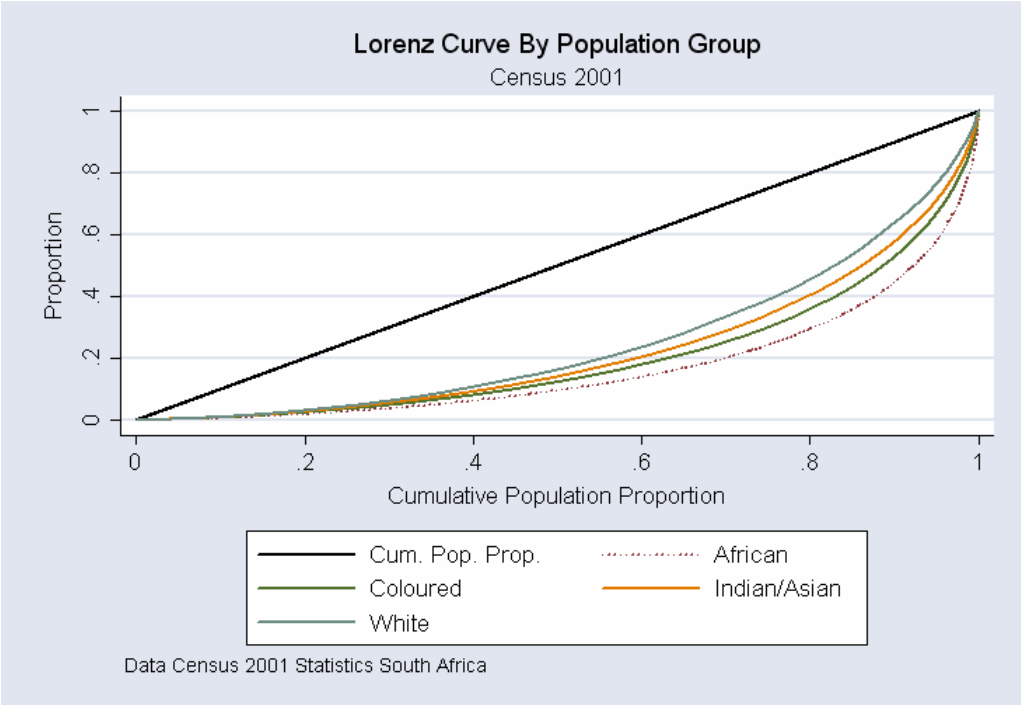
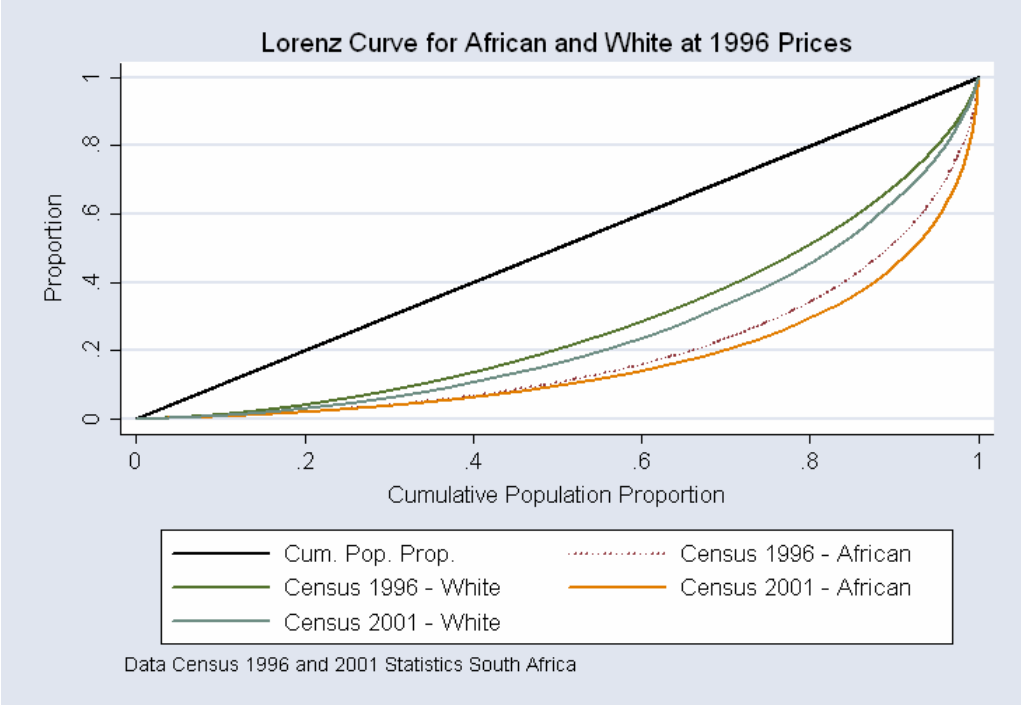


Figure 5: Lorenz curves for the African and white groups at 1996 prices for Census 1996 and 2001



Next, in order to analyse inequality by population group, we present a set of Lorenz curves for each group. Figure 3 presents the 1996 situation and Figure 4 presents the 2001 situation. Both of these figures show the same clear ranking of inequality by group. Inequality for Africans is greater than for coloureds, which is greater than for Indians/Asians, which is greater than for whites.

In order to use Lorenz curves to compare changes in inequality for different groups over the 1996 to 2001 period, it is necessary to plot these Lorenz curves for both years on the same diagram. This is done in Figure 5 for two groups – African and white. The Lorenz curves confirm our earlier finding that African inequality is greater than white inequality. The curves go further to show that inequality increased for both groups between 1996 and 2001.

Given that the Lorenz curves do not cross in any of the above figures, all of these trends are unambiguous and are not dependent on the choice of a particular inequality measure. Any acceptable inequality measure will reveal the same pattern of increasing inequality over time and the same ranking of inequality by group.

Table 1 illustrates this through the presentation of a series of results using a well-known inequality measure, the Gini coefficient. This measure of inequality ranges from 0 to 1, with 0 being no inequality and 1 being extreme inequality. Thus, the fact that our measured coefficient at the national level rises from 0.68 in 1996 to 0.73 in 2001 reflects the increase in inequality that we observed above in the Lorenz curves of Figure 2. The fact that the Gini coefficients for each population group in both 1996 and 2001 are highest for the African group and lowest for the white group confirms the Lorenz curve analysis of Figures 3 and 4. Further, the fact that the Gini coefficients rise for all groups between 1996 and 2001 confirms the analysis of Figure 5. Recent work by Hoogeveen and Ösler (2005) comparing expenditure data from the 1995 and 2000 national Income and Expenditure Surveys supports these trends. Their reported Gini coefficients are notably lower than those derived by us using census data. However, in each case, their Gini coefficients increase between 1995 and 2000.

The table also reports on comparable Gini estimates from Whiteford & Van Seventer (2000). This study used 1975, 1991 and 1996 census data to undertake a longer-run comparison of South African inequality. We see from their Gini coefficients that the widening of inequality within each group between 1996 and 2001 is the continuation of a trend going back to 1975 and is particularly acute for Africans. However, it seems that the widening of inequality at the national level between 1996 and 2001 is a break with the trend from 1975 and 1996 – for Whiteford and Van Seventer, measured inequality at the aggregate level remained high but stable over the 1975–1996 period.

Table 1: Comparisons of inequality from 1975 to 2001 using the Gini coefficient

	1975	1991	1996	1996	2001
	Whiteford & Van Seventer Estimates			Our estimates	
African	0.47	0.62	0.66	0.62	0.66
Coloured	0.51	0.52	0.56	0.53	0.60
Indian/Asian	0.45	0.49	0.52	0.48	0.56
White	0.36	0.46	0.50	0.44	0.51
National	0.68	0.68	0.69	0.68	0.73

Sources: Whiteford & Van Seventer (2000) using 1975, 1991 and 1996 census data; own calculations for 1996 and 2001, using Census 1996, 2001: Statistics South Africa.

Table 2: Inequality comparisons within and between population groups, using the Theil index

	1975	1991	1996	1996	2001
	Whiteford & Van Seventer estimates			Our estimates	
Within-group Inequality	38%	58%	67%	57%	60%
Between-group Inequality	62%	42%	33%	43%	40%
Total inequality	100%	100%	100%	100%	100%

Sources: Whiteford & Van Seventer (2000) using 1975, 1991 and 1996 census data; own calculations for 1996 and 2001, using Census 1996, 2001: Statistics South Africa.

The Theil index is another well-known measure of inequality. It has the desirable property of allowing national inequality to be decomposed into a contribution due to inequality within groups and a contribution due to inequality between groups.[4] This is a particularly interesting exercise given that we are reporting an increase in inequality within each group as well as in aggregate inequality. As discussed by Bhorat *et al.* (2000), the strong between-group component of inequality has always been the starkest marker of apartheid-driven inequality in South Africa. That said, Table 2 reproduces the findings of Whiteford and Van Seventer (2000) based on the Theil decomposition to show a declining share of between-group inequality over the period 1975 to 1996. The table also records our own calculations of between- and within-group shares of inequality for 1996 and 2001. These shares show a continuation of the decline in the between-group component over this recent period. In addition, using expenditure data from the 1995 and 2000 Income and Expenditure Surveys, Hoogeveen and Ösler (2005) do a similar decomposition and also find a decline

[4] See Bhorat *et al*. (2000) for a full explanation of such decompositions as well as a benchmarking against international results.

in between-group inequality from 1995 to 2000. Thus, the finding of recent declines in between-group inequality seems to be sound.

In the following three tables, we explore some additional dimensions of the racial composition of the South African income distribution. In Table 3, we report on income and population shares for each group from 1970 to 2001. The results from 1970 to 1996 are from Whiteford & Van Seventer (2000) and show that the share of income for the African group rises strongly from a very low base relative to population over the period 1970 to 1996. This corresponds to declining shares of income and population for the white group over the same period.

The table includes our estimates for 1996 and 2001. These show that the share of total income for Africans did not increase any further over this period. Rather, the white income share increased slightly. The lack of growth in the share of income attributed to Africans is striking when taking into account the growth of the total share of the African population. The slight growth in the share of white income is accompanied by a decrease in the population share of the white group. All in all, the 1996 and 2001 results suggest a break in the trend from 1970 to 1996.

Table 3: Income and population shares, 1970–2001

	Share of total income						**Share of population**					
	1970	**1980**	**1991**	**1996**	**1996**	**2001**	**1970**	**1980**	**1991**	**1996**	**1996**	**2001**
	Whiteford & Van Seventer estimates				**Our estimates**		**Whiteford & Van Seventer estimates**				**Our estimates**	
African	19.8%	24.9%	29.9%	35.7%	38%	38%	70.1%	72.4%	75.2%	76.2%	78%	80%
White	71.2%	65.0%	59.5%	51.9%	47%	48%	17.0%	15.5%	13.5%	12.6%	11%	9%
Coloured	6.7%	7.2%	6.8%	7.9%	9%	9%	9.4%	9.3%	8.7%	8.6%	9%	9%
Indian/ Asian	2.4%	3.0%	3.8%	4.5%	5%	6%	2.9%	2.8%	2.6%	2.6%	3%	3%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Sources: Whiteford & Van Seventer (2000) using 1970, 1975, 1980, 1991 and 1996 census data; own calculations for 1996 and 2001, using Census 1996, 2001: Statistics South Africa.
Note: Totals may not add up to 100% due to rounding.

We explore this further in Table 4, which reports on the ratios between mean white per capita income and the mean per capita income of other groups from 1970 to 2001. These ratios are known as disparity ratios. White per capita income increased from nine times higher than African income in 1996 to 11 times higher in 2001. This is a break in the trend from 1970 to 1996, which showed the disparity decreasing over these years. The disparity between coloured and white incomes also increased between 1996 and 2001, while the disparity ratio with Indians/Asians remained constant. Thus, as with the

movement of income shares by group, the movement of the disparity ratios between 1996 and 2001 contrasts with the decreasing inequality between 1970 and 1996.

Table 4: Disparity ratios: White to other population groups

	1970	1980	1991	1996	1996	2001
	Whiteford & Van Seventer estimates				**Our estimates**	
African	15.0	12.9	11.1	8.8	9.0	11.19
Coloured	6.0	5.3	5.7	4.5	4.3	5.26
Indian/Asian	5.1	3.9	3.0	2.3	2.3	2.39

Sources: Whiteford & Van Seventer (2000) using 1970, 1980, 1991 and 1996 census data; own calculations for 1996 and 2001, using Census 1996, 2001: Statistics South Africa.

To probe these two findings a little further, Table 5 explores the racial composition of income deciles in 1996 and in 2001. It shows that the percentage of Africans in the upper six deciles has increased between 1996 and 2001, with a marked increase of 7 per cent in the second highest decile since 1996. The share of African incomes in the lower deciles remains fairly constant over the period. Thus, this picture helps to explain some of the widening inequality within the African population, as shown earlier in our presentation of the changes in the Gini coefficients between 1996 and 2001.

Table 5: Population-group composition of per capita income deciles, 1996–2001

Decile	**African**		**White**		**Coloured**		**Indian/Asian**	
	1996	**2001**	**1996**	**2001**	**1996**	**2001**	**1996**	**2001**
1	97%	96%	0.4%	0.3%	3%	4%	0.2%	0.2%
2	95%	95%	1%	0.3%	4%	5%	0.4%	0.4%
3	93%	92%	1%	1%	6%	7%	0.4%	1%
4	89%	90%	1%	1%	10%	9%	1%	1%
5	84%	85%	2%	1%	13%	12%	2%	1%
6	79%	81%	3%	2%	15%	14%	3%	2%
7	72%	74%	5%	6%	18%	16%	5%	4%
8	63%	63%	12%	12%	17%	17%	7%	8%
9	43%	50%	35%	30%	14%	13%	8%	8%
10	21%	23%	67%	63%	6%	7%	5%	7%

Sources: Own calculations for 1996 and 2001, using Census 1996, 2001: Statistics South Africa.

The shares of whites in the bottom eight deciles remain constant between 1996 and 2001, with a decrease in the shares of the upper two deciles. The shares of

coloureds and Indians/Asians in all deciles remain fairly constant over the period. These group shares help to make it clear that the increase in the white share of income over the 1996–2001 period and the increase in the white/African disparity ratio were being driven by a few very high-earning whites at the top of the distribution. The general trend is still one in which there is notable upward mobility of Africans into the top sections of the income distribution. At the same time, there is no real evidence of downward mobility of whites, especially not into the lowest few deciles.

This section has focused on changes in inequality at the national level and by population group. The increases in inequality that we have detailed are supported by increased inequality within each province and across the rural/urban divide. However, we do not dwell on these two dimensions of changing inequality. Rather, we give the provinces and the rural/urban situation more detailed attention in the poverty analysis that follows.

3. Changing Patterns of Poverty

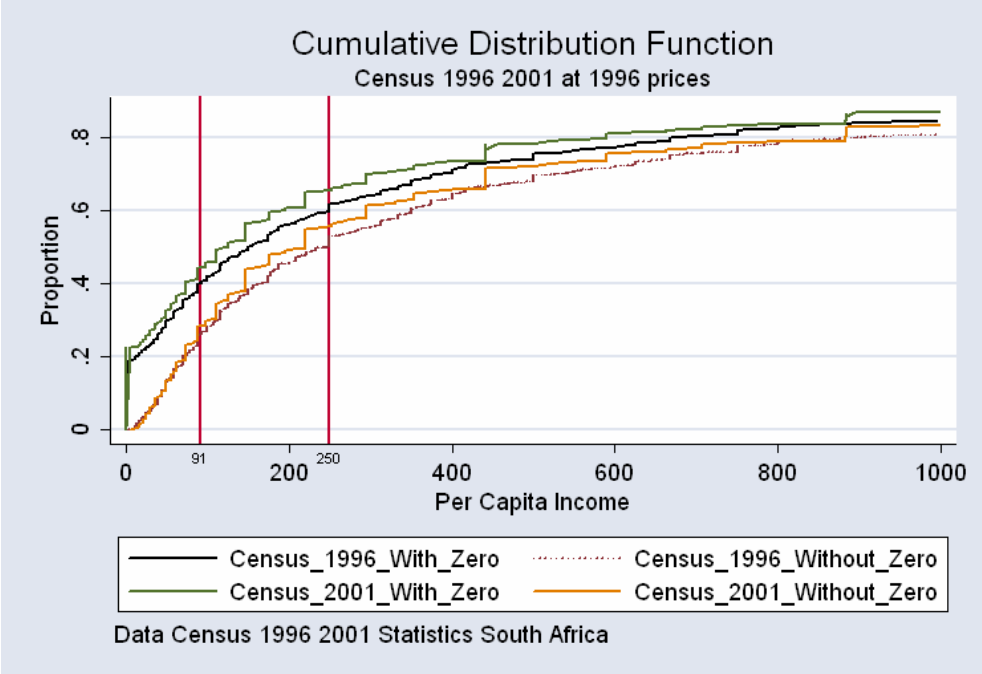
In this section, we focus exclusively on 'money-metric' poverty – that is, we focus on the amount of money income available to households to purchase the goods and services they require. Clearly, the experience of poverty is not exclusively about an absence of income, but we would argue that income poverty is a very significant dimension of poverty. In the next section (Section 4), we look at the advances that have been made in terms of other aspects of living standards such as access to clean water, decent housing and electrification. Despite general agreement that it is important to know what has happened to poverty levels since the end of apartheid, there is surprisingly little information currently available. In this brief section, we present the overarching trends that emerge from a comparison of the 1996 and 2001 censuses.

At the national level, the key figure is presented below. In this figure, we make real income comparisons between 1996 and 2001 by deflating the 2001 distribution to 1996 equivalents. We then graph a series of cumulative distribution functions (CDFs) for these comparable 1996 and 2001 incomes. On the vertical axis, these functions show the percentage of the population with a per capita income that is less than or equal to each real income level on the horizontal axis. As the per capita income level rises, so the corresponding percentage of the population must rise. The pattern of the increase in the proportion tells us a lot about poverty. A CDF that reaches high proportions very quickly tells us that a high proportion of the population has a low per capita income. In addition, a CDF plot that lies above another plot implies that, at any

per capita income level, a higher percentage of the population has that real per capita income or less; therefore, they would be measured as being poorer at any chosen poverty line.

In Figure 6, the 2001 CDF graphs lie above the 1996 CDF graphs at all points and this tells us that measured poverty worsened between 1996 and 2001 at any poverty line. However, the magnitude of such worsening is very sensitive to a number of assumptions. First, the fact that the 'with zero' graphs jump upwards shows how influential the distinction is between including and excluding the zero-income households from the analysis. As mentioned in the introduction, we generally exclude zero-income households from the analysis in this paper, under the assumption that income in these households is mis-measured. However, the exclusion of zero-income households clearly has a large impact on the measurement of poverty, given that we are dropping the ostensibly poorest observations from the data-set. Moreover, as we saw earlier, a higher percentage of the 2001 households report zero earnings. Thus, the inclusion of these households virtually guarantees that measured poverty will have worsened between 1996 and 2001.

Figure 6: National cumulative distribution functions at 1996 prices



The graphs that exclude the zero-income households show that the percentage of households earning less than or equal to the $2 per day poverty line is very similar for 1996 and 2001. However, by the R250 (1996 rands) poverty line,

there are more poor people in 2001 than in 1996. This evidence suggests that poverty worsened between 1996 and 2001 but that this worsening is not acute for the poorest of the poor.[5]

Table 6 shows this more precisely for the non-zero household case. Two poverty measures are used at the two poverty lines. The first is the headcount ratio – that is the number of the poor as a percentage of the total population at each poverty line. This headcount ratio increases from 1996 to 2001 for both poverty lines. The actual value of the headcount ratio can be read off Figure 6 as it corresponds exactly to the value on the vertical axis where the poverty line cuts the CDF graph for each year. Thus, it can be seen that the low poverty line ($2 per day/R91 per month) cuts the 1996 graph at 26 per cent and cuts the 2001 graph (in 1996 real income terms) at 28 per cent.

The second measure, the poverty gap ratio, records the average household's proportionate shortfall from the poverty line. For example, using R250 per person per month, the 1996 Census poverty gap ratio is 0.30. This means that the average household has an income that falls 30 per cent (0.30) short of this poverty line. In other words, the average household requires an additional R75 (0.30 X R250) for each of its members in order for that household to be classified as non-poor. This gap rises to 0.32 in 2001, reflecting the increase in measured poverty.

Table 6: National poverty levels, 1996 and 2001

	Headcount	**Poverty gap ratio**	**Headcount**	**Poverty gap ratio**
	1996		**2001**	
$2 per day	0.26	0.11	0.28	0.11
R250 (1996) per month	0.50	0.30	0.55	0.32

Sources: Own calculations for 1996 and 2001, using Census 1996, 2001: Statistics South Africa.

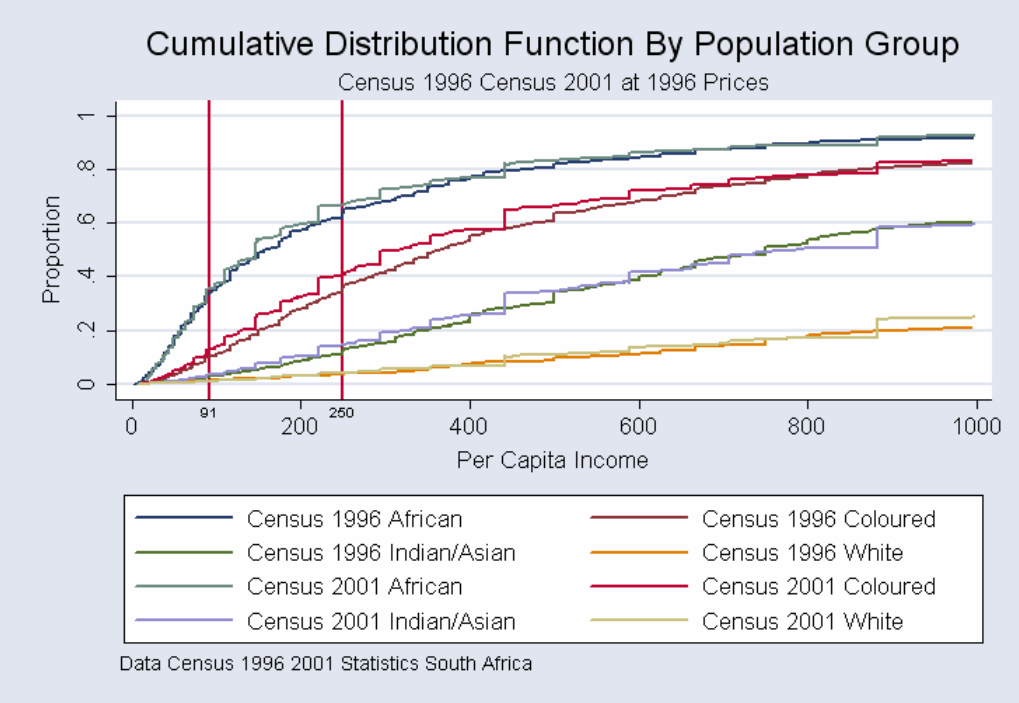
The next CDF plot (Figure 7) allows us to examine poverty rankings by population group in both 1996 and 2001, as well as how poverty changed for each group from 1996 to 2001. Looking exclusively at either the 1996 CDF plots by group or the 2001 CDF plots by group, a robust poverty ranking emerges. At any poverty line, Africans are very much poorer than coloureds, who are very much poorer than Indians/Asians, who are poorer than whites. The gaps between these graphs show the yawning differences between the groups in

[5] The rest of our poverty analysis is conducted exclusively in terms of the non-zero income households. All poverty calculations were also done using zero-income households and are available from the authors on request.

terms of absolute income levels. For example, the graphs stop at R1 000 per capita per month. More than 90 per cent, 80 per cent and 60 per cent of Africans, coloureds and Indians/Asians, respectively, have this real monthly income or less. The equivalent proportion of whites is just over 20 per cent.

This same CDF graph shows that measured poverty increased for Africans, coloureds and Indians/Asians, especially in the range between the two poverty lines. The increase in coloured poverty is especially stark. White poverty appears to be unchanged.

Figure 7: Cumulative distribution functions at 1996 prices by population group



Given that these CDF plots do not cross at low income levels, the poverty rankings and changes over time are unambiguous and will be reflected in any acceptable poverty measure. Table 7 assesses this by measuring poverty for each population group in 1996 and 2001, using both the headcount poverty measure and the poverty gap ratio. These poverty measures confirm the group rankings of poverty and the large group differences in measured poverty at either poverty line. They also confirm that there were only small increases in poverty between 1996 and 2001 for Africans and coloureds when measured at the low poverty line ($2 per day) but fairly large increases in poverty for these two groups and the Indian/Asian group when the higher poverty line (R250) is used.

Table 7: Poverty levels by population group

	Headcount	Poverty gap ratio	Headcount	Poverty gap ratio
Poverty line	**1996**		**2001**	
$2 per day				
African	0.34	0.14	0.35	0.14
Coloured	0.10	0.03	0.13	0.04
Indian/Asian	0.03	0.01	0.03	0.01
White	0.01	0.00	0.01	0.00
R250 (1996)				
African	0.62	0.38	0.67	0.39
Coloured	0.34	0.16	0.41	0.19
Indian/Asian	0.11	0.05	0.14	0.06
White	0.03	0.02	0.04	0.02

Sources: Own calculations for 1996 and 2001, using Census 1996, 2001: Statistics South Africa.

Table 8: Poverty shares by population group

	Headcount	Poverty gap ratio	Headcount	Poverty gap ratio
Poverty line	**1996**		**2001**	
$2 per day				
African	0.95	0.96	0.95	0.95
Coloured	0.04	0.03	0.05	0.04
Indian/Asian	0.00	0.00	0.00	0.00
White	0.01	0.00	0.00	0.00
R250 (1996)				
African	0.91	0.93	0.91	0.93
Coloured	0.07	0.06	0.08	0.06
Indian/Asian	0.01	0.00	0.01	0.01
White	0.01	0.01	0.01	0.01

Sources: Own calculations for 1996 and 2001, using Census 1996, 2001: Statistics South Africa.

One of the strengths of the headcount ratio and the poverty gap ratio as measures of poverty is that they can both be used to generate poverty shares to complement the poverty rates such as those reflected in Table 7 above. These poverty shares are derived by weighting the poverty rates of each subgroup (population groups in this case) by the share of the population that belongs to each subgroup. These poverty shares are shown in Table 8. We have already seen that the African group has by far the highest poverty rates. When this is combined with their dominant population share, the result is the overwhelming African poverty shares that are reflected in Table 8. One subtlety reflected in the table is that this African share is higher for the poverty gap ratio than for the

headcount ratio. This is due to the fact that the poverty gap ratio accounts for how far a person's income is below the poverty line and not merely whether or not the person is poor. The African poor are over-represented in the poorest of the poor group, and the poverty gap ratio reflects this as a higher percentage of poverty.

We introduce our discussion of provincial poverty through Figures 8, 9 and 10. Figures 8 and 9 allow us to examine provincial poverty rankings for each province for both 1996 and 2001. The CDF graphs show that for the best-off and worst-off provinces, these rankings are unchanged over time. In both years, the Western Cape and Gauteng have the lowest poverty rates, while the Eastern Cape and Limpopo have the highest poverty rates, regardless of where we draw the poverty line.

Figure 10 focuses exclusively on the two richest provinces (the Western Cape and Gauteng) and the two poorest provinces (the Eastern Cape and Limpopo). This is useful in highlighting the magnitude of the differences in poverty between the richest and poorest provinces. In addition, as it presents comparable real income values for both 1996 and 2001 for each of these four provinces, it can show changes in poverty over time. There is evidence of an increase in poverty in all of the provinces, including the two best-off provinces. This increase is particularly marked for real income levels between the low poverty line and the higher line and less marked for incomes below the low poverty line.

Figure 8: Cumulative distribution functions, without zero incomes, by province for Census 2001

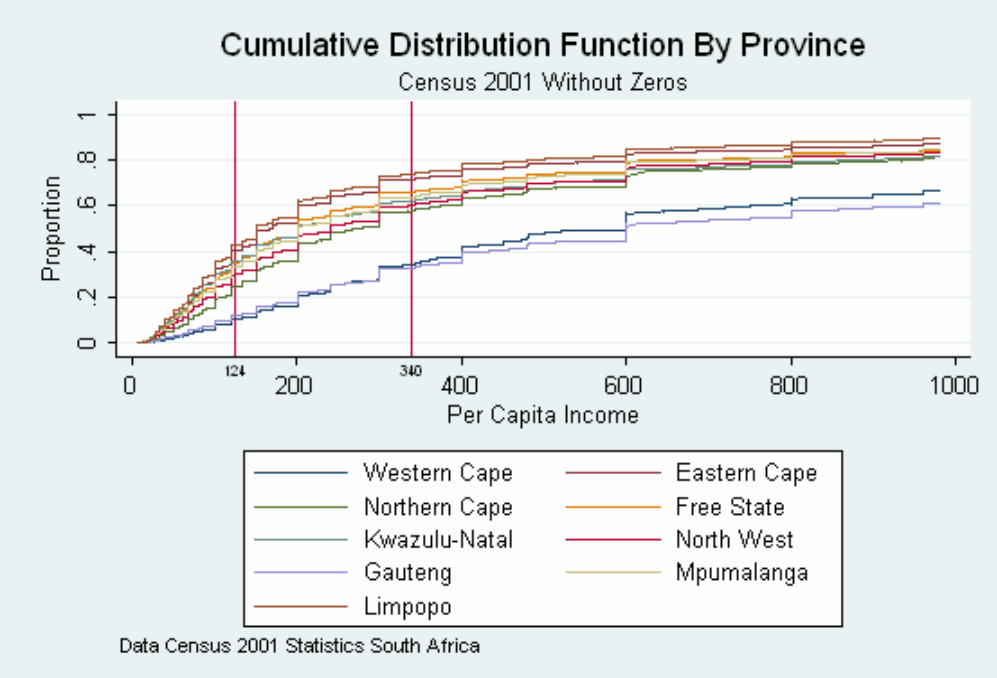


Figure 9: Cumulative distribution functions, without zero incomes, by province for Census 1996

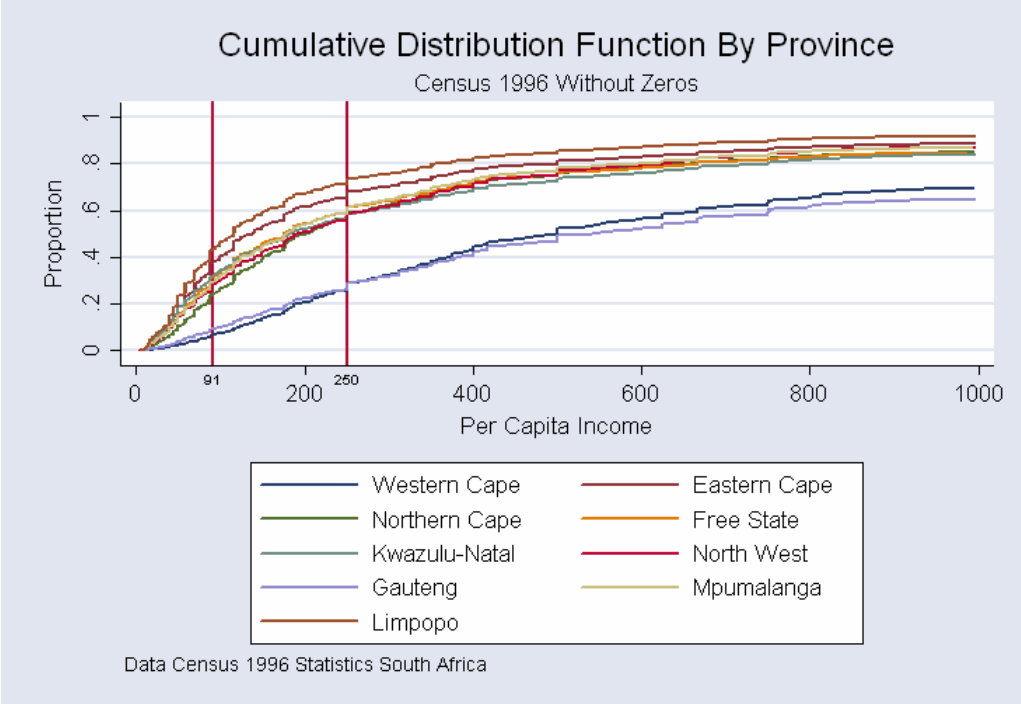


Figure 10: Cumulative distribution functions, without zero incomes, richest and poorest provinces for Census 1996 and 2001

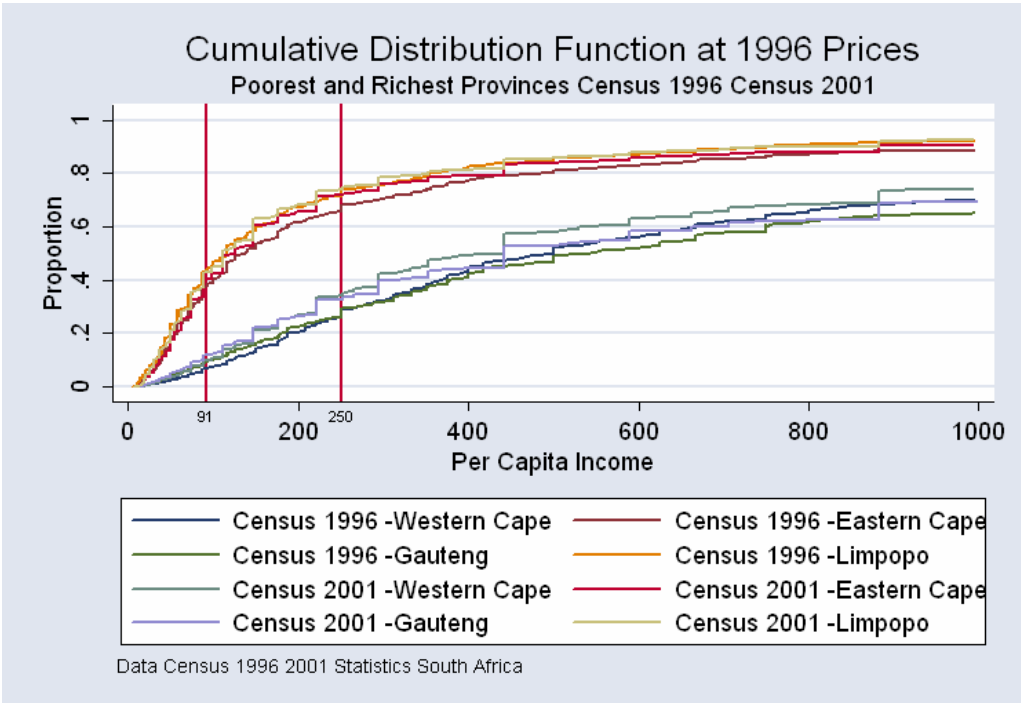


Table 9 confirms these provincial poverty profiles at the two selected poverty lines. In spite of excluding zero incomes (which, if included, would severely worsen the results), the poverty rates in the Eastern Cape, Free State, Limpopo, Mpumalanga and KwaZulu-Natal are all in excess of 30 per cent, even at the extremely low poverty line of $2 per day.

Table 9: Poverty levels by province, excluding zero incomes

	Headcount	**Poverty gap ratio**	**Headcount**	**Poverty gap ratio**
Poverty line	**1996**		**2001**	
$2 per day				
Western Cape	0.07	0.02	0.10	0.03
Eastern Cape	0.38	0.15	0.40	0.15
Northern Cape	0.24	0.09	0.24	0.09
Free State	0.32	0.13	0.35	0.15
KwaZulu-Natal	0.32	0.15	0.36	0.15
North West	0.28	0.12	0.30	0.12
Gauteng	0.09	0.04	0.12	0.04
Mpumalanga	0.30	0.13	0.33	0.14
Limpopo	0.44	0.19	0.43	0.18
R250 (1996)				
Western Cape	0.26	0.11	0.34	0.15
Eastern Cape	0.65	0.41	0.72	0.43
Northern Cape	0.57	0.31	0.58	0.31
Free State	0.59	0.35	0.66	0.39
KwaZulu-Natal	0.56	0.35	0.62	0.38
North West	0.56	0.33	0.60	0.34
Gauteng	0.26	0.13	0.33	0.16
Mpumalanga	0.59	0.35	0.64	0.38
Limpopo	0.71	0.46	0.74	0.46

Sources: Own calculations for 1996 and 2001, using Census 1996, 2001: Statistics South Africa.

While it is clearly useful to know in which provinces the poverty rates are highest, it is also constructive to interrogate which provinces have the largest numbers of poor people. Table 10 shows the proportion of the poor living in each province. For example, using the lower poverty line, we find that 20 per cent of the poor live in the Eastern Cape and 25 per cent of the poor live in KwaZulu-Natal. Generally, the provincial poverty shares are quite stable across the two poverty lines and across time. The most notable change is the fact that the two poorest provinces appear to have given up small shares of poverty to the two richest provinces between 1996 and 2001. Such a change in the shares

would be consistent with a migration of poor South Africans from these very poor provinces to the better-off provinces.

Table 10: Poverty shares by province, excluding zero incomes

	Headcount	**Poverty gap ratio**	**Headcount**	**Poverty gap ratio**
Poverty line	**1996**		**2001**	
$2 per day				
Western Cape	0.03	0.02	0.04	0.03
Eastern Cape	0.20	0.19	0.18	0.17
Northern Cape	0.02	0.02	0.02	0.02
Free State	0.08	0.08	0.08	0.08
KwaZulu-Natal	0.25	0.26	0.26	0.27
North West	0.09	0.09	0.09	0.09
Gauteng	0.07	0.06	0.09	0.08
Mpumalanga	0.08	0.08	0.08	0.08
Limpopo	0.17	0.18	0.17	0.17
R250 (1996)				
Western Cape	0.06	0.04	0.07	0.05
Eastern Cape	0.18	0.19	0.17	0.18
Northern Cape	0.03	0.02	0.02	0.02
Free State	0.08	0.08	0.08	0.08
KwaZulu-Natal	0.23	0.24	0.23	0.24
North West	0.09	0.09	0.09	0.09
Gauteng	0.10	0.09	0.12	0.11
Mpumalanga	0.08	0.08	0.08	0.08
Limpopo	0.15	0.16	0.15	0.16

Sources: Own calculations for 1996 and 2001, using Census 1996, 2001: Statistics South Africa.

We complete our discussion of income poverty by comparing rural and urban poverty. The rural-urban divide cuts across population group and province. Figure 11 shows that rural poverty rates are substantially higher than urban poverty rates (regardless of the poverty line we choose). The graph also demonstrates that poverty rates unambiguously increased in urban areas over the inter-censal period, while this cannot be unequivocally concluded for rural areas.

Table 11 confirms that at the two poverty lines that we use throughout this paper, poverty in both rural and urban areas increased over the 1996 to 2001 period. This increase is marked at the higher poverty line. The increase in urban poverty resonates with our earlier finding that poverty increased in Gauteng and in the Western Cape. In this context it is interesting to note that poverty also increased in KwaZulu-Natal.

Figure 11: Urban and rural cumulative distribution functions at 1996 prices, Census 1996 and 2001

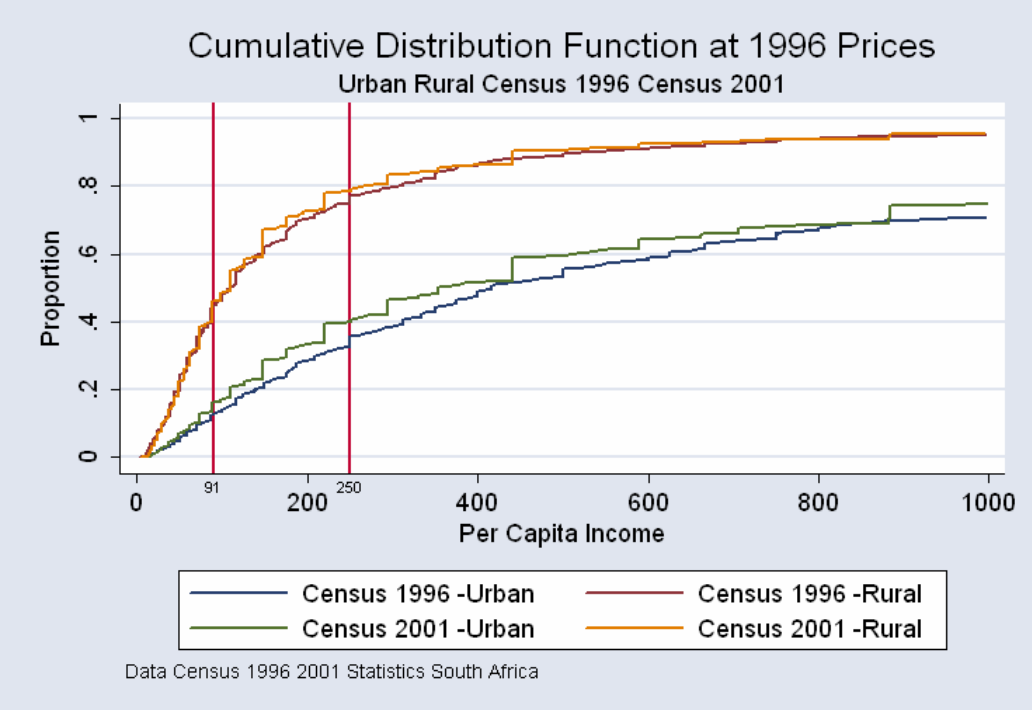


Table 11: Urban and rural poverty levels

	Headcount	**Poverty gap ratio**	**Headcount**	**Poverty gap ratio**
Poverty line	**1996**		**2001**	
$2 per day				
Urban	0.13	0.05	0.16	0.06
Rural	0.45	0.19	0.46	0.19
R250 (1996)				
Urban	0.36	0.17	0.40	0.21
Rural	0.75	0.48	0.79	0.49

Sources: Own calculations for 1996 and 2001, using Census 1996, 2001: Statistics South Africa.

Table 12 throws further light on this issue. While a much higher proportion of the rural population are poor, the proportion of the poor who are in rural areas is declining. Using the higher poverty line, 38 per cent of the poor were in urban areas in 1996, whereas 43 per cent of the poor were in urban areas in 2001. This is to be expected, given that a significant amount of rural to urban migration occurred over the period.

Table 12: Urban and rural poverty shares

	Headcount	Poverty gap ratio	Headcount	Poverty gap ratio
Poverty line	**1996**		**2001**	
$2 per day				
Urban	0.29	0.28	0.34	0.32
Rural	0.71	0.72	0.66	0.68
R250 (1996)				
Urban	0.38	0.34	0.43	0.39
Rural	0.62	0.66	0.57	0.61

Sources: Own calculations for 1996 and 2001, using Census 1996, 2001: Statistics South Africa.

4. Changing Patterns of Access Poverty and Inequality

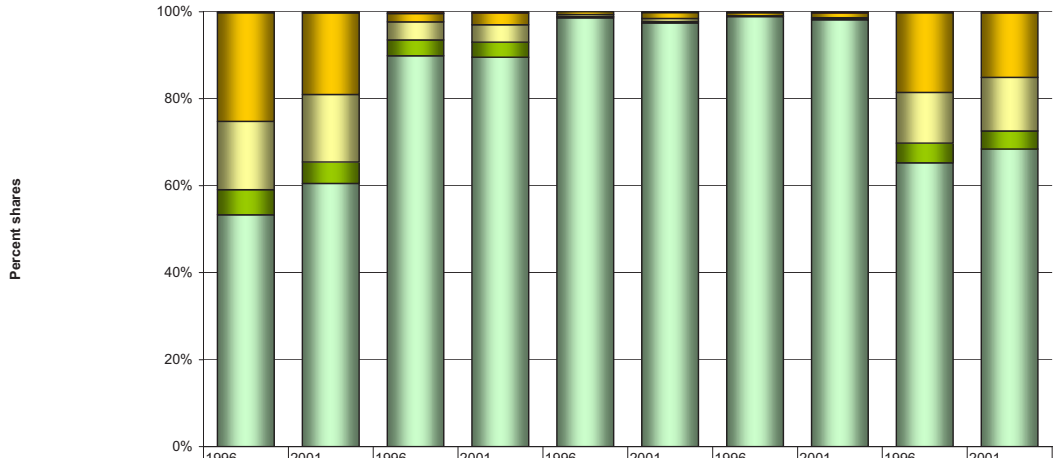
A comprehensive analysis of well-being stretches beyond the assessment of poverty and inequality based on income measures to include other key indicators of living standards, which may not be fully accounted for using only the income approach. Access to basic services such as clean water, electricity and sanitation also has a major impact on quality of life, leading to improvements ranging from health to productivity. In this section we consider the types of dwelling that households occupy and access to basic services as further indicators of poverty and inequality. The shifts in measures are explored for the inter-censal period to see where gains have been made or setbacks experienced. The analysis is done at the national, population group, provincial and rural-urban levels.

Dwelling

Having adequate shelter is a basic necessity. From Census 1996 and Census 2001 we have identified four categories of dwelling – formal, informal in backyard, informal not in backyard (such as a squatter camp) and traditional. Formal dwellings are viewed as superior, more permanent fixtures with walls made of bricks or concrete, and tiled or corrugated iron roofs. Generally, informal dwellings have corrugated iron walls and roofs, whilst traditional dwellings are made of mud walls and an equal share of corrugated iron and thatch roofs. In terms of structural quality and overcrowding, informal dwellings appear to be most vulnerable to shocks such as adverse weather conditions or spreading fires within densely populated locations. Informal dwellings are more

vulnerable than traditional dwellings with regards to the condition of the dwellings' roofs and walls, thus rendering informal dwellings more susceptible to damage.

Figure 12: Type of dwelling by population group, 1996 and 2001



	African		Coloured		Indian/Asian		White		National	
	1996	2001	1996	2001	1996	2001	1996	2001	1996	2001
Other	0.2	0.3	0.4	0.3	0.0	0.2	0.2	0.3	0.2	0.3
Traditional	25.0	18.5	1.9	2.7	0.6	1.4	0.7	1.1	18.3	14.6
Informal not in backyard	15.7	15.3	4.2	3.9	0.5	0.7	0.1	0.3	11.7	12.2
Informal in backyard	5.8	4.9	3.6	3.4	0.3	0.3	0.1	0.2	4.5	4.1
Formal	53.3	59.7	89.9	88.5	98.6	96.6	98.9	97.0	65.2	67.6

Source: Census 1996; Census 2001 (own calculations).
Note: Totals may not add up to 100 due to omission of unspecified category.

Nationally, it is evident that in both 1996 and 2001, almost two-thirds of households occupied formal dwellings. During the inter-censal period, the proportion of households living in traditional dwellings decreased from approximately 18.3 per cent in 1996 to 14.6 per cent in 2001. Figure 12 shows that for both 1996 and 2001 more than 90 per cent of coloureds, Indians/Asians and whites lived in formal dwellings, whilst the proportion of Africans living in formal dwellings rose from 53 per cent in 1996 to 60 per cent in 2001. The increase in the proportion of Africans living in formal dwellings was offset by a decrease in the proportion of Africans living in traditional housing.

Furthermore, if we examine dwelling types on a provincial level, we see that during the inter-censal period, the proportion of households occupying formal dwellings increased in almost all provinces, especially in Limpopo where the proportion of households occupying formal dwellings increased by 10 per cent during the period. It is important to note that Limpopo, which is classified from census data as the poorest province in terms of income deprivation, has seen the largest increase in the proportion of households residing in formal dwellings, and the share of households residing in such dwellings in the province rivals

those of the least poor provinces (for example, Gauteng and the Western Cape). The picture for the Eastern Cape, however, is consistent with the income poverty measures for this province. It performs most poorly in terms of access to formal dwellings, with only half of households residing in such homes, and more than one in three in traditional dwellings. Although the performance of Limpopo seems quite extraordinary, given both its income poverty and rural nature, it must be noted that the majority of dwellings classified as formal in this province are simple shells with brick walls and corrugated iron or zinc roofs, and which will scarcely be found with a flush or chemical toilet.

Table 13: Type of dwelling by province, 1996 and 2001

(a) 1996

Province	Formal	Informal in backyard	Informal not in backyard	Traditional	Other	Total
Western Cape	82.2	3.4	13.3	0.9	0.2	100.0
Eastern Cape	47.4	2.3	8.6	41.4	0.3	100.0
Northern Cape	80.9	2.7	11.4	4.0	1.0	100.0
Free State	63.3	8.1	18.3	10.2	0.1	100.0
KwaZulu-Natal	56.1	2.7	8.6	32.4	0.2	100.0
North West	70.5	6.4	16.0	7.0	0.1	100.0
Gauteng	74.9	8.0	16.2	0.7	0.1	100.0
Mpumalanga	65.9	4.1	11.7	18.1	0.2	100.0
Limpopo	62.8	1.6	3.3	32.2	0.2	100.0
Total	65.2	4.5	11.7	18.3	0.2	100.0

(b) 2001

Province	Formal	Informal in backyard	Informal not in backyard	Tra-ditional	Other	Un-specified	Total
Western Cape	80.4	4.0	12.1	2.1	0.3	1.2	100.0
Eastern Cape	50.2	2.1	8.9	37.8	0.2	0.9	100.0
Northern Cape	82.3	2.7	9.8	3.1	0.7	1.4	100.0
Free State	64.7	5.8	19.8	7.1	0.2	2.4	100.0
KwaZulu-Natal	60.1	2.3	8.4	27.5	0.3	1.4	100.0
North West	71.2	5.6	16.5	5.2	0.2	1.3	100.0
Gauteng	73.4	6.9	16.8	1.3	0.3	1.4	100.0
Mpumalanga	69.9	3.3	12.5	12.9	0.3	1.1	100.0
Limpopo	72.7	1.8	4.7	19.7	0.2	0.9	100.0
Total	67.6	4.1	12.2	14.6	0.3	1.3	100.0

Source: Census 1996; Census 2001 (own calculations).

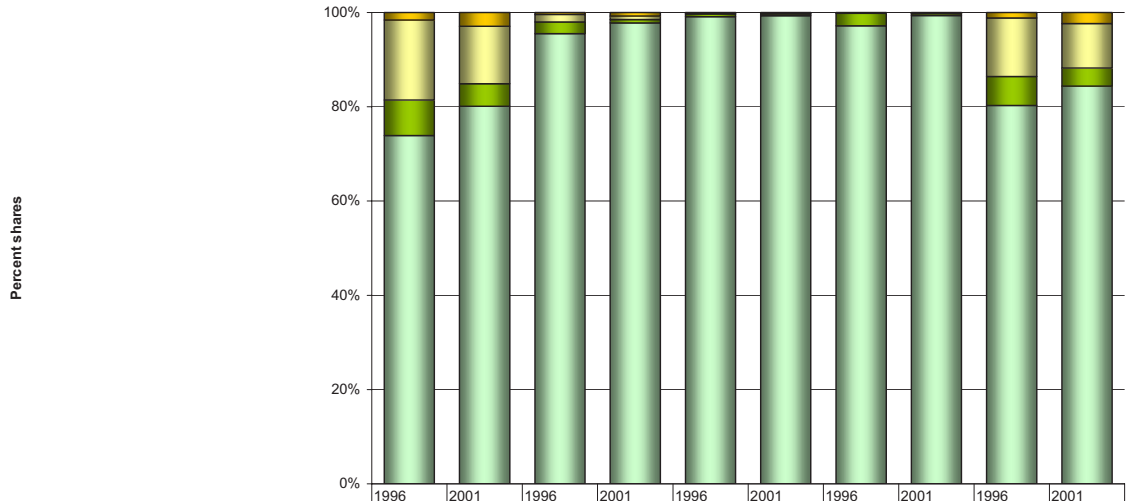
Table 13 shows that for both 1996 and 2001, approximately three-quarters of urban households and more than half of rural households resided in formal dwellings. Informal settlements (squatter camps) are more prevalent in the urban

areas of the Free State, North West and Mpumalanga. As would be expected, traditional dwellings are more common in rural areas, especially in KwaZulu-Natal and the Eastern Cape, where more than 50 per cent and 60 per cent of households, respectively, reside in traditional dwellings. For rural areas, there has been a marked decrease in the proportion of households occupying traditional dwellings, from 43 per cent to 35 per cent. It is reassuring to note that this decrease was largely offset by an increase in formal dwellings as opposed to an increase in the more vulnerable informal dwellings.

Water

Traditionally, people in poorer areas spend much time collecting water of varying quality from sources a great distance from their homes. A constant supply of clean water close to the home positively contributes to a household's well-being by promoting good health and freeing up time for alternative activities. The inter-censal period shows an increase in the proportion of households with access to piped water, and a subsequent reduction in the proportion of households using water from dams, rivers and springs. In South Africa more than four out of every five households have access to piped water, be it in the home or outside the home.

Figure 13: Access to water by population group, 1996 and 2001



	African		Coloured		Indian/Asian		White		National	
	1996	2001	1996	2001	1996	2001	1996	2001	1996	2001
Other	1.6	2.9	0.4	0.7	0.1	0.2	0.0	0.2	1.2	2.3
Dam/river/stream/spring	16.9	11.9	1.6	0.8	0.2	0.1	0.2	0.1	12.4	9.2
Borehole/rain-water tank/well/water-carrier/tanker	7.5	4.7	2.5	0.7	0.6	0.3	2.6	0.4	6.1	3.7
Piped	73.6	78.3	95.4	94.7	98.9	95.7	96.9	95.8	80.0	82.2

Source: Census 1996; Census 2001 (own calculations).
Note: Totals may not add up to 100 due to omission of unspecified category.

The statistics for access to piped water shown in Figure 13 are encouraging; however, there remains a significant proportion of African households who in 2001 were still reliant on dams, rivers and springs as their main source of water for domestic use.

On a provincial level, as illustrated in Table 14, we see that yet again the income-poor Eastern Cape lags behind the other provinces in terms of access to piped water. Almost a third of households in the Eastern Cape obtain their water from dams, rivers and springs. The reliance of Eastern Cape households on water from dams, rivers and springs is particularly evident in the rural areas where more than half of households obtain their water from these sources.

Table 14: Access to water by province, 1996 and 2001

(a) 1996

Province	Piped	Borehole/rain-water tank/well/ water-carrier/ tanker	Dam/river /stream/ spring	Other	Un-specified	Total
Western Cape	97.0	1.2	0.6	1.0	0.2	100.0
Eastern Cape	53.6	4.7	40.7	0.6	0.5	100.0
Northern Cape	91.4	5.0	3.0	0.4	0.3	100.0
Free State	94.1	4.0	0.9	0.7	0.3	100.0
KwaZulu-Natal	66.4	7.8	24.4	0.9	0.4	100.0
North West	81.4	13.2	1.7	3.2	0.4	100.0
Gauteng	96.2	2.7	0.1	0.6	0.4	100.0
Mpumalanga	82.3	10.1	5.6	1.5	0.5	100.0
Northern Province	75.6	10.7	11.1	2.2	0.5	100.0
Total	80.0	6.1	12.4	1.2	0.4	100.0

(b) 2001

Province	Piped	Borehole/rain-watertank/well/ water-carrier/ tanker	Dam/river/ stream/ spring	Other	Un-specified	Total
Western Cape	94.9	0.3	0.4	1.0	3.4	100.0
Eastern Cape	61.0	4.2	31.3	1.4	2.1	100.0
Northern Cape	94.8	0.8	1.4	1.2	1.9	100.0
Free State	93.6	1.0	0.5	2.8	2.1	100.0
KwaZulu-Natal	70.5	5.7	18.1	2.4	3.3	100.0
North West	84.9	9.0	1.1	3.4	1.5	100.0
Gauteng	94.4	0.7	0.2	1.6	3.1	100.0
Mpumalanga	84.9	4.4	4.9	3.8	2.0	100.0
Limpopo	76.9	7.4	10.4	4.0	1.2	100.0
Total	82.2	3.7	9.2	2.3	2.5	100.0

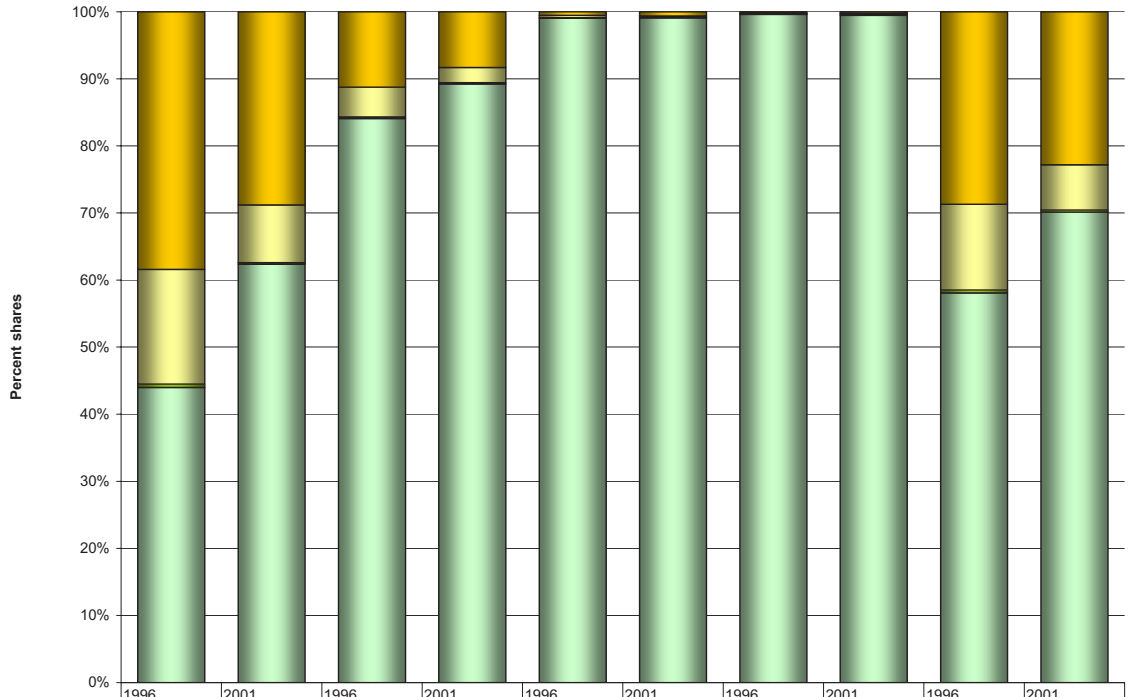
Source: Census 1996; Census 2001 (own calculations).

It is interesting to note that although Limpopo is one of the poorest provinces in terms of income, it fares quite well with regards to access to piped water, with approximately three-quarters of households having access to piped water, even in the rural areas. More importantly, the proportion of households in KwaZulu-Natal with access to piped water is less than in Limpopo. Although there has been an increase in the proportion of households with access to piped water during the inter-censal period, less than half of rural KwaZulu-Natal households obtain their water from this source. Thus, the outbreak of waterborne diseases, such as cholera, in these rural regions is not surprising. Clearly, there is room for much improvement in terms of household access to piped water.

Energy for Lighting

Electricity is viewed as the most desirable form of energy and is required for the functioning of various household assets, such as refrigerators and computers.

Figure 14: Energy for lighting by population group, 1996 and 2001



	African		Coloured		Indian/Asian		White		National	
	1996	2001	1996	2001	1996	2001	1996	2001	1996	2001
Candles	38.1	28.5	11.2	8.2	0.5	0.6	0.2	0.3	28.5	22.6
Paraffin	17.0	8.5	4.4	2.2	0.3	0.2	0.1	0.1	12.7	6.7
Gas	0.5	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.4	0.3
Electricity	43.7	61.6	83.7	88.3	98.7	98.4	99.0	98.3	57.7	69.5

Source: Census 1996; Census 2001 (own calculations).
Note: Totals may not add up to 100 due to omission of other and unspecified category.

However, poorer households often lack the means to access electricity (due to lack of either infrastructure or income), and thus find themselves using other forms of energy such as wood, paraffin and candles. Nationally, from 1996 to 2001, there has been a significant increase of more than ten percentage points in the proportion of households with access to electricity for lighting purposes. The success of the electrification programme had specific ramifications for the African population for whom, in 1996, only two in five households used electricity for lighting. In 2001 this number had increased substantially to every three in five households, as illustrated in Figure 14. Notwithstanding the improvements, the racial discrepancies remain clear with almost one-third of African households reliant on candles in 2001, compared with 8 per cent of coloured and a negligible proportion of white and Indian/Asian households.

Table 15: Energy for lighting by province, 1996 and 2001

(a) 1996

Province	Electricity	Gas	Paraffin	Candles	Other	Unspecified	Total
Western Cape	85.4	0.3	8.2	5.8	0.0	0.4	100.0
Eastern Cape	31.7	0.6	38.8	28.4	0.0	0.6	100.0
Northern Cape	71.0	0.2	7.6	20.6	0.1	0.4	100.0
Free State	57.3	0.2	7.3	34.7	0.0	0.4	100.0
KwaZulu-Natal	53.7	0.5	5.2	40.0	0.0	0.7	100.0
North West	44.1	0.3	6.9	48.2	0.6	0.0	100.0
Gauteng	79.8	0.2	2.4	16.9	0.0	0.7	100.0
Mpumalanga	56.5	0.8	10.5	31.3	0.0	0.8	100.0
Limpopo	36.8	0.6	24.7	37.0	0.0	0.9	100.0
Total	57.7	0.4	12.7	28.5	0.0	0.6	100.0

(b) 2001

Province	Electricity	Gas	Paraffin	Candles	Other	Unspecified	Total
Western Cape	87.5	0.3	7.0	4.4	0.1	0.7	100.0
Eastern Cape	49.5	0.4	23.4	25.8	0.1	1.0	100.0
Northern Cape	76.4	0.2	3.9	18.4	0.4	0.8	100.0
Free State	74.4	0.2	4.7	20.2	0.1	0.5	100.0
KwaZulu-Natal	61.2	0.4	2.5	34.8	0.1	1.1	100.0
North West	70.2	0.1	3.1	26.1	0.1	0.5	100.0
Gauteng	80.4	0.2	2.9	15.8	0.0	0.8	100.0
Mpumalanga	67.9	0.3	4.2	26.7	0.1	0.8	100.0
Limpopo	63.7	0.2	7.6	27.4	0.1	1.0	100.0
Total	69.5	0.3	6.7	22.6	0.1	0.9	100.0

Source: Census 1996; Census 2001 (own calculations).

Stark provincial disparities in 1996 were somewhat smoothed by 2001. As in the case of formal housing and piped water, the income-poor Eastern Cape is the most deprived province with only half of households having access to electricity for lighting. It is interesting to note that the main alternative to electricity in most provinces is candles, but that in the Eastern Cape paraffin is also a major

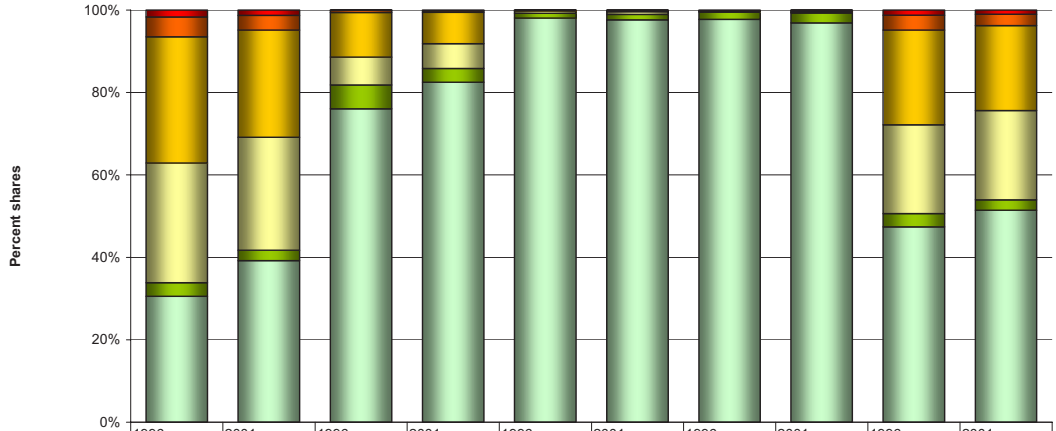
source of energy for lighting, and is used by just under a quarter of households. In Limpopo even greater successes in the electrification programme have been achieved; compared with five years earlier, an additional 25 per cent of households had access to electricity in 2001, with electricity largely replacing paraffin.

In 1996, less than a third of rural households had access to electricity, but in 2001 approximately half of rural households used electricity for lighting, implying potential improvements in the standard of living in these more deprived areas.

Energy for Cooking

The alternative sources of energy for cooking purposes are different to those for lighting purposes, and include electricity, gas, paraffin, wood, coal and animal dung. Furthermore, the choice between energy sources will be dependent largely on the cost, availability and effectiveness of the energy source to perform the given task and the asset available for cooking (for example, type of stove).

Figure 15: Energy for cooking by population group, 1996 and 2001



	African		Coloured		Indian/Asian		White		National	
	1996	2001	1996	2001	1996	2001	1996	2001	1996	2001
Animal dung	1.6	1.2	0.1	0.1	0.0	0.1	0.0	0.1	1.2	1.0
Coal	4.8	3.5	0.5	0.4	0.0	0.1	0.1	0.1	3.6	2.7
Wood	30.4	25.6	10.8	7.5	0.2	0.2	0.2	0.3	22.9	20.3
Paraffin	28.9	27.0	6.7	5.9	0.5	0.6	0.1	0.2	21.5	21.3
Gas	3.3	2.5	5.8	3.3	1.1	1.3	1.8	2.4	3.2	2.5
Electricity	30.4	38.6	75.6	81.0	97.7	95.7	97.3	94.8	47.2	50.6

Source: Census 1996; Census 2001 (own calculations).
Note: Totals may not add up to 100 due to omission of other and unspecified category.

Even though there have been large increases in the reach of electricity used for lighting purposes, this has corresponded to only a three percentage point

increase in the proportion of households using electricity for cooking purposes. In 2001, only half of South African households used electricity as the main source of energy for cooking purposes. Furthermore, we see that only two in every five African households use electricity, while more than half of all African households are reliant on either paraffin or wood for cooking. Indeed, of our indicators examined thus far, it appears that fuel used for cooking is most closely linked to income status. The inequalities in access across provinces can be clearly seen in table 16.

Table 16: Energy for cooking by province, 1996 and 2001

(a) 1996

Province	Electricity	Gas	Paraffin	Wood	Coal	Animal dung	Other	Un-specified	Total
Western Cape	76.8	4.9	13.3	4.5	0.1	0.0	0.0	0.4	100.0
Eastern Cape	23.3	3.3	29.4	37.9	0.3	5.4	0.0	0.5	100.0
Northern Cape	52.5	9.6	17.5	18.5	1.4	0.1	0.0	0.5	100.0
Free State	42.1	4.0	35.6	9.2	7.1	1.5	0.0	0.5	100.0
KwaZulu-Natal	46.0	3.2	17.9	29.5	2.3	0.6	0.0	0.5	100.0
North West	33.7	4.7	36.8	20.6	2.9	0.9	0.0	0.4	100.0
Gauteng	73.1	1.7	19.4	0.9	4.3	0.0	0.0	0.6	100.0
Mpumalanga	35.5	2.4	17.3	25.9	17.8	0.5	0.0	0.6	100.0
Limpopo	19.5	1.7	12.2	63.3	2.2	0.5	0.0	0.5	100.0
Total	47.2	3.2	21.5	22.9	3.6	1.2	0.0	0.5	100.0

(b) 2001

Province	Electricity	Gas	Paraffin	Wood	Coal	Animal dung	Other	Un-specified	Total
Western Cape	77.6	3.4	13.9	2.9	0.2	0.3	0.2	1.6	100.0
Eastern Cape	27.6	2.9	29.3	35.6	0.3	3.3	0.3	0.7	100.0
Northern Cape	58.5	6.5	17.8	15.5	0.5	0.2	0.1	0.9	100.0
Free State	46.4	3.4	33.9	7.9	5.4	1.6	0.2	1.3	100.0
KwaZulu-Natal	47.3	3.0	17.9	26.7	2.0	1.0	0.4	1.8	100.0
North West	44.0	2.9	32.1	18.2	1.1	0.9	0.1	0.7	100.0
Gauteng	72.1	1.4	21.3	0.7	2.7	0.2	0.2	1.4	100.0
Mpumalanga	39.4	1.9	17.3	23.2	16.0	0.8	0.3	1.1	100.0
Limpopo	24.7	1.7	11.0	59.3	1.6	0.4	0.3	0.9	100.0
Total	50.7	2.5	21.3	20.3	2.7	1.0	0.2	1.3	100.0

Source: Census 1996; Census 2001 (own calculations).

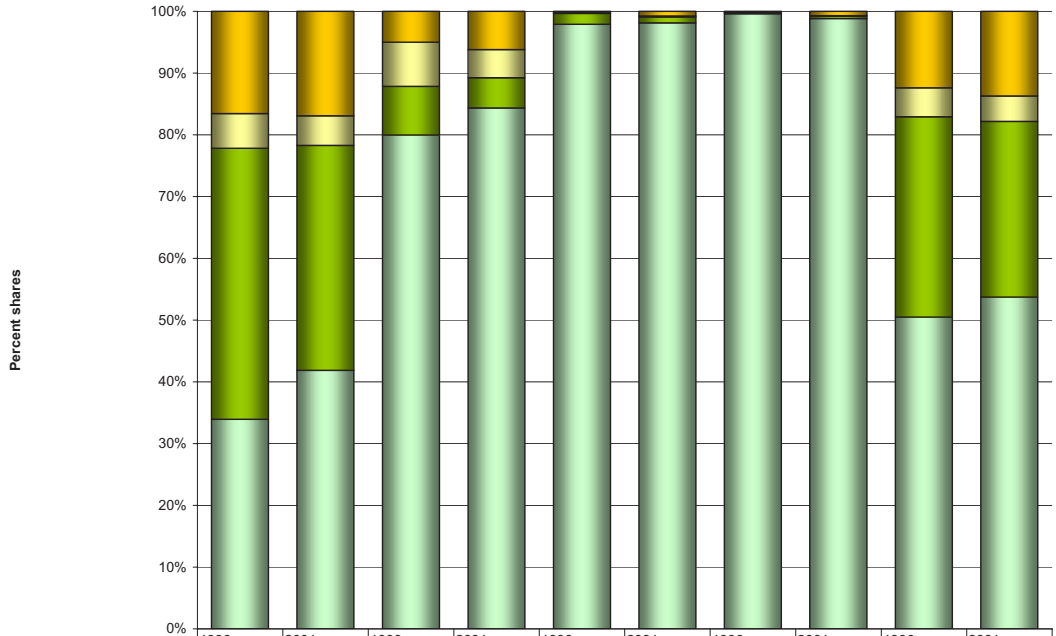
The financial constraints of households in Limpopo and the Eastern Cape are apparent in that they once again lag behind the other provinces with regards to access to electricity. In the rural areas of Limpopo, less than one in five households use electricity for cooking purposes, and more than two-thirds are reliant on often freely available wood. Rural households in the Eastern Cape appear to be worse off than their counterparts in Limpopo, with less than one in ten households using electricity for cooking. More than half of rural households

use wood for cooking purposes. However, in urban areas where wood is not readily accessible, households are mainly reliant on electricity and paraffin. As such, poorer urban households are forced to use their little wealth to pay for this energy source. They become especially vulnerable to fluctuations in the price of paraffin, which swings greatly with changes in the oil price.

Sanitation

During the inter-censal period, there was an increase in the proportion of households with access to a flush or chemical toilet. However, in 2001 a little more than half of the households in the country had access to toilets. Figure 16 shows that whilst the majority of coloureds, Indians/Asians and whites had access to a flush or chemical toilet, a mere 40 per cent of African households had this facility in 2001, which is an improvement since only a third of African households had access to toilets in 1996.

Figure 16: Access to sanitation by population group, 1996 and 2001



	1996	2001	1996	2001	1996	2001	1996	2001	1996	2001
	African		Coloured		Indian/Asian		White		National	
None of the above	16.5	16.8	5.0	6.1	0.2	0.7	0.1	0.7	12.4	13.6
Bucket latrine	5.6	4.8	7.1	4.5	0.1	0.2	0.0	0.1	4.6	4.1
Pit latrine	43.8	36.2	7.9	4.9	1.8	1.0	0.3	0.4	32.3	28.3
Flush or chemical toilet	33.8	41.6	79.8	83.8	97.7	97.5	99.4	97.9	50.3	53.4

Source: Census 1996; Census 2001 (own calculations).
Note: Totals may not add up to 100 due to omission of unspecified category.

Furthermore, in 2001 only a third of households in the Eastern Cape had access to toilets, whilst approximately 31 per cent had no access to either a toilet, or a pit or bucket latrine. A similar pattern holds for Limpopo where less than one in five households had access to a toilet, and another one in five had no type of sanitation at all. Moreover, in 2001 less than 10 per cent of households in the rural areas of the Eastern Cape and Limpopo had access to a toilet. Thus, it is evident that quality sanitation facilities are severely lacking in the income-poor provinces. In addition, rural households in the North West and Mpumalanga provinces also have relatively poor access to a toilet. Although there has been an increase in the proportion of rural households with access to a toilet, it is important to note that in both 1996 and 2001, more than a quarter of households in the rural areas of South Africa had no access to either a toilet, or a pit or bucket latrine.

Table 17: Access to sanitation by province, 1996 and 2001

(a) 1996

Province	Flush or chemical toilet	Pit latrine	Bucket latrine	None of the above	Unspecified	Total
Western Cape	85.8	4.8	3.8	5.4	0.2	100.0
Eastern Cape	30.7	33.7	6.2	28.9	0.5	100.0
Northern Cape	59.8	11.7	17.8	10.5	0.2	100.0
Free State	45.2	25.3	20.5	8.8	0.2	100.0
KwaZulu-Natal	41.9	41.7	0.9	15.1	0.4	100.0
North West	31.9	54.9	6.4	6.4	0.3	100.0
Gauteng	83.0	11.7	2.5	2.5	0.3	100.0
Mpumalanga	37.8	49.6	3.6	8.6	0.4	100.0
Limpopo	13.1	64.9	0.5	21.0	0.5	100.0
Total	50.3	32.3	4.6	12.4	0.4	100.0

(b) 2001

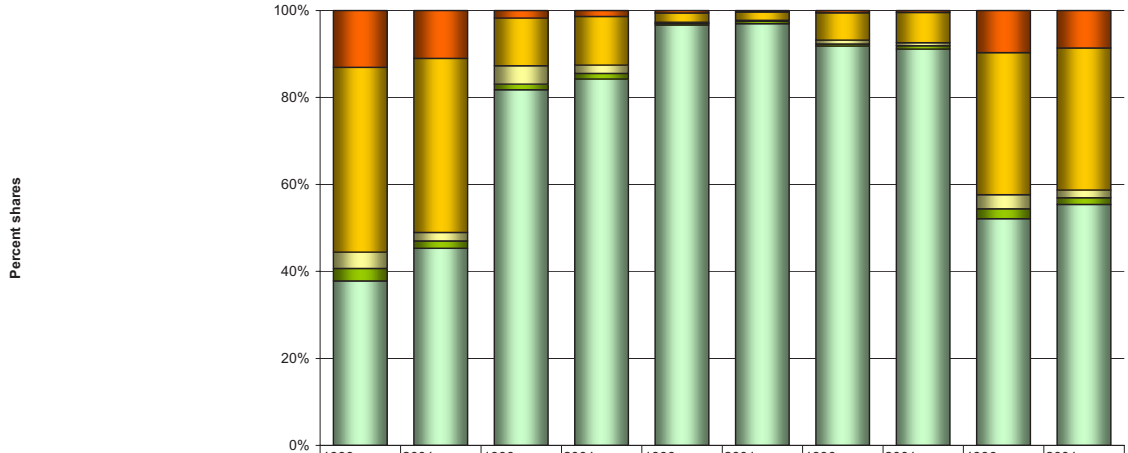
Province	Flush or chemical toilet	Pit latrine	Bucket latrine	None of the above	Unspecified	Total
Western Cape	85.8	2.1	3.7	7.7	0.7	100.0
Eastern Cape	34.6	28.5	5.6	30.7	0.7	100.0
Northern Cape	66.5	10.0	11.8	11.3	0.4	100.0
Free State	46.8	22.6	20.3	9.8	0.4	100.0
KwaZulu-Natal	46.5	35.5	1.1	16.0	0.9	100.0
North West	35.7	50.0	4.5	9.5	0.3	100.0
Gauteng	82.2	11.2	2.3	3.6	0.8	100.0
Mpumalanga	39.7	46.8	2.8	10.3	0.5	100.0
Limpopo	17.3	58.3	0.6	23.3	0.4	100.0
Total	53.4	28.3	4.1	13.6	0.7	100.0

Source: Census 1996; Census 2001 (author's own calculations).

Refuse Removal

In terms of refuse removal by local authorities, there has been only a slight improvement over the inter-censal period, with a mere 56 per cent of households having access to this service in 2001, up from 53 per cent in 1996. Once again, this indicator of living standards is closely linked to income status. For the different population groups, a similar pattern holds to that found for sanitation, with the majority of coloureds, Indians/Asians and whites having their refuse removed on a regular basis. Less than half of African households have their refuse removed on a regular basis, and a further two-fifths make use of their own refuse dumps.

Figure 17: Access to refuse removal by population group, 1996 and 2001



	African		Coloured		Indian/Asian		White		National	
	1996	2001	1996	2001	1996	2001	1996	2001	1996	2001
No rubbish disposal	12.8	10.7	1.7	1.3	0.6	0.3	0.5	0.4	9.5	8.4
Own refuse dump	41.8	39.2	10.8	10.9	2.1	1.9	6.2	6.7	32.2	32.0
Communal refuse dump	3.7	1.9	4.2	1.9	0.3	0.3	0.9	0.7	3.2	1.7
Removed by local authority less often	2.8	1.7	1.2	1.2	0.4	0.5	0.5	0.7	2.2	1.5
Removed by local authority at least weekly	37.2	44.4	80.6	82.3	95.8	95.0	90.6	88.4	51.3	54.2

Source: Census 1996; Census 2001 (own calculations).
Note: Totals may not add up to 100 due to omission of unspecified category.

On a provincial level, yet again the Eastern Cape and Limpopo perform quite poorly in terms of household access to regular refuse removal. In particular, only a third of households in the Eastern Cape and a discouraging 14 per cent of households in Limpopo have their refuse removed on a regular basis. More importantly, in 2001 less than 5 per cent of rural households had their refuse removed by a local authority on a regular basis. It appears that the majority of rural households are reliant on their own refuse dump, with almost three-quarters of households using their own dumps whilst a further 18 per cent of households have no outlets for rubbish disposal

Table 18: Access to refuse removal by province, 1996 and 2001

(a) 1996

Province	Removed by local authority at least weekly	Removed by local authority less often	Comm-unal refuse dump	Own refuse dump	No rubbish disposal	Other	Un-specified	Total
Western Cape	82.4	2.5	3.7	7.7	2.0	0.1	1.6	100.0
Eastern Cape	33.9	1.7	1.7	39.6	21.6	0.1	1.4	100.0
Northern Cape	67.7	2.1	5.2	19.3	4.3	0.2	1.2	100.0
Free State	60.4	4.1	4.3	24.6	5.6	0.1	0.9	100.0
KwaZulu-Natal	42.1	1.2	2.9	40.6	11.3	0.5	1.5	100.0
North West	34.4	1.5	3.9	51.6	7.1	0.2	1.3	100.0
Gauteng	81.7	3.7	3.3	7.1	2.5	0.1	1.5	100.0
Mpumalanga	37.7	1.9	3.3	47.1	8.8	0.1	1.3	100.0
Limpopo	11.1	0.8	3.0	66.1	17.2	0.0	1.7	100.0
Total	51.3	2.2	3.2	32.2	9.5	0.2	1.4	100.0

(b) 2001

Province	Removed by local authority at least weekly	Removed by local authority less often	Comm -unal refuse dump	Own refuse dump	No rubbish disposal	Unspecified	Total
Western Cape	86.2	1.0	2.1	7.2	1.4	2.1	100.0
Eastern Cape	36.1	1.3	1.2	42.6	16.3	2.7	100.0
Northern Cape	67.7	3.0	2.5	21.5	3.6	1.7	100.0
Free State	57.6	3.1	3.4	24.8	9.3	1.7	100.0
KwaZulu-Natal	48.0	1.0	0.8	37.6	9.9	2.7	100.0
North West	35.9	1.0	1.9	51.6	8.3	1.4	100.0
Gauteng	82.1	2.1	2.3	8.4	2.5	2.6	100.0
Mpumalanga	38.0	1.6	1.7	47.0	9.9	1.9	100.0
Limpopo	13.8	0.7	1.0	67.2	15.5	1.8	100.0
Total	54.2	1.5	1.7	32.0	8.4	2.3	100.0

Source: Census 1996; Census 2001 (author's own calculations).

5. Income and Access

In this section, we bring together the analyses of income poverty and asset/service access to create a more nuanced understanding of what it means to be the poorest members of society. We also identify who across the income spectrum has been most affected by changes in access to basic goods and services.

We begin by ordering households according to household income per capita. Households are then grouped into income quintiles. Specifically, the first

income quintile reflects the poorest 20 per cent of households, the second income quintile the next poorest 20 per cent and the fifth income quintile, the 20 percent highest 'income per person' households in the country. We will refer to the poorest 20 per cent as the ultra-poor and the next 20 per cent as the poor.

The derivation of these quintiles is described in detail in Appendix C. Here we consider how the different income quintiles have fared with regard to changes in access to basic goods/services. Table 19 shows access rates by income quintile for 1996 and 2001.

The prior discussion on access rates revealed that even though income poverty seems to have increased, access to basic services has improved, suggesting increases in well-being according to these measures. Table 19 shows that, unsurprisingly, in both 1996 and 2001, as household income rises, so does access to better quality services. Indeed, the poor are most severely deprived in terms of service delivery. It is apparent, nonetheless, that at the national level, improvements have been made in all indicators over the five-year period. For most indicators the gains are less than five percentage points, or one percentage point per annum. In the cases of electricity used for lighting and telephone access in the household, however, the increases in access have been impressive and in excess of ten percentage points.

When considering the extent of improvements in access by quintile, the evidence suggests that even though the poorest quintiles are most deprived, it is generally these households that are experiencing the greatest gains. The proportion of the ultra poor living in formal dwellings increased from 49 per cent to 57 per cent from 1996 to 2001. Access to piped water for this group rose from 65 per cent to 72 per cent, and even though electricity was used for cooking by a mere 27 per cent of households in 2001 (up from 19 per cent in 1996), electricity used for lighting rose from 35 per cent to 57 per cent of households, a greater than 20 percentage point increase over the period. Although sanitation improved in that access to a flush or chemical toilet increased by eight percentage points to 29 per cent in 2001, this was mainly an upgrading from pit latrines to toilets. The proportion of households with no toilet, however, remained stable at a very high 22 per cent. While small gains have been made in refuse removal, only one in three of the poorest households had their refuse removed by a local authority in 2001. Finally, and most spectacular, is the marked increase in access to telephones over the inter-censal period. In 1996, 32 per cent of ultra poor households had no access to a telephone at all. In 2001, this number fell to 10 per cent. Complementing this is the increase in households having a telephone or cellular phone in the home. This figure rose from a mere 7 per cent in 1996 to 23 per cent in 2001. Most of this improvement reflects the massive increase in uptake of cellular telephones.

Table 19: Household services access by income quintile, 1996 and 2001

	Quintiles 1996							Quintiles 2001					
	20%	**40%**	**60%**	**80%**	**100%**	**Total**		**20%**	**40%**	**60%**	**80%**	**100%**	**Total**
Dwelling types													
Formal	48.6	58.2	68.9	78.0	93.5	64.4		56.9	65.4	72.4	82.6	93.6	68.6
Informal	15.6	20.6	19.8	16.7	3.9	16.0		15.2	18.6	19.1	13.8	4.1	16.4
Traditional	34.7	20.0	9.9	3.9	1.5	18.1		27.7	15.7	8.2	3.3	1.9	14.8
Water access													
Piped	64.7	77.9	86.8	93.0	96.4	79.9		72.4	81.5	87.8	92.4	94.7	82.2
Borehole/tank/vendor	10.0	7.3	5.5	3.4	2.1	6.1		5.9	4.4	3.1	1.7	0.9	3.7
Spring/river/dam/pool	23.4	12.9	6.1	2.3	1.0	12.3		16.9	9.5	4.5	1.6	0.9	9.2
Energy source: Lighting													
Electricity	34.6	49.3	63.5	77.5	93.7	57.6		56.8	65.1	74.6	86.4	94.9	69.5
Paraffin	19.2	15.5	10.4	6.6	2.0	12.6		8.8	7.8	6.2	3.4	1.2	6.7
Candles	44.9	34.1	25.0	15.0	3.7	28.5		33.4	26.0	18.3	9.3	3.1	22.6
Energy source: Cooking													
Electricity	19.0	34.0	52.7	71.0	91.0	47.1		27.2	41.0	57.6	77.3	90.2	50.7
Paraffin	23.8	27.7	24.3	18.3	4.4	21.5		22.2	25.5	23.0	13.7	4.0	21.3
Wood	46.1	27.2	14.0	4.2	1.1	22.9		41.1	24.7	11.7	2.9	1.1	20.3
Sanitation													
Flush/chemical toilet	20.7	37.5	57.1	76.2	93.0	50.2		29.0	43.5	60.2	78.5	91.6	53.4
Pit latrine	50.7	42.5	29.6	16.3	5.0	32.3		43.2	35.8	25.9	14.6	5.3	28.3
Bucket latrine	6.5	6.9	5.1	3.2	0.8	4.7		5.4	5.0	4.1	2.4	0.7	4.1
None	21.7	12.8	7.9	4.0	1.0	12.3		22.0	15.1	9.2	4.1	1.8	13.6

Table 19 - continued

	Quintiles 1996							Quintiles 2001					
	20%	**40%**	**60%**	**80%**	**100%**	**Total**		**20%**	**40%**	**60%**	**80%**	**100%**	**Total**
Refuse removal													
Removed by local authority	27.1	44.0	60.3	76.4	88.7	53.4		32.7	47.0	62.3	78.1	87.1	55.7
Own refuse dump	51.1	39.9	27.4	15.8	7.5	32.1		49.7	39.3	27.6	15.4	8.5	32.0
No rubbish disposal	16.3	10.1	6.1	3.5	1.3	9.5		14.0	9.6	5.9	2.9	1.2	8.4
Telephone													
In this dwelling/cellular phone	6.9	13.4	25.8	43.7	77.4	28.6		22.8	30.0	43.5	67.8	88.4	42.4
At a public telephone nearby	38.0	44.1	41.5	35.8	13.7	35.9		47.2	45.6	39.3	24.5	8.7	38.4
At another location	22.9	21.8	19.4	13.6	6.1	16.7		20.4	17.0	12.4	6.2	2.2	13.2
No access to a telephone	31.8	20.3	12.9	6.6	2.5	18.3		9.6	7.5	4.8	1.6	0.7	6.0

Source: Census 1996 and Census 2001, 10 per cent samples.

The pattern of gains is similar for the second-poorest 20 per cent of households (quintile two), but generally the size of the improvements is slightly lower. The poorest 40 per cent of households outperform the remaining 60 per cent in terms of advances in access to better quality services on all measures except for telephones (while impressive gains have been achieved for the poor and ultra-poor, these have been even larger for the wealthier quintiles). We see that income poverty has increased, access inequality is apparent but access has improved, the gap is narrowing, and the gains have been greatest for the most deprived.

6. Conclusion

In this paper, we address changes in the well-being of South Africans between 1996 and 2001 across two dimensions – the distribution of income and access to basic goods and services. The income-based analysis details increases in inequality and poverty at the national level. It also shows a persistent but changing population-group footprint in the structure of South African inequality and poverty. Inequality between population groups is still extremely high but continues a long-run decline in importance. The African group overwhelming dominates both the incidence and share of poverty. At the same time, the African group continues to increase its share in each of the top three income deciles. Inequality continues to widen within each group, evidencing something of the dynamism of post-apartheid South Africa. Within the African and coloured groups, and to a lesser extent the Indian/Asian group, this widening of inequality is due to improvements at the top end of the intra-group distribution as well as increases in measured poverty at the bottom. For white South Africans, the increase in inequality seems to be driven by increases in incomes for a few at the top of the distribution that are so large that they lead to a small increase in the aggregate income share of whites and a widening of group disparity ratios. There is very little evidence of increasing white poverty. Provincial poverty shares have remained fairly stable, with the important exceptions of an increase in the shares for the two best-off provinces (the Western Cape and Gauteng) as well as KwaZulu-Natal, and a decrease in the poverty share of the Eastern Cape. These changes in the provincial poverty shares, together with a complementary increase in the urban share of poverty, give an indication of the importance of the migration of people from the poorest, predominantly rural provinces to major metropolitan centres.

The analysis of access poverty and inequality make it clear that inequalities in access to basic services persist in South Africa on a population-group and

regional level. Whites and Indians/Asians outperform coloureds, who, in turn, enjoy better access than Africans on nearly all measures. The wealthier provinces of Gauteng and the Western Cape have the greatest access rates to quality services, with the income-poor Limpopo and the Eastern Cape faring worst. Other provinces that perform quite poorly in terms of access to services include KwaZulu-Natal and Mpumalanga. Furthermore, we see that the urban-rural divide in terms of access to services is quite stark, with rural areas dramatically worse off than urban areas. Hence, we see that provinces that contain former homeland areas, which were severely neglected by the apartheid government, are particularly deprived of basic services.

Given these persistent inequalities in access, it is not surprising to find that households with poorer access tend to be found in the poorest income quintiles. However, it is important to note that access to basic goods and services has improved for many households in our society, including those in the poorer quintiles. Thus, there is an optimistic lack of correspondence between the slight increase in poverty when measured in income terms and the decrease in poverty when measured in access terms.

Appendix A: Data Decisions concerning the Income Variable

Data on personal income was not collected in exactly the same way in 1996 and in 2000. Both censuses used income bands rather than asking for actual income values. However, these bands are not consistent across the two years. Most important for our analysis is the fact that the highest band in 1996 is set at R30 001 or more. Even in real terms this is far lower than the upper three bands in 2001. This has no bearing on the poverty analysis, as these bands are all far above any realistic poverty line. However, the fact that the upper end of the income distribution was stretched out in 2001 compared to 1996 widens 2001 inequality in and of itself, whether or not there was a real widening of inequality in the underlying distribution. Thus, it was essential to correct for this. We did this by constraining the upper three income categories of 2001 to the equivalent value of the upper category in 1996 – that is, the upper category of 1996 (R30 001 per month) was inflated to 2001 prices (R40 773.56).

One of the reasons for spelling out this one adjustment in some detail is to illustrate the point that our results are directed at ascertaining the direction of the changes to inequality and poverty rather than the absolute magnitude of the changes. Slightly different assumptions about the data will lead to different estimates of the magnitude of inequality and poverty in any given year. At times, this emphasis comes at the cost of deriving the best estimates of inequality or poverty within any given year. Therefore, we place far less emphasis on the actual numbers that we arrived at for either 1996 or 2001.

In both years, we find in the data that there are children below the age of 15 years with positive and often high incomes. We set these to zero. In 2001, a number of imputations were done on the income data to correct for missing data. We do not include the imputed data in our calculations for comparability with 1996.

Some of our decisions were also driven by issues of comparability with a study by Whiteford and Van Seventer (2000). That study presents an analysis of changes in income inequality from 1975 to 1996 using census data. It was well worth benchmarking our analysis against these changes.

To calculate the inequality and poverty indices, a continuous measure of income is required. Income is given in income bands in both censuses. To create a continuous measure of income, the midpoint of each band was assigned to each person in the band. The upper and lower (unbounded) bands were assigned the lower bound values. Furthermore, because we are interested in per capita

income, we summed all positive individual income for each household and then divided by household size to obtain a monthly per capita measure of income.

For the poverty analysis, we chose two poverty lines to measure sensitivity. In 1996, we chose R250 per capita per month, and for comparability inflated this, using a CPI inflator, to R340 (the equivalent of R250 at 2001 prices). For the second line, we chose the $2 a day standard, which at Purchasing Power Parity, in 2001, equated to R4 per day per person or R124 per month.[6] This figure deflated, using a CPI deflator, equates to R91 in 1996.

For comparability between the two censuses and to avoid problems in calculating household size, we excluded all data on people living in institutions, and all results were weighted using the weights supplied by Statistics South Africa.

We provide a number of tables below to assess key impacts of these data decisions.

Table A.1: Descriptive statistics on zero and missing values in the 1996 and 2001 censuses

	1996 Households		**2001 Households**	
Zero	1750790	18.62%	2 564 498	22.93%
Missing	412173	4.38%	586 258	5.24%
Total	9404487	23%	11 181 605	28.17%

Sources: Own calculations, Census 1996, 2001, Statistics South Africa.

Table A.1 shows that the exclusion of missing values and zero values reduces the household sample by close to 23 per cent in 1996 and close to 28 per cent in 2001. These are large numbers.

Table A.2 shows a breakdown of the missing and zero values for each province, population group and urban/rural area. The table reveals that three of the poorest income provinces, the Eastern Cape, KwaZulu-Natal and Limpopo, contribute the greatest percentage of total missing and zero values in 1996 and 2001. In all three cases, this is in excess of their total population share. The same holds true for these three provinces when one looks at the zero income values alone. In both years Gauteng, the Western Cape, Limpopo and KwaZulu-Natal have the

[6] World Bank (2003) *World Development Indicators.* Washington, USA.

largest percentage of missing values. The percentage of missing values for these provinces is also in excess of their total population shares.

Table A.2: Descriptive statistics on zero and missing values in the 1996 and 2001 censuses, by province, population group and urban/rural area

	1996				2001			
	Zero	**Missing**	**Total zero + missing**	**Share of population**	**Zero**	**Missing**	**Total zero + missing**	**Share of population**
Province								
Western Cape	3.28%	7.66%	3.99%	9.69%	4.32%	14.17%	6.14%	9.86%
Eastern Cape	24.70%	11.55%	22.56%	15.85%	19.11%	18.94%	19.08%	14.56%
Northern Cape	0.93%	1.07%	0.95%	2.06%	1.14%	0.99%	1.11%	1.82%
Free State	4.93%	2.95%	4.61%	6.33%	5.69%	4.99%	5.56%	6.11%
KwaZulu-Natal	23.11%	22.99%	23.09%	20.69%	24.51%	23.53%	24.33%	21.24%
North West	8.20%	5.03%	7.68%	8.26%	8.60%	2.66%	7.50%	8.12%
Gauteng	8.88%	23.67%	11.29%	17.79%	14.23%	22.41%	15.75%	19.65%
Mpumalanga	6.84%	9.04%	7.20%	7.1%	6.96%	4.50%	6.50%	6.84%
Limpopo	19.12%	16.06%	18.62%	12.22%	15.45%	7.81%	14.04%	11.79%
Total	100%	100%%	100%	100%	100%	100%	100%	100%
Group								
African	94.29%	72.36%	90.77%	76.74%	94.02%	72.06%	89.96%	79.18%
Coloured	2.92%	5.81%	3.38%	8.9%	3.52%	9.10%	4.55%	8.82%
Indian/Asian	0.61%	1.97%	0.83%	2.6%	0.69%	2.37%	1%	2.57%
White	2.18%	19.86%	5.02%	10.88%	1.78%	16.47%	4.49%	9.43%
Total	100%	100%	100%	100%	100%	100%	100%	100%
Urban/rural								
Urban	29.23%	54.80%	33.40%	53.33%	41.51%	59.16%	44.77%	55.97%
Rural	70.77%	45.20%	66.60%	46.67%	58.49%	40.84%	55.23%	44.03%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Sources: Own calculations, Census 1996, 2001, Statistics South Africa.

Table A.3 summarises the Gini coefficient at national, population group, provincial and urban/rural levels for 1996 and 2001 for various choices of income variable construction. The table is further broken down into whether people with zero incomes are included in the analysis or not.

Table A.3: 1996 and 2001 Gini coefficients across a number of different data assumptions

	1996						2001 Unconstrained						2001 Constrained					
	With Zero			Without Zero			With Zero			Without Zero			With Zero			Without Zero		
	Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval	
National	0.7395 (0.0002)	0.7391	0.7399	0.6786 (0.0003)	0.6780	0.6791	0.8179 *(0.0004)*	0.8172	0.8187	0.7653 *(0.0005)*	0.7642	0.7664	0.7906 *(0.0003)*	0.7900	0.7912	0.7301 *(0.0003)*	0.7295	0.7307
Group																		
African	0.7069 *(0.0004)*	0.7061	0.7076	0.6189 *(0.0003)*	0.6182	0.6196	0.7760 *(0.0007)*	0.7745	0.7776	0.6952 *(0.0010)*	0.6932	0.6972	0.7536 *(0.0004)*	0.7528	0.7543	0.6648 *(0.0005)*	0.6638	0.6657
Coloured	0.5550 *(0.0009)*	0.5531	0.5568	0.5261 *(0.0007)*	0.5245	0.5276	0.6584 *(0.0013)*	0.6557	0.6610	0.6248 *(0.0025)*	0.6195	0.6301	0.6345 *(0.0006)*	0.6331	0.6358	0.5985 *(0.0012)*	0.5961	0.6010
Indian/Asian	0.5016 *(0.0017)*	0.4980	0.5052	0.4787 *(0.0016)*	0.4754	0.4820	0.6234 *(0.0032)*	0.6167	0.6301	0.5994 *(0.0024)*	0.5945	0.6043	0.5830 *(0.0016)*	0.5795	0.5864	0.5563 *(0.0015)*	0.5531	0.5596
White	0.4645 *(0.0006)*	0.4633	0.4657	0.4428 *(0.0007)*	0.4413	0.4443	0.6044 *(0.0012)*	0.6020	0.6068	0.5862 *(0.0012)*	0.5837	0.5887	0.5276 *(0.0007)*	0.5262	0.5290	0.5059 *(0.0006)*	0.5047	0.5071
Province																		
Western Cape	0.6190 *(0.0006)*	0.6177	0.6202	0.5931 *(0.0007)*	0.5916	0.5946	0.7358 *(0.0015)*	0.7328	0.7389	0.7063 *(0.0015)*	0.7032	0.7094	0.7011 *(0.0007)*	0.6997	0.7026	0.6678 *(0.0008)*	0.6661	0.6694
Eastern Cape	0.7807 *(0.0005)*	0.7797	0.7818	0.6901 *(0.0006)*	0.6887	0.6915	0.8322 *(0.0010)*	0.8302	0.8343	0.7606 *(0.0016)*	0.7572	0.7641	0.8091 *(0.0007)*	0.8077	0.8105	0.7278 *(0.0007)*	0.7263	0.7294
Northern Cape	0.6930 *(0.0016)*	0.6896	0.6965	0.6647 *(0.0013)*	0.6620	0.6673	0.7736 *(0.0038)*	0.7656	0.7815	0.7376 *(0.0040)*	0.7294	0.7459	0.7428 *(0.0016)*	0.7396	0.7461	0.7020 *(0.0021)*	0.6977	0.7063
Free State	0.7300 *(0.0008)*	0.7283	0.7317	0.6843 *(0.0009)*	0.6824	0.6862	0.8086 *(0.0020)*	0.8043	0.8128	0.7587 *(0.0023)*	0.7539	0.7636	0.7796 *(0.0011)*	0.7773	0.7819	0.7222 *(0.0014)*	0.7193	0.7251
KwaZulu-Natal	0.7547 *(0.0005)*	0.7536	0.7557	0.6884 *(0.0006)*	0.6872	0.6896	0.8245 *(0.0009)*	0.8228	0.8263	0.7627 *(0.0011)*	0.7604	0.7650	0.8011 *(0.0005)*	0.8000	0.8021	0.7311 *(0.0006)*	0.7298	0.7325
North West	0.7097 *(0.0006)*	0.7083	0.7110	0.6436 *(0.0006)*	0.6423	0.6448	0.7864 *(0.0017)*	0.7829	0.7900	0.7227 *(0.0025)*	0.7174	0.7280	0.7608 *(0.0009)*	0.7590	0.7626	0.6896 *(0.0013)*	0.6867	0.6924
Gauteng	0.6526 *(0.0006)*	0.6513	0.6539	0.6158 *(0.0004)*	0.6150	0.6166	0.7762 *(0.0007)*	0.7746	0.7777	0.7324 *(0.0008)*	0.7306	0.7341	0.7365 *(0.0005)*	0.7354	0.7376	0.6850 *(0.0006)*	0.6836	0.6863
Mpumalanga	0.7322 *(0.0009)*	0.7303	0.7341	0.6716 *(0.0010)*	0.6696	0.6736	0.8051 *(0.0019)*	0.8011	0.8091	0.7488 *(0.0013)*	0.7461	0.7514	0.7775 *(0.0011)*	0.7752	0.7798	0.7133 *(0.0012)*	0.7107	0.7159
Limpopo	0.7714 *(0.0008)*	0.7697	0.7732	0.6735 *(0.0012)*	0.6710	0.6760	0.8080 *(0.0016)*	0.8047	0.8114	0.7301 *(0.0017)*	0.7266	0.7335	0.7926 *(0.0010)*	0.7906	0.7947	0.7085 *(0.0008)*	0.7068	0.7102
Urban/rural																		
Urban	0.6617 *(0.0003)*	0.6611	0.6623	0.6224 *(0.0003)*	0.6218	0.6231	0.7749 *(0.0005)*	0.7740	0.7759	0.7299 *(0.0004)*	0.7289	0.7308	0.7411 *(0.0003)*	0.7405	0.7417	0.6893 *(0.0004)*	0.6885	0.6901
Rural	0.7502 *(0.0004)*	0.7492	0.7511	0.6495 *(0.0006)*	0.6483	0.6507	0.8028 *(0.0010)*	0.8008	0.8048	0.7195 *(0.0020)*	0.7153	0.7237	0.7762 *(0.0006)*	0.7748	0.7775	0.6818 *(0.0011)*	0.6795	0.6841

Sources: Own calculations, Census 1996 2001, Statistics South Africa. *Note*: Standard Errors in parentheses.

The unconstrained column in Table A.3 refers to estimates obtained if we do not constrain the income bands in the 2001 census as described above. The constrained results are for the variable used throughout the body of this paper – that is, the upper category of 1996 (R30 001 per month) inflated to 2001 prices (R40 773.56). Not surprisingly, inequality estimates for the unconstrained income measure are much higher than for the constrained measure. For comparability with 1996, the constrained results are preferred in this paper. The table also shows that measures of inequality are affected by whether we include the zero income estimates in the calculations or not. Including the zeros increases the Gini coefficient for both years. Standard errors for the estimates are very small. Importantly, though, ignoring the magnitude of the estimate and looking only at the trend, the reader will note that the observation of increased inequality between 1996 and 2001 is not affected by whether we include the zero incomes or not.

Table A.4 summarises the provincial income and population shares for per capita income with and without zeros. We see that whether we include the zero income estimates or not makes no difference to the provincial income shares.

Table A.4: Provincial income and population shares for per capita income with and without zeros

	1996 without zeros		1996 with zeros		2001 without zeros		2001 with zeros	
Province	**Pop. share**	**Income share**	**Pop. share**	**Income share**	**Pop. share**	**Income share**	**Pop. share**	**Income share**
Western Cape	11%	17%	10%	17%	11%	16%	10%	16%
Eastern Cape	14%	9%	16%	9%	13%	8%	14%	8%
Northern Cape	2%	2%	2%	2%	2%	2%	2%	2%
Free State	7%	5%	6%	5%	6%	4%	6%	4%
KwaZulu-Natal	20%	17%	21%	17%	20%	16%	21%	16%
North West	8%	6%	8%	6%	8%	6%	8%	6%
Gauteng	20%	35%	18%	35%	21%	39%	20%	39%
Mpumalanga	7%	5%	7%	5%	7%	5%	7%	5%
Limpopo	10%	5%	12%	5%	11%	5%	12%	5%
	100%	100%	100%	100%	100%	100%	100%	100%

Sources: Own calculations, Census 1996, 2001, Statistics South Africa.

Tables A.5 to A.12 present the same poverty level estimates as presented in the main text with the addition of their standard errors and confidence intervals. Results are presented for estimates including and excluding zero income households.

Table A.5: National Poverty levels 1996

	1996											
	With Zeros						Without Zeros					
	Headcount			Poverty Gap Ratio			Headcount			Poverty Gap Ratio		
	Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval	
National												
$2 per day	0.4003	0.3998	0.4008	0.2789	0.2785	0.2794	0.2601	0.2595	0.2606	0.1103	0.1100	0.1106
	(0.0003)			(0.0002)			(0.0003)			(0.0001)		
R250 (1996)	0.5945	0.5940	0.5950	0.4297	0.4293	0.4302	0.4997	0.4991	0.5003	0.2963	0.2959	0.2968
	(0.0003)			(0.0002)			(0.0003)			(0.0002)		

Sources: Own calculations, Census 1996, Statistics South Africa.
Note: Standard Errors in parentheses.

Table A.6: Poverty levels by race, 1996

	1996											
	With Zeros						Without Zeros					
	Headcount			Poverty Gap Ratio			Headcount			Poverty Gap Ratio		
	Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval	
Group												
African												
$2 per day	0.4896	0.4890	0.4902	0.3416	0.3411	0.3421	0.3364	0.3358	0.3371	0.1439	0.1436	0.1443
	(0.0003)			(0.0003)			(0.0003)			(0.0002)		
R250 (1996)	0.7080	0.7074	0.7085	0.5200	0.5195	0.5205	0.6203	0.6197	0.6210	0.3760	0.3755	0.3765
	(0.0003)			(0.0003)			(0.0003)			(0.0002)		
Coloured												
$2 per day	0.1551	0.1538	0.1564	0.0936	0.0926	0.0945	0.1003	0.0991	0.1014	0.0347	0.0342	0.0352
	(0.0007)			(0.0005)			(0.0006)			(0.0003)		
R250 (1996)	0.3817	0.3800	0.3835	0.2079	0.2068	0.2091	0.3416	0.3398	0.3433	0.1565	0.1555	0.1575
	(0.0009)			(0.0006)			(0.0009)			(0.0005)		
Indian/Asian												
$2 per day	0.0695	0.0679	0.0711	0.0530	0.0516	0.0543	0.0267	0.0257	0.0278	0.0094	0.0090	0.0099
	(0.0008)			(0.0007)			(0.0005)			(0.0002)		
R250 (1996)	0.1471	0.1449	0.1494	0.0878	0.0862	0.0893	0.1080	0.1059	0.1100	0.0458	0.0448	0.0469
	(0.0012)			(0.0008)			(0.0010)			(0.0005)		
White												
$2 per day	0.0495	0.0488	0.0502	0.0430	0.0424	0.0437	0.0109	0.0106	0.0113	0.0042	0.0041	0.0044
	(0.0004)			(0.0003)			(0.0002)			(0.0001)		
R250 (1996)	0.0704	0.0695	0.0712	0.0542	0.0535	0.0549	0.0327	0.0321	0.0333	0.0159	0.0156	0.0162
	(0.0004)			(0.0004)			(0.0003)			(0.0002)		

Sources: Own calculations, Census 1996, Statistics South Africa.
Note: Standard Errors in parentheses.

Table A.7: Poverty Levels by province, 1996

	1996											
	With Zeros						Without Zeros					
	Headcount			Poverty Gap Ratio			Headcount			Poverty Gap Ratio		
	Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval	
Province												
Western Cape												
$2 per day	0.1258	0.1247	0.1269	0.0855	0.0847	0.0864	0.0664	0.0655	0.0673	0.0234	0.0230	0.0238
	(0.0006)			(0.0004)			(0.0004)			(0.0002)		
R250 (1996)	0.3035	0.3020	0.3051	0.1692	0.1682	0.1703	0.2562	0.2547	0.2577	0.1128	0.1120	0.1136
	(0.0008)			(0.0005)			(0.0008)			(0.0004)		
Eastern Cape												
$2 per day	0.5595	0.5582	0.5608	0.4010	0.3999	0.4022	0.3774	0.3759	0.3790	0.1534	0.1526	0.1542
	(0.0007)			(0.0006)			(0.0008)			(0.0004)		
R250 (1996)	0.7559	0.7547	0.7570	0.5802	0.5792	0.5813	0.6550	0.6534	0.6565	0.4067	0.4056	0.4079
	(0.0006)			(0.0005)			(0.0008)			(0.0006)		
Northern Cape												
$2 per day	0.3072	0.3036	0.3108	0.1695	0.1671	0.1720	0.2432	0.2397	0.2467	0.0929	0.0912	0.0945
	(0.0018)			(0.0013)			(0.0018)			(0.0009)		
R250 (1996)	0.6019	0.5982	0.6056	0.3646	0.3618	0.3674	0.5652	0.5612	0.5691	0.3059	0.3033	0.3085
	(0.0019)			(0.0014)			(0.0020)			(0.0013)		
Free State												
$2 per day	0.4152	0.4131	0.4172	0.2599	0.2583	0.2615	0.3161	0.3140	0.3182	0.1346	0.1334	0.1357
	(0.0010)			(0.0008)			(0.0011)			(0.0006)		
R250 (1996)	0.6471	0.6451	0.6491	0.4479	0.4463	0.4496	0.5873	0.5851	0.5895	0.3544	0.3528	0.3560
	(0.0010)			(0.0008)			(0.0011)			(0.0008)		

Table A.7 – continued

KwaZulu-Natal												
$2 per day	0.4660	0.4648	0.4672	0.3274	0.3264	0.3284	0.3218	0.3205	0.3230	0.1458	0.1451	0.1465
	(0.0006)			(0.0005)			(0.0006)			(0.0004)		
R250 (1996)	0.6549	0.6538	0.6560	0.4885	0.4875	0.4895	0.5617	0.5604	0.5630	0.3504	0.3494	0.3513
	(0.0006)			(0.0005)			(0.0007)			(0.0005)		
North West												
$2 per day	0.4157	0.4139	0.4175	0.2841	0.2827	0.2856	0.2827	0.2809	0.2845	0.1211	0.1202	0.1221
	(0.0009)			(0.0008)			(0.0009)			(0.0005)		
R250 (1996)	0.6386	0.6368	0.6404	0.4524	0.4509	0.4539	0.5563	0.5543	0.5583	0.3277	0.3263	0.3292
	(0.0009)			(0.0008)			(0.0010)			(0.0007)		
Gauteng												
$2 per day	0.1781	0.1772	0.1791	0.1277	0.1269	0.1285	0.0911	0.0903	0.0919	0.0354	0.0350	0.0357
	(0.0005)			(0.0004)			(0.0004)			(0.0002)		
R250 (1996)	0.3287	0.3275	0.3299	0.2131	0.2122	0.2140	0.2576	0.2564	0.2587	0.1297	0.1291	0.1304
	(0.0006)			(0.0005)			(0.0006)			(0.0003)		
Mpumalanga												
$2 per day	0.4259	0.4239	0.4279	0.2870	0.2853	0.2886	0.2959	0.2939	0.2980	0.1256	0.1245	0.1266
	(0.0010)			(0.0008)			(0.0010)			(0.0005)		
R250 (1996)	0.6633	0.6614	0.6652	0.4668	0.4651	0.4684	0.5871	0.5849	0.5893	0.3461	0.3445	0.3476
	(0.0010)			(0.0008)			(0.0011)			(0.0008)		
Limpopo												
$2 per day	0.6052	0.6037	0.6067	0.4318	0.4304	0.4331	0.4360	0.4342	0.4378	0.1883	0.1873	0.1893
	(0.0008)			(0.0007)			(0.0009)			(0.0005)		
R250 (1996)	0.7997	0.7985	0.8010	0.6201	0.6189	0.6213	0.7139	0.7122	0.7156	0.4574	0.4561	0.4586
	(0.0006)			(0.0006)			(0.0009)			(0.0007)		

Sources: Own calculations, Census 1996, Statistics South Africa.
Note: Standard Errors in parentheses.

Table A.8: Poverty levels by Urban-Rural, 1996

	1996											
	With Zeros						Without Zeros					
	Headcount			Poverty Gap Ratio			Headcount			Poverty Gap Ratio		
	Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval	
Urban/rural												
Urban												
$2 per day	0.2197	0.2191	0.2203	0.1502	0.1497	0.1507	0.1291	0.1286	0.1296	0.0516	0.0513	0.0518
	(0.0003)			(0.0002)			(0.0003			(0.0001)		
R250 (1996)	0.3954	0.3947	0.3962	0.2574	0.2569	0.2580	0.3253	0.3246	0.3260	0.1712	0.1708	0.1717
	(0.0004)			(0.0003)			(0.0004)			(0.0002)		
Rural												
$2 per day	0.6063	0.6055	0.6071	0.4258	0.1497	0.1507	0.4477	0.4468	0.4487	0.1945	0.1940	0.1950
	(0.0004)			(0.0002)			(0.0005)			(0.0003)		
R250 (1996)	0.8215	0.8209	0.8221	0.6262	0.6257	0.6268	0.7497	0.7489	0.7505	0.4757	0.4751	0.4763
	(0.0003)			(0.0003)			(0.0004)			(0.0003)		

Sources: Own calculations, Census 1996, Statistics South Africa.
Note: Standard Errors in parentheses.

Table A.9: National Poverty Levels, 2001

	2001											
	With Zeros						Without Zeros					
	Headcount			Poverty Gap Ratio			Headcount			Poverty Gap Ratio		
	Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval	
National												
$2 per day	0.4426	0.4421	0.4432	0.3121	0.3117	0.3126	0.2816	0.2811	0.2822	0.1134	0.1131	0.1137
	(0.0003)			(0.0002)			(0.0003)			(0.0001)		
R250 (1996)	0.6543	0.6538	0.6548	0.4727	0.4722	0.4731	0.5545	0.5539	0.5551	0.3203	0.3199	0.3208
	(0.0003)			(0.0002)			(0.0003)			(0.0002)		

Sources: Own calculations, Census 2001, Statistics South Africa.
Note: Standard Errors in parentheses.

Table A.10: Poverty levels by Race, 2001

	2001											
	With Zeros						Without Zeros					
	Headcount			Poverty Gap Ratio			Headcount			Poverty Gap Ratio		
	Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval	
Group												
African												
$2 per day	0.5246	0.5240	0.5252	0.3704	0.3699	0.3709	0.3533	0.3526	0.3540	0.1434	0.1431	0.1438
	(0.0003)			(0.0003)			(0.0003)			(0.0002)		
R250 (1996)	0.7561	0.7555	0.7566	0.5547	0.5542	0.5552	0.6681	0.6675	0.6688	0.3942	0.3937	0.3947
	(0.0003)			(0.0002)			(0.0003)			(0.0002)		
Coloured												
$2 per day	0.2052	0.2038	0.2066	0.1298	0.1288	0.1309	0.1271	0.1259	0.1284	0.0443	0.0438	0.0449
	(0.0007)			(0.0005)			(0.0006)			(0.0003)		
R250 (1996)	0.4598	0.4581	0.4616	0.2627	0.2614	0.2639	0.4068	0.4050	0.4086	0.1902	0.1892	0.1913
	(0.0009)			(0.0006)			(0.0009)			(0.0005)		
Indian/Asian												
$2 per day	0.0921	0.0902	0.0940	0.0699	0.0683	0.0715	0.0342	0.0329	0.0354	0.0106	0.0101	0.0111
	(0.0010)			(0.0009)			(0.0006)			(0.0003)		
R250 (1996)	0.1940	0.1914	0.1966	0.1142	0.1124	0.1161	0.1426	0.1402	0.1449	0.0577	0.0565	0.0589
	(0.0013)			(0.0010)			(0.0012)			(0.0006)		
White												
$2 per day	0.0538	0.0530	0.0546	0.0472	0.0464	0.0480	0.0103	0.0099	0.0107	0.0035	0.0033	0.0036
	(0.0004)			(0.0004)			(0.0002)			(0.0001)		
R250 (1996)	0.0823	0.0813	0.0834	0.0596	0.0588	0.0604	0.0402	0.0395	0.0410	0.0164	0.0161	0.0168
	(0.0005)			(0.0004)			(0.0004)			(0.0002)		

Sources: Own calculations, Census 2001, Statistics South Africa.
Note: Standard Errors in parentheses.

Table A.11: Poverty levels by province, 2001

	2001											
	With Zeros						Without Zeros					
	Headcount			Poverty Gap Ratio			Headcount			Poverty Gap Ratio		
	Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval	
Province												
Western Cape												
$2 per day	0.1891	0.1878	0.1905	0.1310	0.1299	0.1320	0.0986	0.0975	0.0997	0.0339	0.0335	0.0344
	(0.0007)			(0.0005)			(0.0005)			(0.0002)		
R250 (1996)	0.4070	0.4054	0.4087	0.2385	0.2373	0.2397	0.3408	0.3391	0.3425	0.1535	0.1526	0.1544
	(0.0008)			(0.0006)			(0.0009)			(0.0005)		
Eastern Cape												
$2 per day	0.5798	0.5785	0.5812	0.4059	0.4047	0.4071	0.4009	0.3993	0.4025	0.1529	0.1521	0.1537
	(0.0007)			(0.0006)			(0.0008)			(0.0004)		
R250 (1996)	0.8029	0.8019	0.8040	0.6025	0.6015	0.6036	0.7190	0.7176	0.7205	0.4333	0.4322	0.4344
	(0.0006)			(0.0005)			(0.0008)			(0.0006)		
Northern Cape												
$2 per day	0.3475	0.3438	0.3511	0.2141	0.2114	0.2169	0.2440	0.2404	0.2475	0.0895	0.0879	0.0911
	(0.0019)			(0.0014)			(0.0018)			(0.0008)		
R250 (1996)	0.6341	0.6304	0.6378	0.4045	0.4016	0.4074	0.5760	0.5719	0.5801	0.3100	0.3074	0.3127
	(0.0019)			(0.0015)			(0.0021)			(0.0014)		
Free State												
$2 per day	0.4840	0.4818	0.4862	0.3220	0.3202	0.3238	0.3497	0.3473	0.3521	0.1456	0.1443	0.1469
	(0.0011)			(0.0009)			(0.0012)			(0.0006)		
R250 (1996)	0.7303	0.7284	0.7322	0.5184	0.5167	0.5201	0.6601	0.6578	0.6624	0.3930	0.3913	0.3947
	(0.0010)			(0.0009)			(0.0012)			(0.0009)		

Table A.11 – continued

KwaZulu-Natal												
$2 per day	0.5249	0.5237	0.5261	0.3739	0.3728	0.3749	0.3579	0.3566	0.3593	0.1538	0.1530	0.1545
	(0.0006)			(0.0005)			(0.0007)			(0.0004)		
R250 (1996)	0.7196	0.7185	0.7206	0.5435	0.5426	0.5445	0.6210	0.6196	0.6223	0.3831	0.3821	0.3841
	(0.0006)			(0.0005)			(0.0007)			(0.0005)		
North West												
$2 per day	0.4581	0.4562	0.4599	0.3202	0.3187	0.3217	0.2966	0.2947	0.2984	0.1176	0.1167	0.1186
	(0.0009)			(0.0008)			(0.0010)			(0.0005)		
R250 (1996)	0.6918	0.6901	0.6935	0.4938	0.4923	0.4953	0.5999	0.5979	0.6020	0.3430	0.3416	0.3444
	(0.0009)			(0.0008)			(0.0010)			(0.0007)		
Gauteng												
$2 per day	0.2619	0.2608	0.2629	0.1995	0.1986	0.2005	0.1176	0.1167	0.1184	0.0431	0.0427	0.0435
	(0.0005)			(0.0005)			(0.0004)			(0.0002)		
R250 (1996)	0.4372	0.4360	0.4384	0.2974	0.2964	0.2983	0.3272	0.3259	0.3284	0.1600	0.1593	0.1608
	(0.0006)			(0.0005)			(0.0006)			(0.0004)		
Mpumalanga												
$2 per day	0.4803	0.4783	0.4823	0.3305	0.3288	0.3321	0.3303	0.3281	0.3325	0.1371	0.1360	0.1383
	(0.0010)			(0.0009)			(0.0011)			(0.0006)		
R250 (1996)	0.7195	0.7177	0.7213	0.5153	0.5137	0.5169	0.6385	0.6363	0.6407	0.3754	0.3738	0.3770
	(0.0010)			(0.0008)			(0.0011)			(0.0008)		
Limpopo												
$2 per day	0.5924	0.5909	0.5939	0.4139	0.4125	0.4152	0.4270	0.4252	0.4288	0.1760	0.1751	0.1770
	(0.0008)			(0.0007)			(0.0009)			(0.0005)		
R250 (1996)	0.8139	0.8127	0.8151	0.6137	0.6125	0.6148	0.7384	0.7368	0.7401	0.4569	0.4557	0.4582
	(0.0006)			(0.0006)			(0.0008)			(0.0006)		

Sources: Own calculations, Census 2001, Statistics South Africa.
Note: Standard Errors in parentheses.

Table A.12: Poverty levels by Urban Rural, 2001

	2001											
	With Zeros						Without Zeros					
	Headcount			Poverty Gap Ratio			Headcount			Poverty Gap Ratio		
	Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval		Estimate	95 % Conf. Interval	
Urban/rural												
Urban												
$2 per day	0.3014	0.3008	0.3021	0.2178	0.2172	0.2183	0.1617	0.1611	0.1623	0.0613	0.0610	0.0615
	(0.0003)			(0.0003)			(0.0003)			(0.0001)		
R250 (1996)	0.4994	0.4987	0.5001	0.3391	0.3386	0.3397	0.3992	0.3985	0.4000	0.2069	0.2064	0.2074
	(0.0004)			(0.0003)			(0.0004)			(0.0002)		
Rural												
$2 per day	0.6209	0.6201	0.6217	0.4313	0.4306	0.4320	0.4611	0.4601	0.4620	0.1914	0.1909	0.1919
	(0.0004)			(0.0004)			(0.0005)			(0.0003)		
R250 (1996)	0.8500	0.8494	0.8506	0.6414	0.6408	0.6419	0.7868	0.7860	0.7876	0.4901	0.4894	0.4907
	(0.0003)			(0.0003)			(0.0004)			(0.0003)		

Sources: Own calculations, Census 2001, Statistics South Africa.
Note: Standard Errors in parentheses.

Table A.13 shows the proportion of the poor living in each province at the $2 a day poverty line. Results in the main body of the paper present results for only the non-zero values and exclude the zero income values. The table shows that calculations of the total provincial proportion of the poor do not change dramatically whether we use the income measure with or without zeros.

Table A.13: Poverty shares by province including and excluding zero incomes.

	Headcount	**Poverty gap ratio**	**Headcount**	**Poverty gap ratio**
Poverty Line $2	**1996**		**2001**	
With zero income				
Western Cape	0.03	0.03	0.04	0.04
Eastern Cape	0.22	0.23	0.19	0.19
Northern Cape	0.02	0.01	0.01	0.01
Free State	0.07	0.06	0.07	0.06
KwaZulu-Natal	0.24	0.24	0.25	0.25
North West	0.09	0.09	0.09	0.09
Gauteng	0.08	0.08	0.12	0.12
Mpumalanga	0.07	0.07	0.08	0.07
Limpopo	0.18	0.19	0.16	0.16
Without zero income				
Western Cape	0.03	0.02	0.04	0.03
Eastern Cape	0.20	0.19	0.18	0.17
Northern Cape	0.02	0.02	0.02	0.02
Free State	0.08	0.08	0.08	0.08
KwaZulu-Natal	0.25	0.26	0.26	0.27
North West	0.09	0.09	0.09	0.09
Gauteng	0.07	0.06	0.09	0.08
Mpumalanga	0.08	0.08	0.08	0.08
Limpopo	0.17	0.18	0.17	0.17

Sources: Own calculations, Census 1996, 2001, Statistics South Africa.

Appendix B: Issues encountered in Measuring Access to Water

The change in the phrasing of the 'Main source of Water' variable in the Census 1996 and Census 2001 questionnaire leads to difficulties when analysing household access to water and, in particular, makes the comparison between access to water in 1996 and in 2001 complicated. In the 1996 Census questionnaire, households were asked 'What is your main water supply?' but in the 2001 Census questionnaire, households were first asked, 'In which way does this household obtain piped water for domestic use?', with alternatives ranging from 'no access to piped water' to 'piped water in a community' and 'piped water inside dwelling'. This question was then followed up by one asking, 'What is this households main source of water for domestic use?'. The alternatives provided do not include 'piped water' but in its place refer to 'Regional/local water scheme'. An analysis of these two water variables in 2001 demonstrates a lack of understanding with regards to the option of 'Regional/local water scheme', as there are more households who have access to piped water than those receiving their water from a water scheme, implying that there are households who obtain their piped water from a borehole. Thus, we see that it is impossible to compare the 'main source of water' from 1996 with that in 2001. However, Statistics South Africa does provide a derived 'access to water' variable, which yields results that are comparable to those of the September editions of the *Labour Force Survey* for 2000, 2001 and 2002. In this paper, the derived 'access to water' variable is used for analysis.

Appendix C: The Derivation of Household Income Quintiles for a Comparison of the Distribution of Household Access with the Distribution of Household Income

Tables C.1 and C.2 show the cut-off levels for the income quintile bands for 1996 and 2001 in real terms (1996 rands). It must be noted that these cut-offs reflect per capita income at the household level. We choose the household as the unit of analysis for this section, as service provision generally occurs at the household level. As poorer households have larger average household sizes, the share of the population relating to the bottom quintiles will be greater than the respective household share. For example, the poorest 20 per cent of households in 1996 account for 29 per cent of the population. In 2001, the poorest 20 per cent of households account for an even higher 34 per cent of individuals. In our income analysis of Sections 2 and 3 of this paper, we use individuals as the unit of analysis. Thus, those in the bottom quintile here make up close to the bottom two quintiles in the analysis of these sections. It is this re-division of households that accounts for the fact that per capita income appears to go up in most quintiles from 1996 to 2001 in this household-level analysis, whereas it falls in most quintiles in the analysis of Sections 2 and 3.

Table C.1: Income quintiles, 1996

Quintile	No. of households	%	Cumulative %	Mean per capita household income	Min.	Max.	Share of population
1	1 396 336	20.0	20.0	62.7	3.0	110.3	29.1
2	1 414 445	20.3	40.3	180.8	110.9	275.3	24.1
3	1 383 028	19.8	60.1	396.8	275.3	600.1	18.2
4	1 392 766	20.0	80.0	923.0	600.1	1 400.1	15.2
5	1 393 693	20.0	100.0	3 501.6	1 400.2	30 001.0	13.4
Total	6 980 268	100.0	100.0	1 011.1	3.0	30 001.0	100.0

Source: Census 1996, Census 2001 (own calculations).

Table C.2: Income quintiles, 2001

Quintile	No. of households	%	Cumulative %	Mean per capita household income	Min.	Max.	Share of population
1	1 822 208	22.7	22.7	91.4	7.4	150.1	34.2
2	1 655 735	20.6	43.3	237.8	150.2	300.3	20.6
3	1 598 556	19.9	63.1	522.9	300.3	600.5	16.9
4	1 369 577	17.0	80.2	1 138.2	616.8	1 800.3	14.7
5	1 595 643	19.8	100.0	5 751.1	1 800.3	40 773.6	13.6
Total	8 041 719	100.0	100.0	1 508.6	7.4	40 773.6	100.0

Source: Census 1996, Census 2001 (own calculations).

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