Changes in Standard of Living Among Population Groups in South Africa: 1998-2006

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Abstract

We examine changes in standard of living in South Africa 1998-2006 overall and for racial and ethnic population subgroups. Aspects of standard of living are combined to define four standard of living groups. The data sources are large (20,000-30,000 households) nationally representative surveys. The percent of urban African households in the top standard of living group increased from 14% to 22% between 1998 and 2006, indicating emergence of an urban African middle class. About 43% of Coloured households and about 80% of White or Asian households were in the top group throughout the period. The percent of rural Africans in the worst group declined from 10% to 6%. In addition, the percent of the population and of groups, such as rural Africans, in the worst category of each of the standard of living indicators declined substantially between 1998 and 2006, showing substantial poverty alleviation. There is no evidence of deterioration in the standard of living of White or Asian households.

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This paper looks at changes 1998-2006 in the standard of living for population groups in South Africa. The main aspects of standard of living examined are the source of drinking water and the type of sanitation used. Lighting source, cooking source and type of housing are also considered in defining groups by sets of standard of living indicators.

The apartheid regime was designed to maximize the welfare of White South Africans. However, there were three other officially-recognized population groups, Asians, Coloured and Africans. Asians were mainly comprised of persons with origins in India, although Asians also included some people with origins in China and elsewhere in Asia. Coloured were a mixed race group originating 300 years ago from the descendents of Portuguese and Malay on the one hand and predominantly the members of one African ethnic group, the Khokhoi, on the other hand. Africans are members of Bantu-based African ethnic groups. Under apartheid, Africans were subject to the most onerous restrictions, including being barred from residence in cities until 1985, Coloured were subject to fewer restrictions and Asians to even fewer restrictions. The effects of the differences among these population groupings dating from the apartheid period are reflected in persistent differences in conditions of life of South Africans today.

Many studies have found increases in income inequality in South Africa since the fall of Apartheid (c.f. Leibbrandt *et al*., 2006; Seekings and Nattrass, 2005; South Africa, Statistics South Africa, 2002). However another way to look at inequality and household welfare is to examine the distribution in the population and within groups of aspects of standard of living.

This paper looks at the standard of living of South African households as a whole, as well as of all African households, rural African households, urban African households, Coloured households and White or Asian households.

We have three goals in our analysis. One is to identify households that are or arguably might be thought to be middle class. These households are the best candidates for participation in the modern sector of the South African economy, both as producers and as consumers. An increase in this group is directly related to South African economic growth and the prospects for economic growth in the near future.

A second goal is to identify those households that have an extremely poor standard of living. Most of these households live in an overall situation of absolute poverty. Reduction of the percent of households in this group is a direct indicator of the extent of poverty alleviation.

A third goal is to identify those households that, while not necessarily part of the middle class, have a reasonable and safe standard of living, especially regarding the source of drinking water and type of sanitation. The source of drinking water and type of sanitation might not be the most desirable or convenient, i.e., a household might not have a water tap in the dwelling and a flush toilet in the dwelling, but the water source and sanitation source are safe and fairly convenient. It would be desirable for all South African households to attain this standard of living.

With these three goals in mind, we combine aspects of standard of living to identify four groups differentiated by standard of living. The top group has characteristics that make members of those households part of the middle class or

potentially part of the middle class. The bottom group has an extremely poor standard of living and could be characterized as living in absolute poverty.

There have been many approaches to defining middle class households. Some have used education or occupation as a defining characteristic, and others have used household possessions, items purchased, or income (Black Diamond 1, 2007; International Centre for Policy Studies, 2002; Johnston, 2004; Senauer and Goetz, 2003).

We have not used household possessions to identify middle class households partially because, although some household possessions are asked about in the data sources used, the list is not consistent across surveys taken in different years. Also, whether a household possesses an item, such as a television, reflects not only the purchasing power of that household but also lifestyle preferences that could have little to do with whether the household is middle class.

There is no general agreement about what the criteria should be for defining a household as middle class (Johnston, 2004). However, all of the definitions used seem to aim at identifying households with a secure living situation without serious concerns about shelter, water and sanitation, and further identifying households that have the potential to contribute to economic growth and participate in modern markets. Our definition of the middle class, using standard of living indicators, incorporates aspects of a secure living situation.

Data Sources

The analysis in this paper is based on the 1998-1999 October Household Surveys, the 2000-2001 Labour Force Surveys and the 2002-2006 General Household Surveys. These are national representative surveys covering 18,000-30,000 households.[1] The October Household Surveys and the General Household Surveys are broad social and demographic surveys. The Labour Force Surveys focus more specifically on economic activity and labor force participation, although some information about aspects of standard of living is collected

We use the 2000 Labour Force Survey because the October Household Surveys were last administered in 1999, and the General Household Surveys began in 2002. The 2001 Labour Force Survey was used rather than the 2001 South African Census because in the area of sanitation, the 2001 Census recorded whether the household used a flush toilet but did not include the location of the flush toilet, such as whether it was in the dwelling, on site, or off site. Whether a flush toilet is in the dwelling is an important factor in determining to which standard of living group a household belongs.

Whenever the questionnaires for surveys or censuses are constructed, there are reasons to retain earlier questions exactly and reasons to modify or omit earlier

[1] The 1995-1997 October Household Surveys are valuable data sources but have specific limitations which limit their comparability with later surveys. These issues are discussed further in the Data Appendix.

questions. We chose data sources all of which included the questions that we needed to classify households into socio-economic groups in an identical or near-identical form.[2]

These surveys collect data that refer to persons within each household as well as characteristics of entire households. This paper is based on data that refer to a household as a whole, such as the household's main source of drinking water. The population group of the household is identified as the population group of the person designated as the head of the household. Throughout this paper, the percent distributions refer to distributions of households rather than to the distribution of persons. In 2004, for example, 76.6% of all households were headed by an African, but 79.2% of all persons were Africans.

Other scholars have used the October Household Surveys and the General Household Surveys to look at changes in standard of living. Some have used these data to look at changes in poverty or in overall social welfare. Leibbrandt *et al.* (2006) looked at the distribution of several indicators of standard of living, such as housing type, water source, sanitation, use of electricity for lighting, and and use of electricity for cooking, across population group and across provinces, using data from the 1996 and 2001 South African censuses. They examined the urban population as a whole and the rural population as a whole. An earlier Statistics South Africa (2001) publication presented indicators of the standard of living, including source of water and sanitation, 1995-1999, for South African households as a whole. Romani and Anderson (2002) looked at some aspects of standard of living 1994-1999 for non-Africans, rural Africans, and urban Africans, using October Households Surveys. Bhorat, Naidoo, and van der Westhuizen (2006) examined non-income welfare 1993-2004, including access to services and assets. They used the 1993 SALDRU Survey, the 1999 October Household Survey, and the 2004 General Household Survey.

Population groupings

The number of households overall and by population group in the 2006 General Household Survey is shown in Table 1, as an example of the situation in a given year. Table 1 also shows the percent distribution of households by population group in the survey and the percent of households by population group in the weighted sample. The sample is weighted in order to take into account the difference between the distribution in the sample and the distribution in the actual South African population in 2006. Weighted data, using the household weight, are used in all analyses in this paper.[3]

There are Asian households in each of the surveys. If analysis were done on the Asian population by itself, the results would often be unreliable due to the small number of cases.

[2] There is a small change across surveys in the question about type of housing, with living in a retirement community added as a response category in later surveys. We think it is not problematic that we classify those who live in a retirement community as residing in modern housing.

[3] When confidence intervals are calculated and tests of statistical significance are done, the household weights are scaled so that the weighted total number of households in the survey in the given year is the same as the actual number of households in the survey in that year.

Table 1. Unweighted and weighted distribution of households by population group of the household head in the 2006 General Household Survey

Group	Number of Households	Percent Distribution in Sample	Percent by Population Group in Sample Weighted by Household Weight
African	21,721	77.6	77.5
Coloured	3,430	12.2	7.6
Asian	509	1.8	2.5
White	2,316	8.3	12.3
Unspecified	26	.1	
Total	28,002	100.0	100.0

Figure 1 shows some characteristics of the four population groups in 2006. The characteristics of Asian households and of White households are similar. In this paper, due to the small number of Asian households and the general similarity in the characteristics of White households and of Asian households, White and Asian households are combined into one group. This group is referred to as White or Asian households.

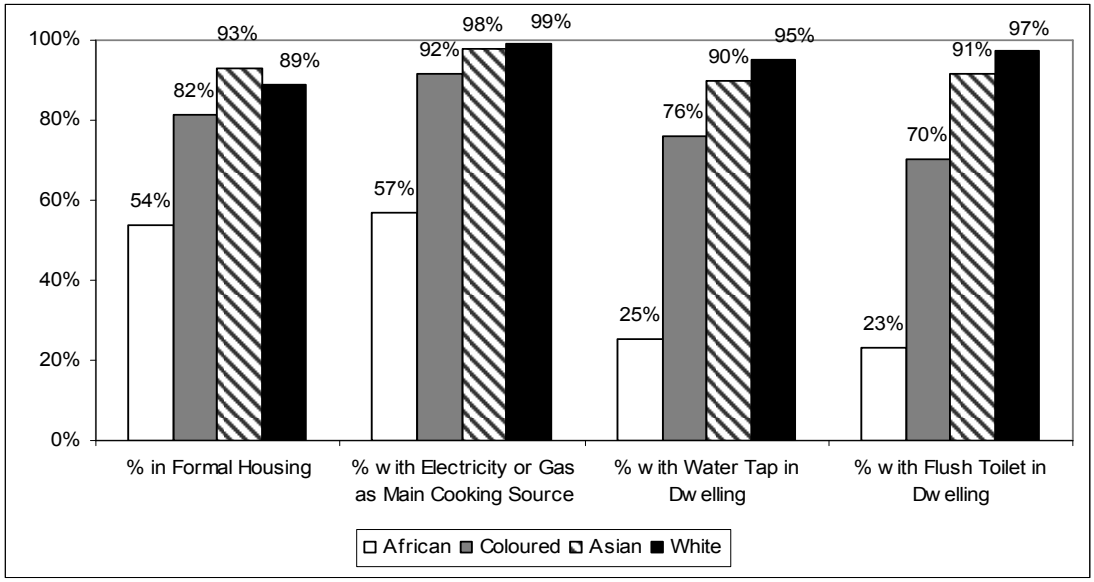
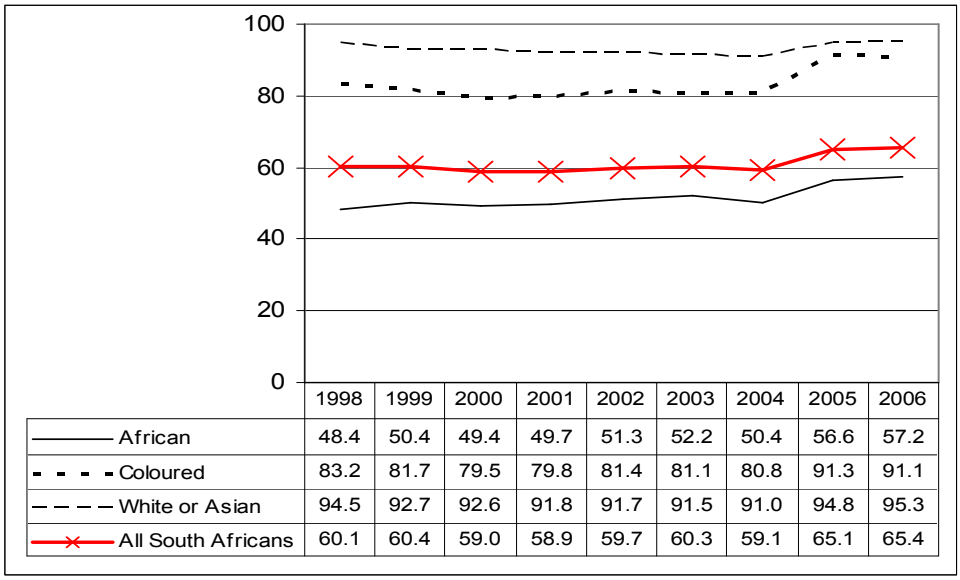


Figure 1. Characteristics of population groups, 2006

Figure 2 shows the percent of households in each of the three population groupings (African, Coloured, and White or Asian) who resided in an urban place in each year 1998-2006. In every year, the vast majority of Coloured households and of White or Asian households resided in an urban place.

About half of African households resided in an urban place at each date. There was a change from a little less than half of all African households residing in urban places in 1998 to a little less than 60% of African households residing in urban places in 2006. The overwhelmingly urban residence of non-African households raises the percent of households in urban places in 2006 from 57% for all African households to 65% for all households, countering the common impression that data for all South African households are similar to data for all African households.



	1998	1999	2000	2001	2002	2003	2004	2005	2006
African	48.4	50.4	49.4	49.7	51.3	52.2	50.4	56.6	57.2
Coloured	83.2	81.7	79.5	79.8	81.4	81.1	80.8	91.3	91.1
White or Asian	94.5	92.7	92.6	91.8	91.7	91.5	91.0	94.8	95.3
All South Africans	60.1	60.4	59.0	58.9	59.7	60.3	59.1	65.1	65.4

Figure 2. Percent living in urban places

As shown in Figure 3, at every date over 92% of all rural households had an African household head. Thus, almost all rural households in South Africa have an African household head.

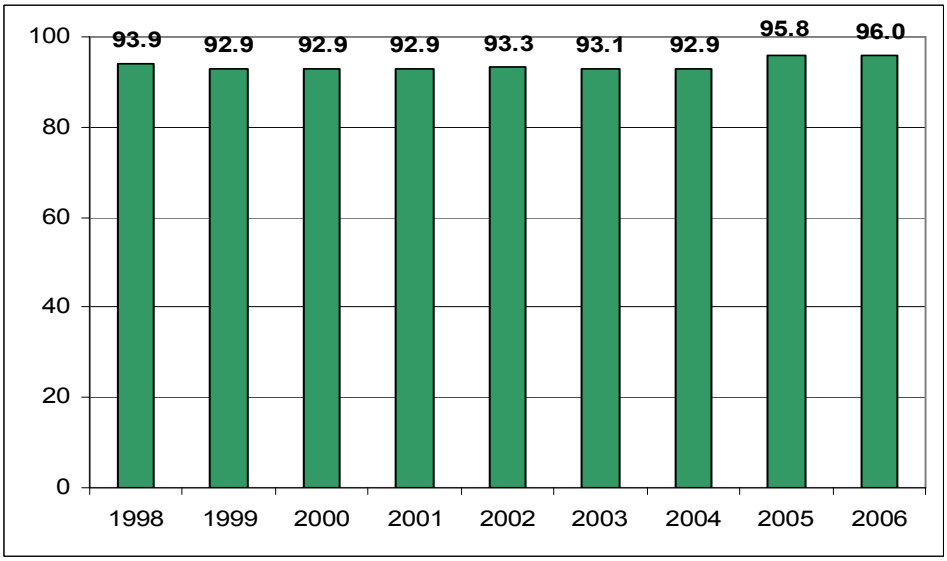


Figure 3. African households as a percent of all rural households

In the unweighted data for the 2006 General Household Survey, there were 10,413 urban African households surveyed and 11,308 rural African households surveyed. As shown in Figure 2, African households are about evenly divided between rural and urban location and, as we shall see, African rural and urban households differ markedly in almost all household characteristics.

There were only 623 rural Coloured households and 335 White or Asian rural households in the unweighted data for the 2006 General Household Survey. There was

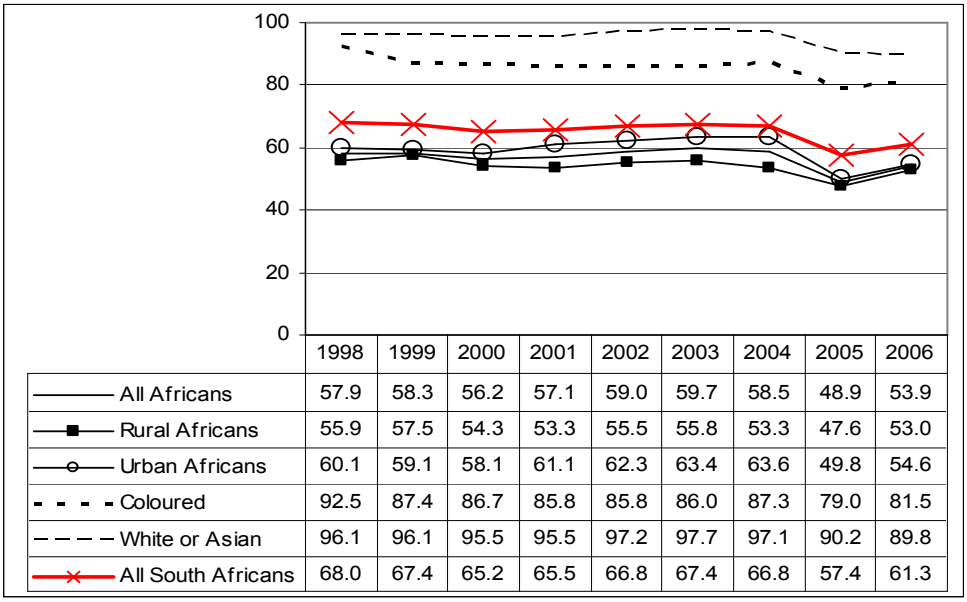
a similarly small number of rural Coloured households and of rural White or Asian households in the surveys used for other years. Due to the small number of Coloured households and of White or Asian households in the surveys, as well as the overwhelmingly urban location of Coloured households and of White or Asian households, the analysis is done for all Coloured households and for all White or Asian households, without division into rural and urban location.

In the rest of the paper, first we look at changes over time for population groupings (African households, rural African households, urban African households, Coloured households and White or Asian households) in each separate aspect of standard of living that we consider: type of housing, access to a telephone, lighting source, cooking source, source of drinking water and type of sanitation. Then we combine aspects of standard of living to define the four standard of living or social status groups.

Type of Housing

The type of housing in which a household resides matters for the household's well-being. Housing types differ in their sturdiness and protection from the elements. Formal housing generally performs better in these areas than other types of housing.

Formal housing is defined as living in any of the following situations: in a formal structure on a separate stand, in a flat in a block of flats, in a townhouse or semi-detached house. In some surveys living in a unit in a retirement village was listed as a separate category. When a retirement unit was listed as an option, it also was included as formal housing.



	1998	1999	2000	2001	2002	2003	2004	2005	2006
All Africans	57.9	58.3	56.2	57.1	59.0	59.7	58.5	48.9	53.9
Rural Africans	55.9	57.5	54.3	53.3	55.5	55.8	53.3	47.6	53.0
Urban Africans	60.1	59.1	58.1	61.1	62.3	63.4	63.6	49.8	54.6
Coloured	92.5	87.4	86.7	85.8	85.8	86.0	87.3	79.0	81.5
White or Asian	96.1	96.1	95.5	95.5	97.2	97.7	97.1	90.2	89.8
All South Africans	68.0	67.4	65.2	65.5	66.8	67.4	66.8	57.4	61.3

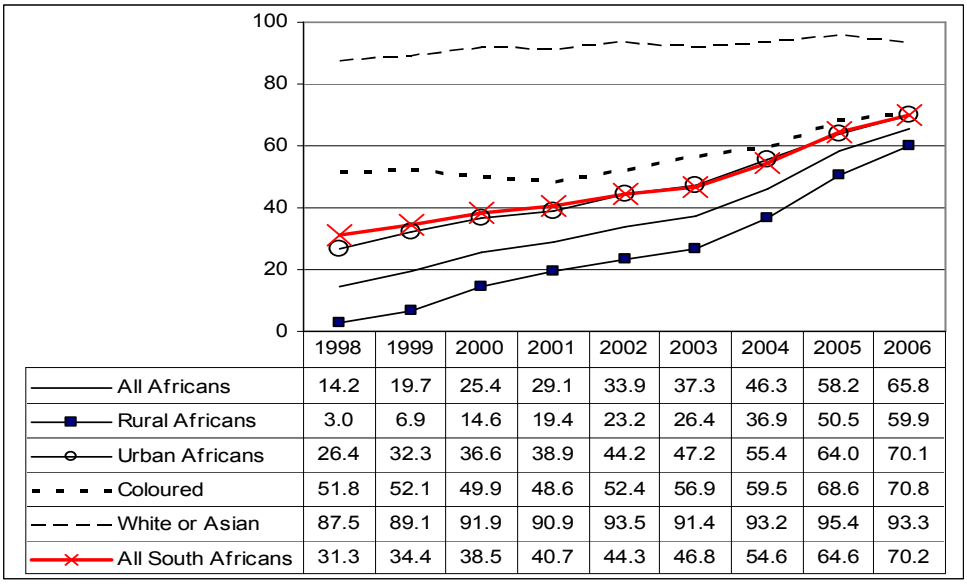
Figure 4. Percent residing in formal housing

Figure 4 shows the percent of households with formal housing over time. There appears to be very little change over time in the percent of households in formal housing, overall or by population grouping, except for a slight decline in the percent

recorded as in formal housing after 2004. We do not think that the reported dip in the reported percent living in formal housing in 2005 and, to a lesser extent in 2006, reflects a real change. Rather, we think that it is the result of a combination of random variability and perhaps some variation in interviewer training. The main reason we are looking at whether a household resides in formal housing is to use it as a part of the definition of standard of living groups.

Telephone in Household

Access to a telephone provides a means of communication for household members for both personal and business purposes. It is better to have a public telephone available close to the home than far away, but only with a telephone in the home or in the possession of a household member is it possible to receive calls easily, without prearranging the time a call will be received.



	1998	1999	2000	2001	2002	2003	2004	2005	2006
All Africans	14.2	19.7	25.4	29.1	33.9	37.3	46.3	58.2	65.8
Rural Africans	3.0	6.9	14.6	19.4	23.2	26.4	36.9	50.5	59.9
Urban Africans	26.4	32.3	36.6	38.9	44.2	47.2	55.4	64.0	70.1
Coloured	51.8	52.1	49.9	48.6	52.4	56.9	59.5	68.6	70.8
White or Asian	87.5	89.1	91.9	90.9	93.5	91.4	93.2	95.4	93.3
All South Africans	31.3	34.4	38.5	40.7	44.3	46.8	54.6	64.6	70.2

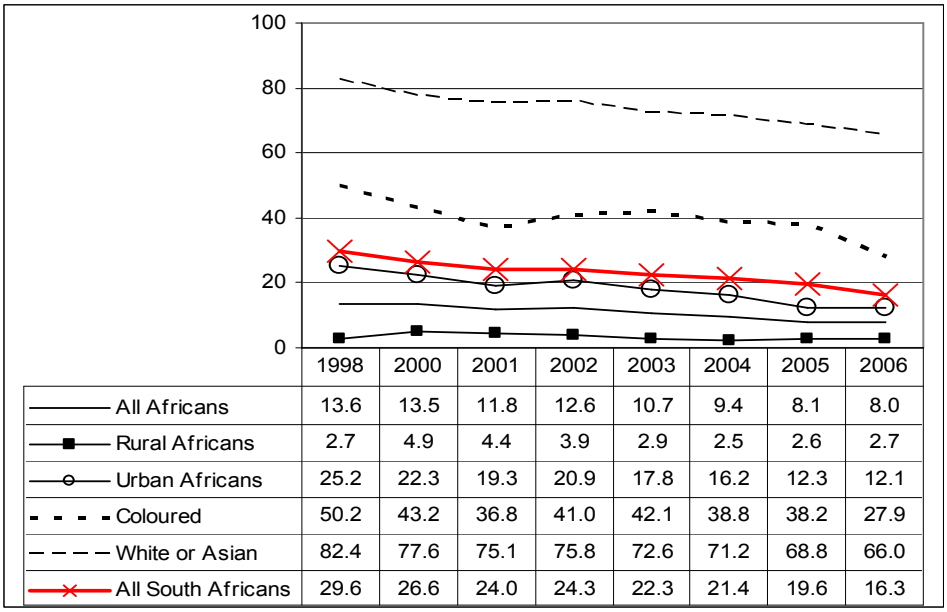
Figure 5. Percent with a landline in dwelling or a household member with a cell phone

Figure 5 shows the percent of households which had a landline phone or in which a household member had a cell phone. The increase over time in the percent of households that either had a landline phone or in which a household member had a cell phone is impressive.

The percent with a landline or with a household member with a cell phone more than doubled for South African households as a whole between 1998 and 2006, more than quadrupled for all Africans, and increased by almost twentyfold for rural Africans, yielding an annual rate of increase 1998-2006 for rural Africans of 37%. The only group for which the increase was not large was White or Asian households; over 85% of White or Asian households had a landline or a cell phone in the household at all dates, and in 2006 over 93% of White or Asian households had a landline or cell phone. Thus, much further increase in the availability of a telephone for White or Asian households was not possible.

This increase in phones in African households is overwhelmingly due to the spread of cell phones. Figure 6 shows the proportion of households that had a landline telephone in the dwelling.[4] In 2006, 8% of all African households had a landline phone.

Before 1999 cell phones were rare. In 1998, 95% of all households that had either a landline or a cell phone had a landline; in 2000 only 69% of households with a landline or a cell phone had a landline. The rise in the availability of phones for African households shown in Figure 5 is almost completely due to the increase in availability of cell phones. The spread of cell phones and the resulting improvement in phone access in rural areas was the result of the success of commercial cell phone companies.



	1998	2000	2001	2002	2003	2004	2005	2006
All Africans	13.6	13.5	11.8	12.6	10.7	9.4	8.1	8.0
Rural Africans	2.7	4.9	4.4	3.9	2.9	2.5	2.6	2.7
Urban Africans	25.2	22.3	19.3	20.9	17.8	16.2	12.3	12.1
Coloured	50.2	43.2	36.8	41.0	42.1	38.8	38.2	27.9
White or Asian	82.4	77.6	75.1	75.8	72.6	71.2	68.8	66.0
All South Africans	29.6	26.6	24.0	24.3	22.3	21.4	19.6	16.3

Figure 6. Percent with a landline telephone in dwelling

There are several reasons for the popularity of cell phones. Cell phones were workable in areas in which a landline was not available, such as in many rural areas. This is probably one reason for the predominance of cell phones for African households, especially for rural African households. Also a cell phone could be purchased just by having the needed cost. Even without the credit necessary for a cell phone contract, pay-as you- go schemes allowed purchase of cell phone tie, without presenting evidence of the purchaser's financial situation. Even when a household wanted a landline, there were widespread reports of long delays in locales where landline service was available, and in many rural areas, landline service was not possible. In 2006, while 60% of rural African households had a landline or a cell phone, less than 3% of rural African households had a landline. At no date did more than 5% of rural African households or more than 26% of urban African households have a landline.

Note that in Figure 6 the percent of households with a landline declined to some extent for all groups, including White or Asian households. Between 1998 and 2006, possession of a landline in the dwelling declined at an annual rate of 7% for all South

[4] No data are shown in Figure 5 for 1999 because in that year the Labour Force Survey only asked whether the given household had a landline or a cell phone and did not ask about landlines and cell phones separately.

African households and declined at an annual rate of 3% for White or Asian households. For rural African households, the presence of a landline increased slightly between 1998 and 2000 and then declined to below its 1998 level. Thus, some households that had a landline at one time let that landline go once at least one household member had a cell phone, whether due to the greater convenience of cell phones, the lower operating cost of cell phones or some other reason. The South African press has reported that many households have given up their landline phones. It has been reported that a major reason why some households have retained their landlines has been to gain fast internet access ("Telkom customers hang up," 2007).

Figure 7 shows that telephone access also improved for those with the least access. Between 1998 and 2006, the percent of households that needed to travel more than 15-16 minutes to reach an accessible telephone declined by more than 51% for all South African households and by more than 57% for rural African households.[5] This represents a substantial improvement in telephone access among those with the least access. The proliferation of cell phone points (commercial establishments where time on a cell phone can be purchased), including in rural areas, has almost certainly played a major role in this improved access.

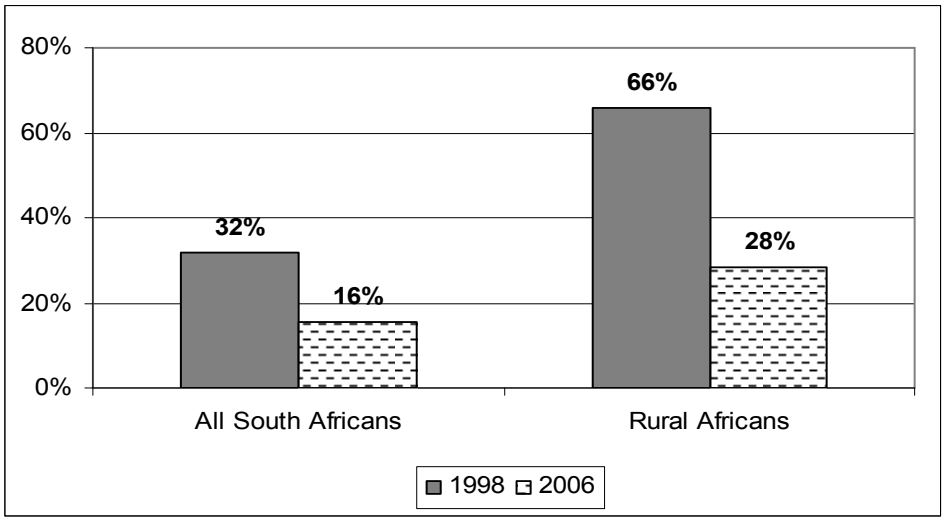


Figure 7. Percent of all South Africans and rural Africans more than 15-16 minutes from an accessible telephone: 1998 and 2006

The Main Lighting Source – Electricity and Candles

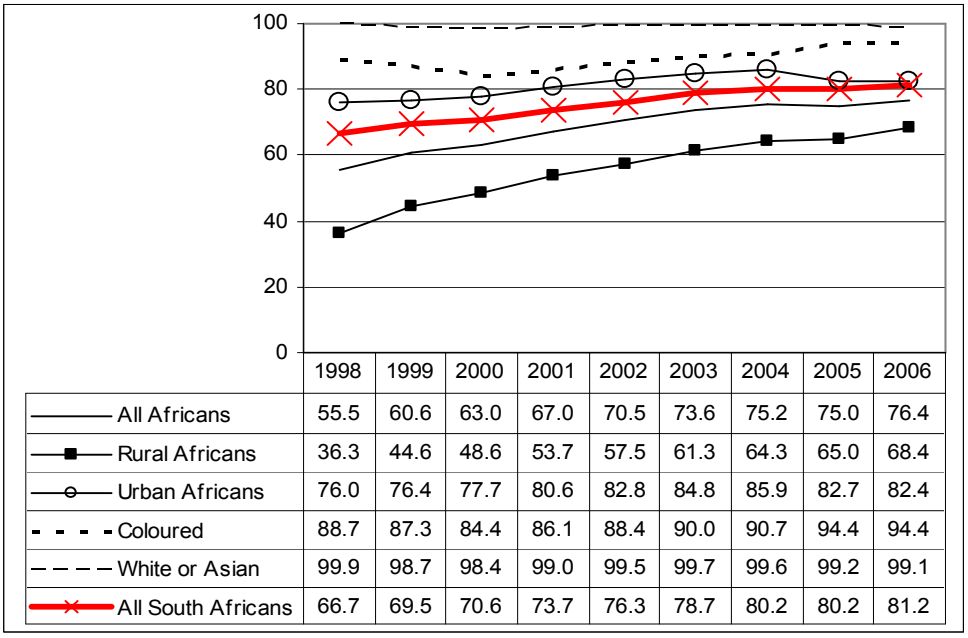
Electricity is the most desirable lighting source. With a secure connection, it is always available. Also, unlike sources such as candles, wood or kerosene, it does not add to air pollution in the vicinity of the household. Candles are probably the least desirable lighting source. In this section we look at the increase in use of electricity for lighting and the decrease in the use of candles for lighting in South Africa since 1998.

There has been a major effort to extend electrification to an ever increasing proportion of South African households. In 1994, the South African government set a

[5] The categories in the 1998 OHS and the 2006 GHS were slightly different. Thus, being 16+ minutes from a phone in 1998 is compared with being 15+ minutes from a phone in 2006.

target to have 2.5 million households newly connected to an electricity source by 2000. The South African government also has targeted 2012 as the year by which all South African homes will have access to electricity (ESKOM, 2007).

Figure 8 shows the percent of households in which electricity is the main lighting source. It is clear that the percent of households with electricity as the main lighting source has risen considerably for all groups except White or Asian households, for whom over 98% of households used electricity as the main lighting source at all dates. For all African households, the value for 2006 is 138% that of 1998. For rural African households, the percent of households with electricity as the main housing source in 2006 was 188% of the 1998 value. Since 2003, ESKOM made an increased effort to extend electrification to households in deep rural areas (ESKOM, 2007). By 2005, the percent of Coloured households with electricity as the main lighting source was nearly as high as for White or Asian households.



	1998	1999	2000	2001	2002	2003	2004	2005	2006
All Africans	55.5	60.6	63.0	67.0	70.5	73.6	75.2	75.0	76.4
Rural Africans	36.3	44.6	48.6	53.7	57.5	61.3	64.3	65.0	68.4
Urban Africans	76.0	76.4	77.7	80.6	82.8	84.8	85.9	82.7	82.4
Coloured	88.7	87.3	84.4	86.1	88.4	90.0	90.7	94.4	94.4
White or Asian	99.9	98.7	98.4	99.0	99.5	99.7	99.6	99.2	99.1
All South Africans	66.7	69.5	70.6	73.7	76.3	78.7	80.2	80.2	81.2

Figure 8. Percent with electricity as the main lighting source

South Africa recommended provision of free basic electricity to people in 2001. The intention of this recommendation was to help poor households afford electricity (DME, 2007). This program has operated through municipalities and has not been implemented in all locales.

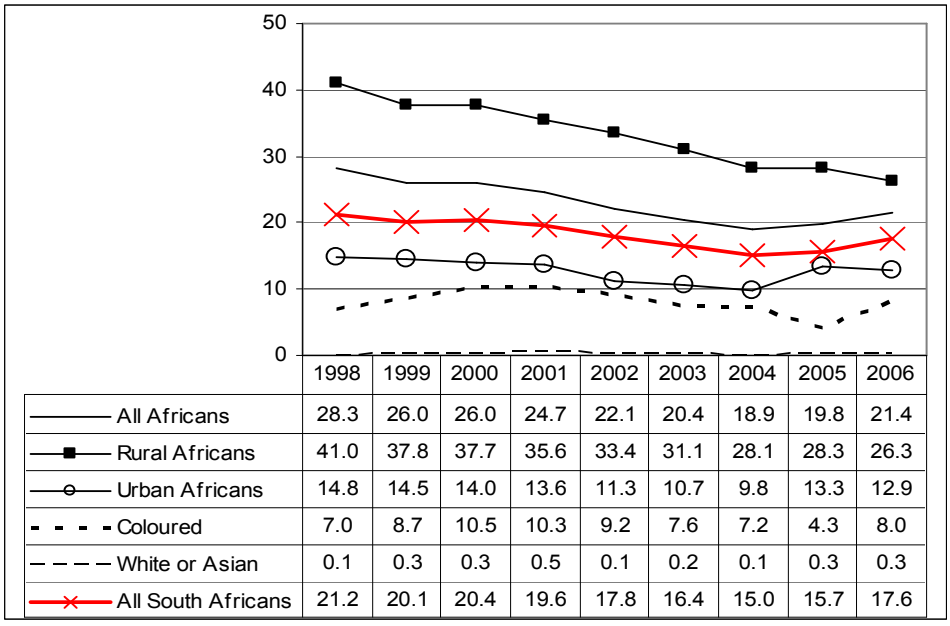
Table 3. Among households connected to MAINS electricity in 2004, the percent who said they received free electricity

Africans	Rural Africans	Urban Africans	Coloured	White or Asian	All South Africans
22.7%	13.2%	29.9%	50.5%	25.4%	25.7%

Table 3 shows the percent of households who stated that they had free electricity in 2004. Free MAINS electricity has been available to a higher percent of Coloured households than to any other group, including urban African households.

The greater provision of free electricity to Coloured households than to other population groups is related to the greater provision of free MAINS electricity in Western Cape Province than in other provinces. In 2004, 21% of all South African households reported that they received free MAINS electricity. The highest provincial percent was for Western Cape Province at 60%, and the next highest was for Free State Province at 35%.

We next look at what has happened over time in the prevalence of the use of the least desirable lighting source, candles. Figure 9 shows the percent of households over time that used candles as the main lighting source.



	1998	1999	2000	2001	2002	2003	2004	2005	2006
All Africans	28.3	26.0	26.0	24.7	22.1	20.4	18.9	19.8	21.4
Rural Africans	41.0	37.8	37.7	35.6	33.4	31.1	28.1	28.3	26.3
Urban Africans	14.8	14.5	14.0	13.6	11.3	10.7	9.8	13.3	12.9
Coloured	7.0	8.7	10.5	10.3	9.2	7.6	7.2	4.3	8.0
White or Asian	0.1	0.3	0.3	0.5	0.1	0.2	0.1	0.3	0.3
All South Africans	21.2	20.1	20.4	19.6	17.8	16.4	15.0	15.7	17.6

Figure 9. Percent of households using candles as the main lighting source

Candles are most prevalent at all dates as the source of lighting among rural African households, for whom their use declined by 32% between 1998 and 2004. There was some fluctuation in reported candle use among urban African households and Coloured households. However, at no date did the percent of urban African households using candles exceed 15% nor of Coloured households using candles exceed 11%.

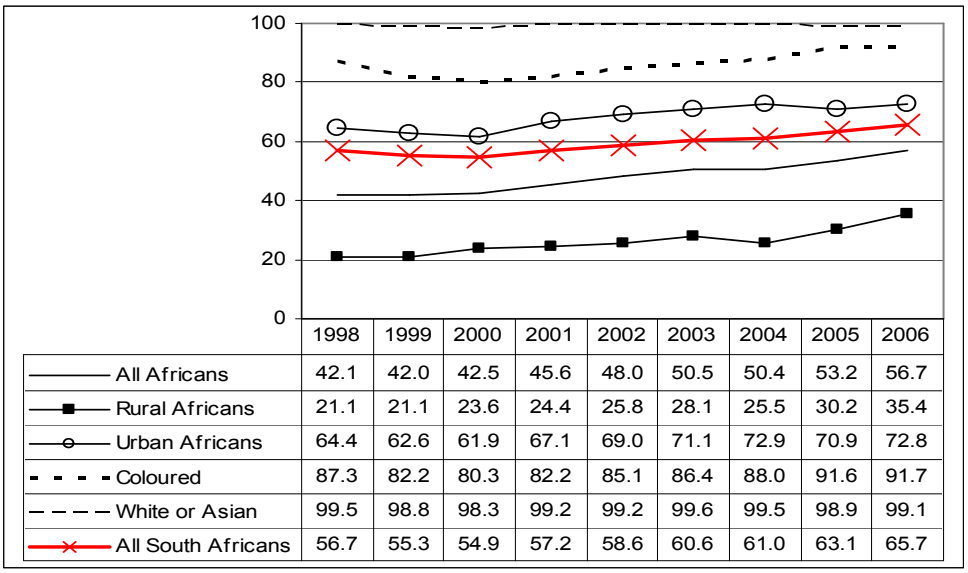
Electricity or Gas as a Cooking Source

Electricity and gas are considered desirable cooking sources. With a reliable source, electricity and gas are dependable and non-polluting (in the case of electricity) or pollute at a very low level (in the case of gas).

Figure 10 shows the percent of households in which electricity or gas was the main cooking source. Gas comprised a small portion of this use; in 2006, over 96% of the households for whom electricity or gas was the main cooking source used electricity as the main cooking source.

At all dates, the vast majority of White or Asian households (over 98%) used electricity or gas as the main cooking source. Also, Coloured households increasingly used electricity or gas as the main cooking source, reaching 92% in 2005.

For Africans, the picture in Figure 10 is different from that in Figure 7. For all African households, between 1998 and 2006 use of electricity for lighting increased by 38%, but use of electricity or gas for cooking increased by 35%. For rural African households, the increase between 1998 and 2006 in electricity for lighting was 88%, but for use of electricity or gas for cooking was 68%.



	1998	1999	2000	2001	2002	2003	2004	2005	2006
All Africans	42.1	42.0	42.5	45.6	48.0	50.5	50.4	53.2	56.7
Rural Africans	21.1	21.1	23.6	24.4	25.8	28.1	25.5	30.2	35.4
Urban Africans	64.4	62.6	61.9	67.1	69.0	71.1	72.9	70.9	72.8
Coloured	87.3	82.2	80.3	82.2	85.1	86.4	88.0	91.6	91.7
White or Asian	99.5	98.8	98.3	99.2	99.2	99.6	99.5	98.9	99.1
All South Africans	56.7	55.3	54.9	57.2	58.6	60.6	61.0	63.1	65.7

Figure 10. Percent with electricity or gas as main cooking source

Table 4 shows for 2006, among households in which electricity was the main lighting source, the percent for whom electricity or gas was the main cooking source. For Coloured and for White or Asian households using electricity for lighting almost always (more than 96%) meant that the household also used electricity or gas as the main cooking source. In contrast, among African households that used electricity as the main lighting source, only 73% used electricity or gas as the main cooking source, and among rural African households, only 50% of those that used electricity as the main lighting source used electricity or gas as the main cooking source.

Table 4. Among households with electricity as the main lighting source, the percent who use electricity or gas as the main cooking source, 2006 General Household Survey

Africans	Rural Africans	Urban Africans	Coloured	White or Asian
73.0%	50.1%	87.2%	96.4%	99.8%

There are three likely reasons for the gap between use of electricity for lighting and use of electricity or gas for cooking among African households. First, many African households use heat from the stove (using coal or wood) for heating in the winter, even if the household owns an electric or gas stove. Second, some African households with electricity do not own an electric or gas stove, perhaps due to the cost. Third, beyond a

basic allotment in areas in which there is free electricity available, households pay for electricity.

In the formulation of the free basic electricity program, it is recommended that 50kWh per month be made available to each participating household. This amount of electricity was estimated to be sufficient for "…basic lighting, small black and white TV, small radio, basic ironing and basic water boiling through an electric kettle for grid-connected consumers" (DME, 2007). Although a relatively small amount of electricity is used by lights, cooking requires much more electricity.

Among African households that used electricity as the main lighting source and who did not use electricity or gas as the main cooking source, 44% used wood for cooking, 39% used paraffin, 12% used coal, and 5% used some other source of fuel (animal dung or other). Wood and coal stoves generate quite a bit of heat, but paraffin stoves do not. Paraffin stoves were probably used due to economy considerations rather than for heating.

Interestingly, in 2005 among African households with electricity as the main lighting source, but who do not use electricity or gas as the main cooking source, 42% reported they owned a gas or electric stove.[6] For these households, the gas or electric stove is used sometimes, but not as the main cooking source, due to cost, the need for the cooking source to supply heat in the winter, or for both reasons. If all African households with electricity as the main lighting source who also owned an electric or gas stove stated that gas or electricity was their main cooking source, then in 2005 62% of African households would have reported they used electricity or gas as their main cooking source rather than 53%.

Clearly if a household owned a gas or electric stove, then gas or electricity was used for cooking at least part of the time. If more than one source is used for cooking, then it is somewhat subjective which source is identified as the ***main*** source. The fieldwork for the General Household Surveys occurs in July, which is winter in South Africa. Households that use an electric or gas stove in summer but a wood or coal stove in winter might be more likely to state that they do not use electricity or gas as the main source of fuel for cooking when answering this question in the winter than they would if they answered this question in the summer.

Main Source of Drinking Water

Clean drinking water is important for overall health and plays a substantial role in infant and child health and survival (Anderson *et al*., 2002, Fewtrell *et al*., 2005 Ross *et al*., 1988). Persons with compromised immune systems, such as those with AIDS, are especially vulnerable to water-borne infections, even those which are not typically threatening to healthy individuals (Laurent, 2005: 6).

The South African Constitution states that all South Africans have the right to a healthy environment (Constitution of South Africa, Chap.2, Sec. 24), an important component of which is access to clean drinking water. Extending the availability of clean drinking water to all South Africans has been a major South African government goal (DWAF, 1994: 1; 2003a: 1). In addition, inequity among population groups in the quality

[6] No question about possession of a gas or electric stove was asked in the 2006 GHS.

of the sources of drinking water, especially in the availability of piped water, has been a concern from the founding of the Department of Water Affairs and Forestry (DWAF 1994: 3-4).

Part of the stated mission of the Department of Water Affairs and Forestry (DWAF) is "…ensuring that water services are provided to all South Africans in an efficient, cost-effective and sustainable manner" (DWAF, 2007). As of 2003, the goal was that all South Africans would have access to clean drinking water by 2008 (DWAF, 2003a: 6). Improving the source of drinking water available to households also has been a focus of the Millennium Development Goals, and, according to the UN, the source of drinking water is an integral part of defining whether a household lives in absolute poverty (UN, 2000: paragraph 18, chapter 2).

Table 5 shows the classification into five categories of source of drinking water, using terms of the items available in the surveys used. Of course, the water that comes from a tap is not necessarily clean, and the water from a well or a stream could be clean. However, the classification employed here is that which has typically been used in South Africa to classify drinking water sources as clean or not. This classification is also consistent with the DWAF view of the water ladder, which involves a target first of providing households with clean drinking water and then moving to provide an increasing proportion of households with a fairly desirable source of drinking water, such as a tap on site (DWAF, 2003a).

Table 5. Classification of types of drinking water source according to the categories in the surveys used

Tap in Dwelling	Water tap in dwelling
Tap on Site	Water tap on site, such as in the yard
Other Clean water	Neighbour's tap, public tap, water tanker
Borehole Well	Borehole, well, rainwater tank
Stream Dam Pond	Stream, dam, pond, river, pool, stagnant water, other

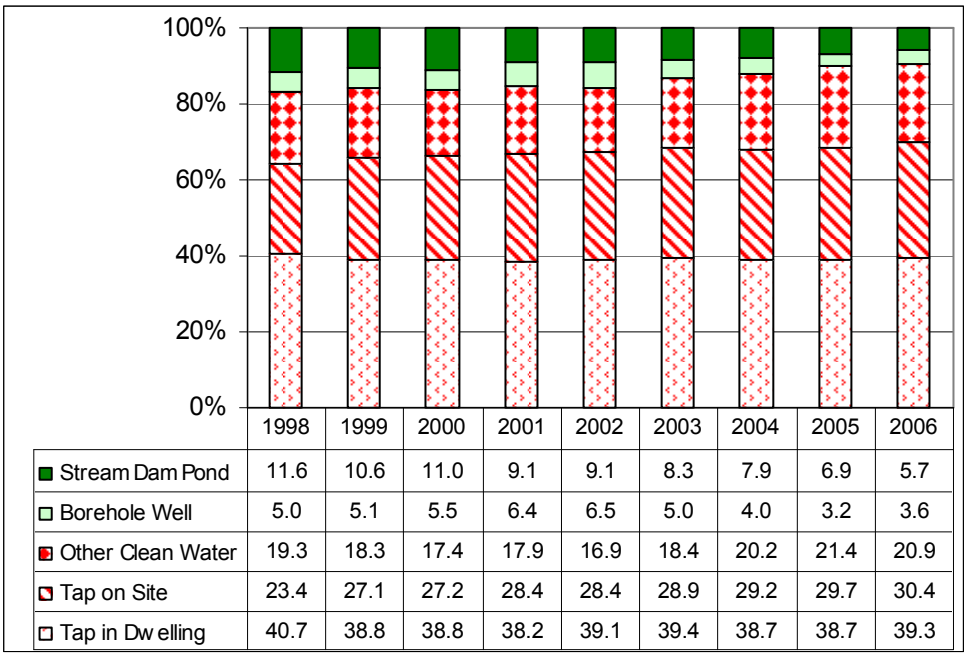
The perceptions by South Africans of the cleanliness of various water sources are consistent with this classification. Table 6 shows for 2005 the percent of South African households who view their main source of drinking water as: (1) safe to drink, (2) clear (no colour or mud), (3) good in taste, and (4) free from bad smells, according to the five types of drinking water source used in this study.

Table 6. Perceptions of characteristics of main source of drinking water according to category of drinking water source, 2005

	Tap in Dwelling	Tap on Site	Other Clean Water	Borehole Well	Stream Dam Other
% water safe to drink	98%	97%	95%	73%	30%
% water clear	97%	96%	94%	75%	36%
% water good in taste	97%	96%	91%	67%	36%
% water free from bad smells	97%	96%	93%	73%	39%

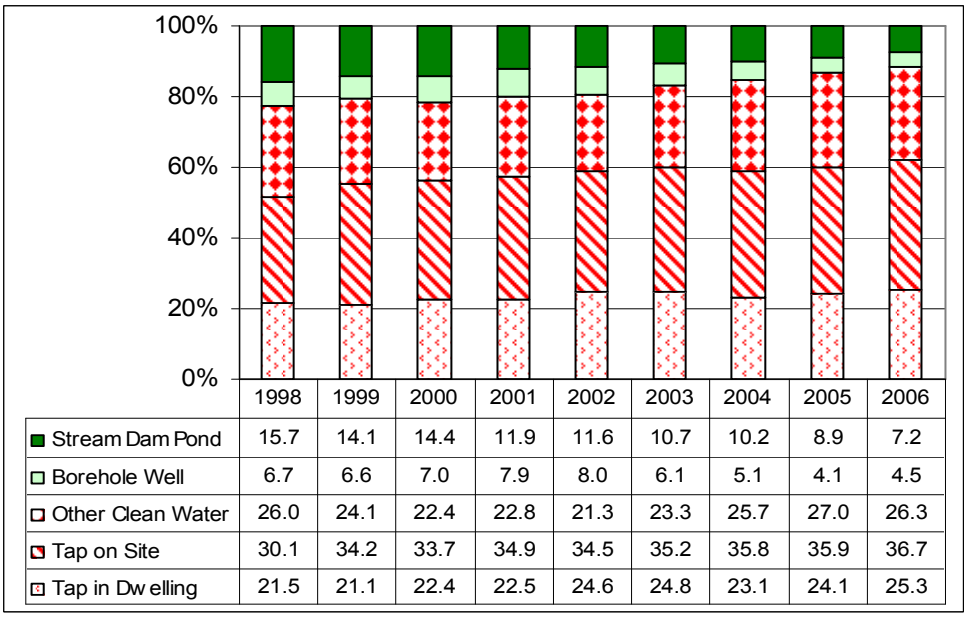
The sources of water considered clean in this paper are consistently more likely to be viewed as clean by survey respondents than are those sources viewed as not clean. In fact, the ordering of sources of drinking water in Table 5 corresponds completely with the ordering of the extent to which people perceive water as safe to drink, clear, good in taste and free of bad smells shown in Table 6.

Figure 11 shows the distribution of sources of drinking water for all South African households by year 1995-2006. In Figures 11-16 the three categories of clean water are indicated by red patterns, and the two not clean categories of sources of drinking water are indicated by light and by dark solid green.



	1998	1999	2000	2001	2002	2003	2004	2005	2006
Stream Dam Pond	11.6	10.6	11.0	9.1	9.1	8.3	7.9	6.9	5.7
Borehole Well	5.0	5.1	5.5	6.4	6.5	5.0	4.0	3.2	3.6
Other Clean Water	19.3	18.3	17.4	17.9	16.9	18.4	20.2	21.4	20.9
Tap on Site	23.4	27.1	27.2	28.4	28.4	28.9	29.2	29.7	30.4
Tap in Dwelling	40.7	38.8	38.8	38.2	39.1	39.4	38.7	38.7	39.3

Figure 11. Drinking water source for all South African households



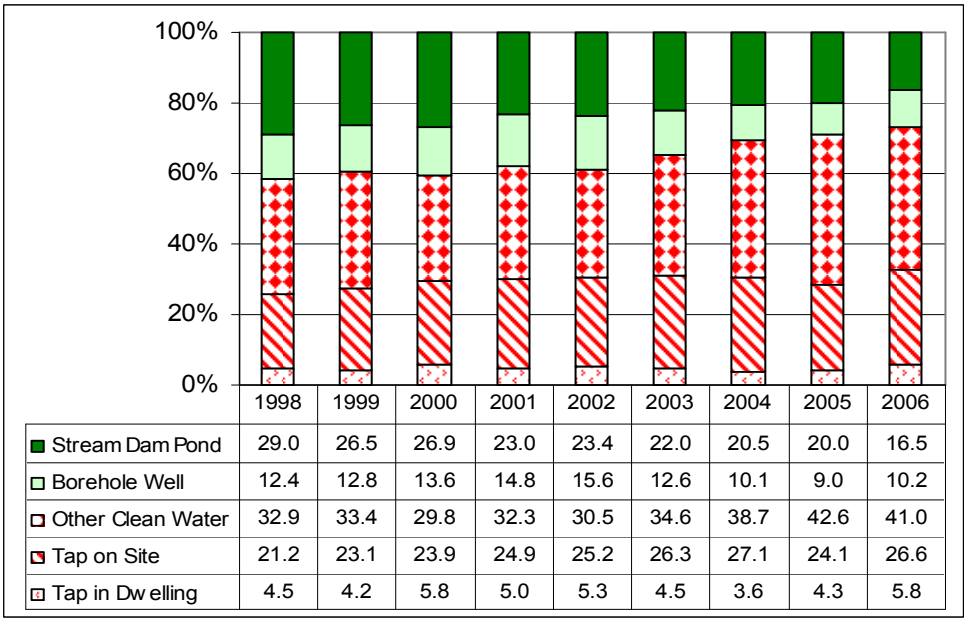
	1998	1999	2000	2001	2002	2003	2004	2005	2006
Stream Dam Pond	15.7	14.1	14.4	11.9	11.6	10.7	10.2	8.9	7.2
Borehole Well	6.7	6.6	7.0	7.9	8.0	6.1	5.1	4.1	4.5
Other Clean Water	26.0	24.1	22.4	22.8	21.3	23.3	25.7	27.0	26.3
Tap on Site	30.1	34.2	33.7	34.9	34.5	35.2	35.8	35.9	36.7
Tap in Dwelling	21.5	21.1	22.4	22.5	24.6	24.8	23.1	24.1	25.3

Figure 12. Drinking water source for African households

In Figure 11, it is clear that use of the worst source of drinking water (stream dam other) has become less common over time, declining from 12% in 1998 to 6% in 2006.

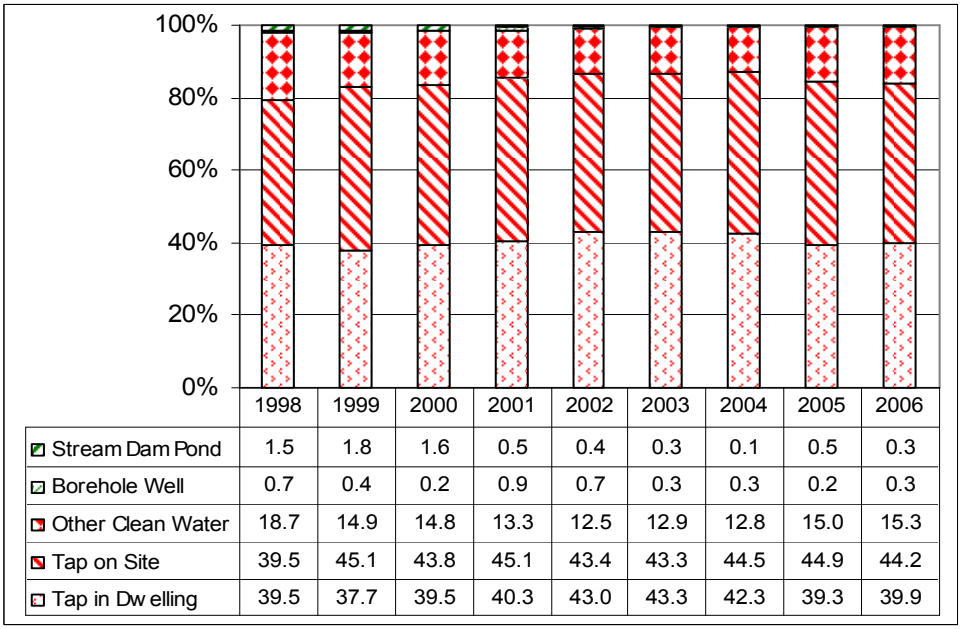
Also the percent of all South African households which used a clean source of drinking water has increased, from 83% in 1998 to 89% in 2006. This was mainly due to an increase in the percent of households with a tap on site, which increased by 30% between 1998 and 2006.

Figure 12 shows that for African households there has been a decline in the percent of households with the worst source of drinking water (from 16% to 7%) and an increase in the percent with clean water (from 78% to 87%).



	1998	1999	2000	2001	2002	2003	2004	2005	2006
Stream Dam Pond	29.0	26.5	26.9	23.0	23.4	22.0	20.5	20.0	16.5
Borehole Well	12.4	12.8	13.6	14.8	15.6	12.6	10.1	9.0	10.2
Other Clean Water	32.9	33.4	29.8	32.3	30.5	34.6	38.7	42.6	41.0
Tap on Site	21.2	23.1	23.9	24.9	25.2	26.3	27.1	24.1	26.6
Tap in Dw elling	4.5	4.2	5.8	5.0	5.3	4.5	3.6	4.3	5.8

Figure 13. Drinking water source for rural African households

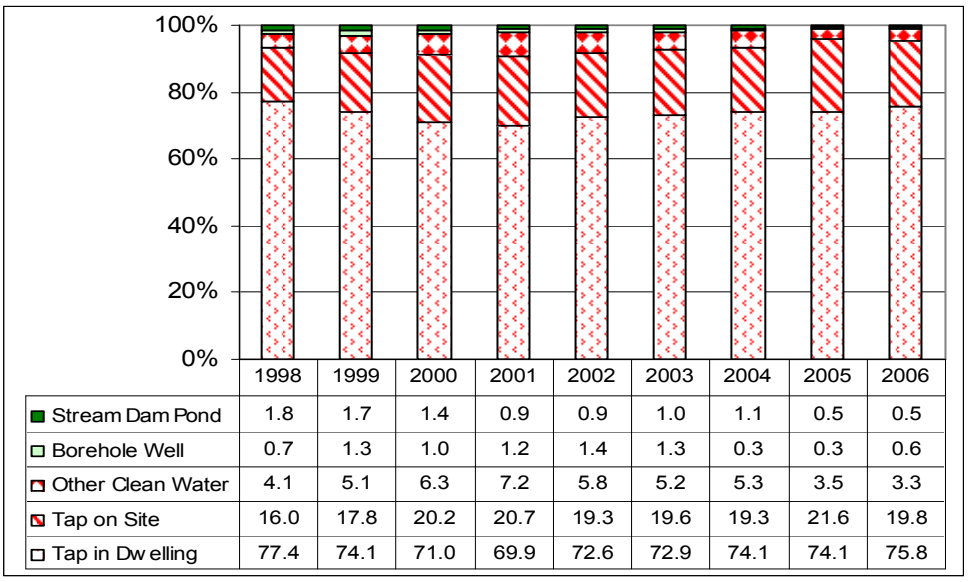


	1998	1999	2000	2001	2002	2003	2004	2005	2006
Stream Dam Pond	1.5	1.8	1.6	0.5	0.4	0.3	0.1	0.5	0.3
Borehole Well	0.7	0.4	0.2	0.9	0.7	0.3	0.3	0.2	0.3
Other Clean Water	18.7	14.9	14.8	13.3	12.5	12.9	12.8	15.0	15.3
Tap on Site	39.5	45.1	43.8	45.1	43.4	43.3	44.5	44.9	44.2
Tap in Dw elling	39.5	37.7	39.5	40.3	43.0	43.3	42.3	39.3	39.9

Figure 14. Drinking water source for urban African households

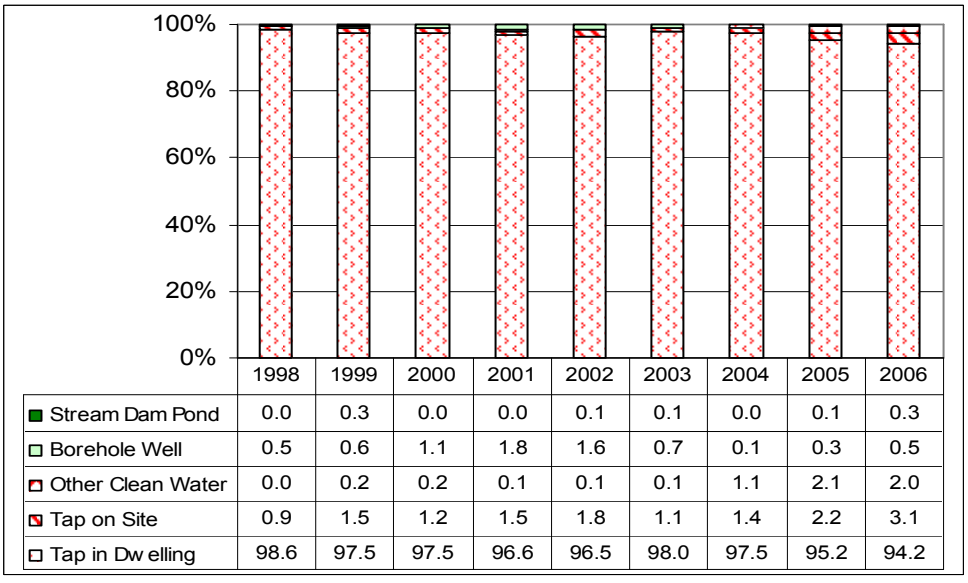
Figures 13 and 14 show the source of drinking water for rural African households and for urban African households, respectively. Figure 13 shows a decline in the percent with the worst water source from 29% in 1998 to 20% in 2006 – a decline of 31%. The decline in the worst water situation was due to an increase of 25% in other clean water (such as a public tap) and to an increase of 25% in tap on site. At all dates less than 6 percent of rural African households had a tap in dwelling.

Almost all urban African households had clean drinking water at all dates. For urban African households, there was an increase of 6% in those having a tap in the dwelling or a tap on site between 1998 and 2006. In 2006, although 84% of urban African households had a tap either in their dwelling or on site, more than half of those households had the tap on site (in the yard).



	1998	1999	2000	2001	2002	2003	2004	2005	2006
Stream Dam Pond	1.8	1.7	1.4	0.9	0.9	1.0	1.1	0.5	0.5
Borehole Well	0.7	1.3	1.0	1.2	1.4	1.3	0.3	0.3	0.6
Other Clean Water	4.1	5.1	6.3	7.2	5.8	5.2	5.3	3.5	3.3
Tap on Site	16.0	17.8	20.2	20.7	19.3	19.6	19.3	21.6	19.8
Tap in Dwelling	77.4	74.1	71.0	69.9	72.6	72.9	74.1	74.1	75.8

Figure 15. Drinking water source for Coloured households



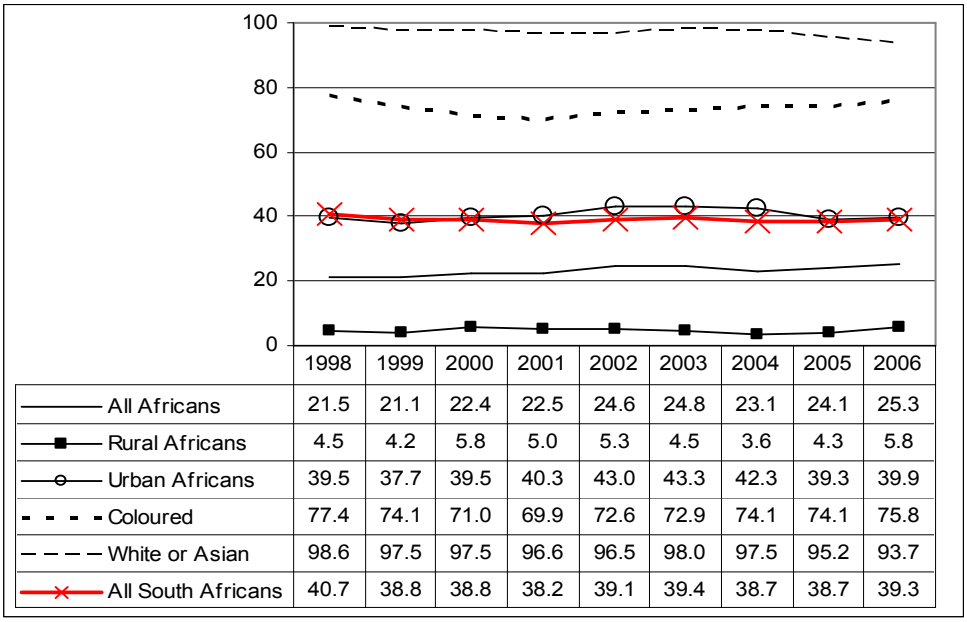
	1998	1999	2000	2001	2002	2003	2004	2005	2006
Stream Dam Pond	0.0	0.3	0.0	0.0	0.1	0.1	0.0	0.1	0.3
Borehole Well	0.5	0.6	1.1	1.8	1.6	0.7	0.1	0.3	0.5
Other Clean Water	0.0	0.2	0.2	0.1	0.1	0.1	1.1	2.1	2.0
Tap on Site	0.9	1.5	1.2	1.5	1.8	1.1	1.4	2.2	3.1
Tap in Dwelling	98.6	97.5	97.5	96.6	96.5	98.0	97.5	95.2	94.2

Figure 16. Drinking water source for White or Asian households

Figure 15 shows the situation for Coloured households. Almost all Coloured households had clean water at all dates, and there was little change in the percent with a water tap in the dwelling, being 70-77% in every year. It is notable that the sources of drinking water were considerably better for Coloured households than for urban African households – in 2006, 76% of Coloured households but only 40% of urban African households had a water tap in their dwelling.

Figure 16 shows the sources of drinking water for White or Asian households. At every date, over 95% of White or Asian households had a tap in the dwelling.

Figure 17 summarizes the percent with a tap in dwelling over time by group. There was little change over time for any group.

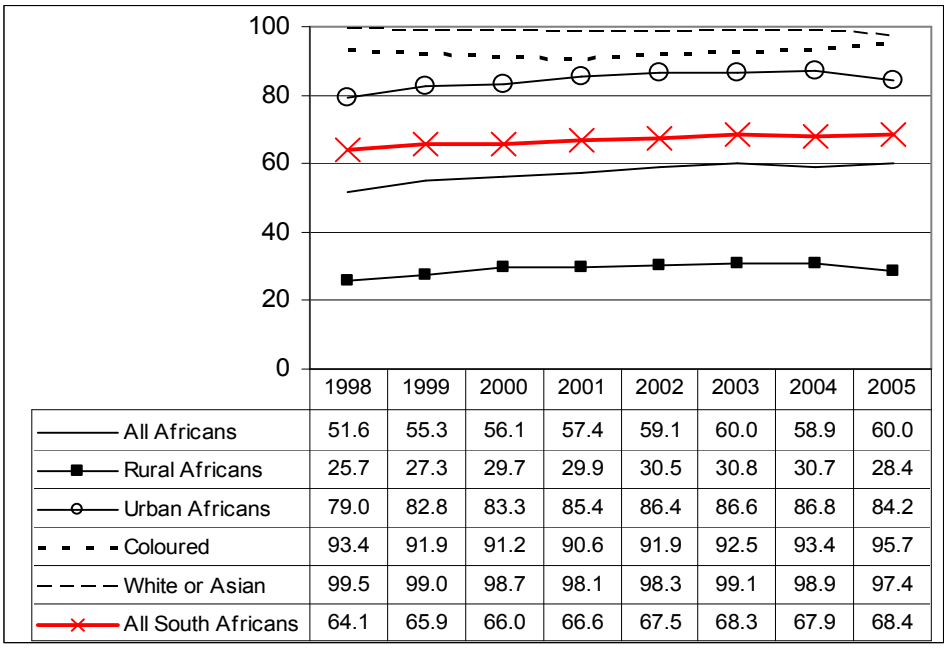


	1998	1999	2000	2001	2002	2003	2004	2005	2006
All Africans	21.5	21.1	22.4	22.5	24.6	24.8	23.1	24.1	25.3
Rural Africans	4.5	4.2	5.8	5.0	5.3	4.5	3.6	4.3	5.8
Urban Africans	39.5	37.7	39.5	40.3	43.0	43.3	42.3	39.3	39.9
Coloured	77.4	74.1	71.0	69.9	72.6	72.9	74.1	74.1	75.8
White or Asian	98.6	97.5	97.5	96.6	96.5	98.0	97.5	95.2	93.7
All South Africans	40.7	38.8	38.8	38.2	39.1	39.4	38.7	38.7	39.3

Figure 17. Percent of households with water tap in dwelling

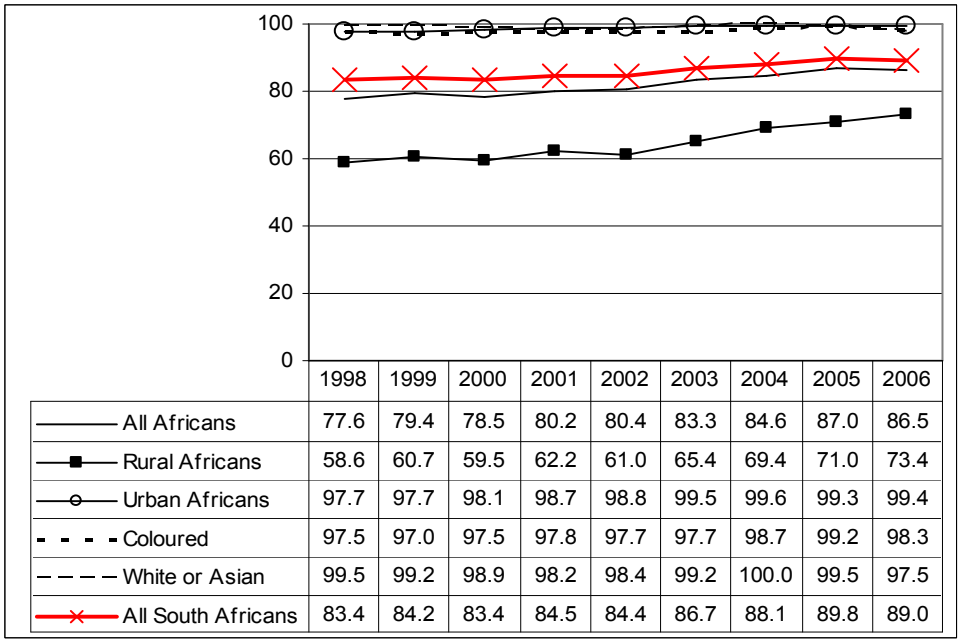
With 78% of South African households headed by an African in 2006, it is common to interpret results for all South African households as indicative of the situation for African households. However, if the situation for non-African households is vastly different than that for African households, this generalization does not hold. As shown in Figure 17, in 2006, 39% of all South African households had a tap in dwelling, while this was true for only 25% of all African households. This difference is because the percent with a tap in dwelling was much higher for non-African households – 76% for Coloured households and 94% for White or Asian households.

Figure 18 shows the percent of households that had a tap either in the dwelling or on the site. The percent with a tap on site or in the dwelling has increased over time for every group except for White or Asian households, almost all of which had a tap in the dwelling or on the site at every date.



	1998	1999	2000	2001	2002	2003	2004	2005
All Africans	51.6	55.3	56.1	57.4	59.1	60.0	58.9	60.0
Rural Africans	25.7	27.3	29.7	29.9	30.5	30.8	30.7	28.4
Urban Africans	79.0	82.8	83.3	85.4	86.4	86.6	86.8	84.2
Coloured	93.4	91.9	91.2	90.6	91.9	92.5	93.4	95.7
White or Asian	99.5	99.0	98.7	98.1	98.3	99.1	98.9	97.4
All South Africans	64.1	65.9	66.0	66.6	67.5	68.3	67.9	68.4

Figure 18. Percent of households with water tap in dwelling or on site

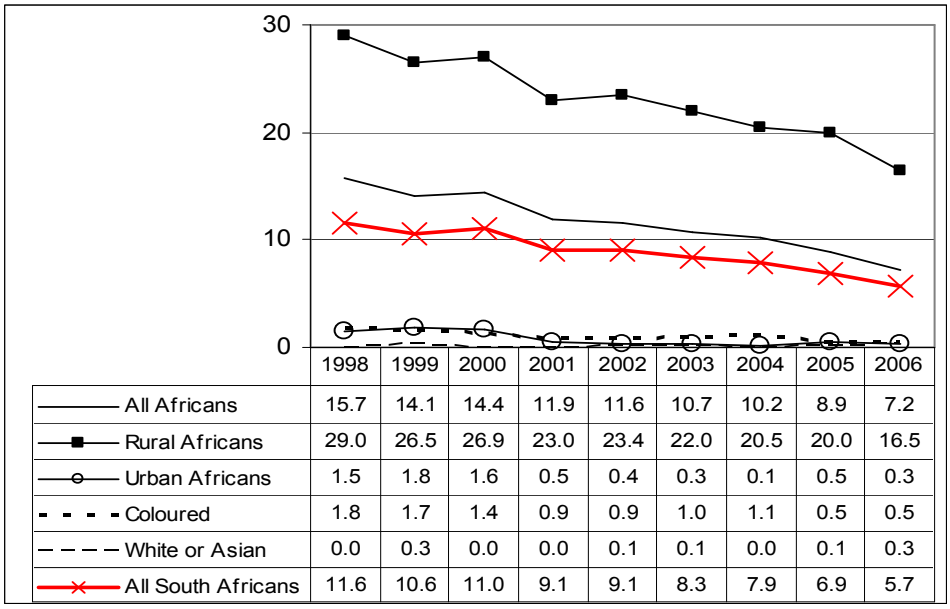


	1998	1999	2000	2001	2002	2003	2004	2005	2006
All Africans	77.6	79.4	78.5	80.2	80.4	83.3	84.6	87.0	86.5
Rural Africans	58.6	60.7	59.5	62.2	61.0	65.4	69.4	71.0	73.4
Urban Africans	97.7	97.7	98.1	98.7	98.8	99.5	99.6	99.3	99.4
Coloured	97.5	97.0	97.5	97.8	97.7	97.7	98.7	99.2	98.3
White or Asian	99.5	99.2	98.9	98.2	98.4	99.2	100.0	99.5	97.5
All South Africans	83.4	84.2	83.4	84.5	84.4	86.7	88.1	89.8	89.0

Figure 19. Percent of households with clean drinking water

Figure 19 shows the percent across time with clean drinking water by group. The percent of all South African households with clean drinking water increased from 83% in 1998 to 89% in 2006. The percent of rural African households with clean water increased from 59% in 1998 to 73% in 2006, an annual rate of increase of 2.8%. However, in 2006, more than 26% of rural African households still did not have clean drinking water. If the rate of increase in the percent of rural households obtaining clean drinking water that held in 1998-2006 persisted, then all rural African households would

have clean drinking water in 2017. Almost all White or Asian households, Coloured households, and urban African households had clean drinking water at all dates.



	1998	1999	2000	2001	2002	2003	2004	2005	2006
All Africans	15.7	14.1	14.4	11.9	11.6	10.7	10.2	8.9	7.2
Rural Africans	29.0	26.5	26.9	23.0	23.4	22.0	20.5	20.0	16.5
Urban Africans	1.5	1.8	1.6	0.5	0.4	0.3	0.1	0.5	0.3
Coloured	1.8	1.7	1.4	0.9	0.9	1.0	1.1	0.5	0.5
White or Asian	0.0	0.3	0.0	0.0	0.1	0.1	0.0	0.1	0.3
All South Africans	11.6	10.6	11.0	9.1	9.1	8.3	7.9	6.9	5.7

Figure 20. Percent of households with drinking water from stream dam or other source (worst drinking water category)

Figure 20 shows over time the percent of households in the worst water situation, those whose drinking water source is a stream, dam or other source. The scale has been changed from 0-100% in Figures 18 and 19 to 0-30% in Figure 20 in order to make the changes over time in Figure 20 clearer. Less than 2% of urban African, Coloured, and White or Asian households used the worst category of drinking water in any year 1998-2006, while in every year the percent of rural African households with the worst source of drinking water exceeded 16%. However, the decrease by more than 40% in the percent of rural African households with the worst drinking water source is impressive.

The percent of households with clean water was close to 100% for urban African, Coloured and White or Asian households in every year since 1998, and by 2006 over 70% of rural African households had clean drinking water. In terms of the conditions of life of rural Africans, the increase in the percent with clean drinking water and the decrease in the percent with the worst source of drinking water is notable. However, in terms of a desirable standard of living, all households would aspire to having a tap in the dwelling. No substantial progress was made in the percent of households with a tap in dwelling between 1998 and 2006 for any group considered.

Type of Sanitation

Good sanitation is important for health and plays an especially important role in infant and child health and survival (Anderson *et al.*, 2002; Esrey *et al.*, 1991; Habicht, DaVanzo, and Butz, 1988; Lee, Rosenzweig, and Pitt, 1997). Contamination of drinking water due to poor disposal of human waste is a major cause of the spread of water-borne infectious diseases (Carr, 2001). The importance of adequate sanitation and the

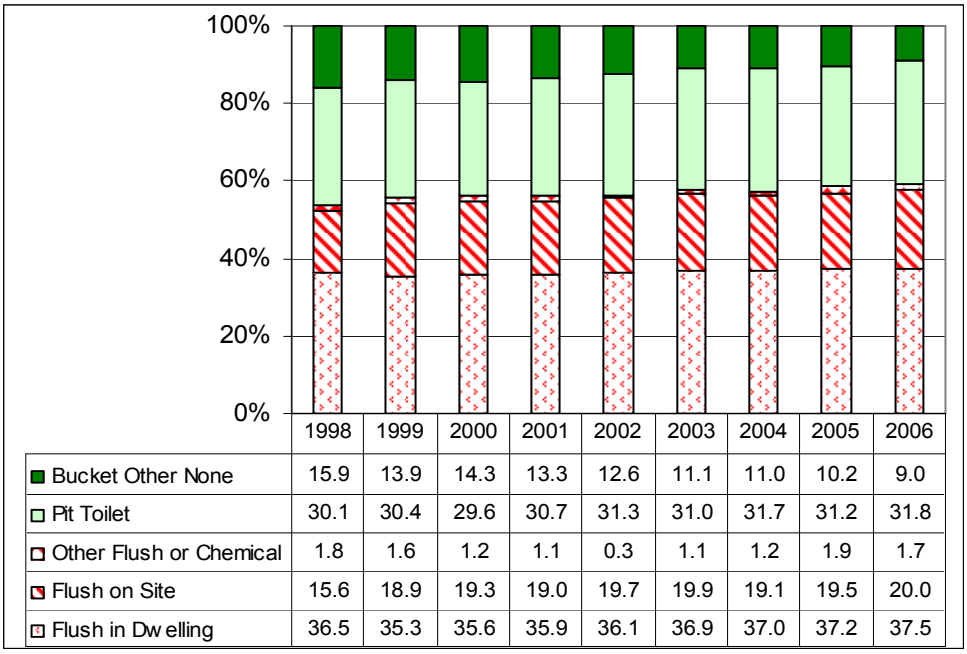
risks when sanitation is not adequate were made clear from the 2001 cholera outbreak in KwaZulu-Natal (DWAF, 2001).

In addition to access to clean drinking water, another part of assuring that all South Africans live in a healthy environment is provision of adequate sanitation. Improving sanitation has also long been a South African governmental goal (DWAF, 1994: 6, 9).

Table 7 shows the classification of sanitation used in this paper according to the categories of sanitation available in the surveys used. Having access to a flush or chemical toilet is a good sanitation situation in terms of health effects and keeping water free of contamination by human waste. However, all households would aspire to having a flush toilet in their dwelling. Bucket toilets remain in use in urban African households. However the South African government has long considered bucket toilets unacceptable, and there have been efforts to eliminate their use (DWAF, 1994: 15). There remain many rural African households with no sanitation facilities.

Table 7. Classification of type of sanitation according to the categories in the surveys used

Flush in Dwelling	Flush toilet in dwelling, whether to sewer system or to septic tank
Flush on Site	Flush toilet on site, whether to sewer system or to septic tank
Other Flush or Chemical	Flush toilet off site, chemical toilet, whether in dwelling, on site or off site
Pit Toilet	Pit latrine whether on site or off site, whether VIP or not
Bucket Other None	Bucket latrine whether on or off site, none



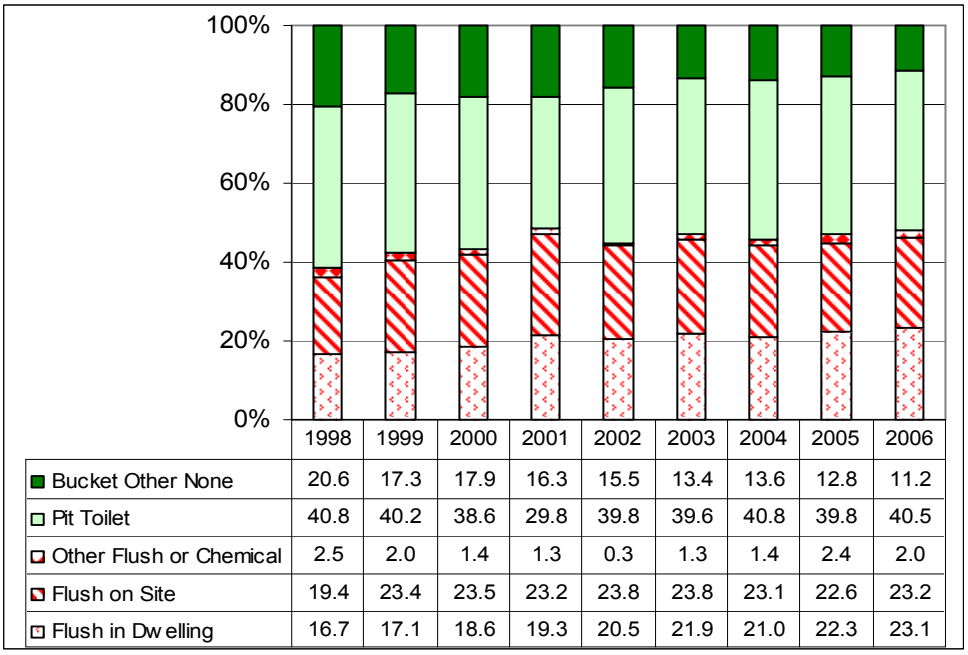
	1998	1999	2000	2001	2002	2003	2004	2005	2006
Bucket Other None	15.9	13.9	14.3	13.3	12.6	11.1	11.0	10.2	9.0
Pit Toilet	30.1	30.4	29.6	30.7	31.3	31.0	31.7	31.2	31.8
Other Flush or Chemical	1.8	1.6	1.2	1.1	0.3	1.1	1.2	1.9	1.7
Flush on Site	15.6	18.9	19.3	19.0	19.7	19.9	19.1	19.5	20.0
Flush in Dwelling	36.5	35.3	35.6	35.9	36.1	36.9	37.0	37.2	37.5

Figure 21. Type of sanitation for all South African households

Figure 21 shows the percent distribution of type of sanitation for all South Africans over time. In the figures the three categories of the household using a flush or

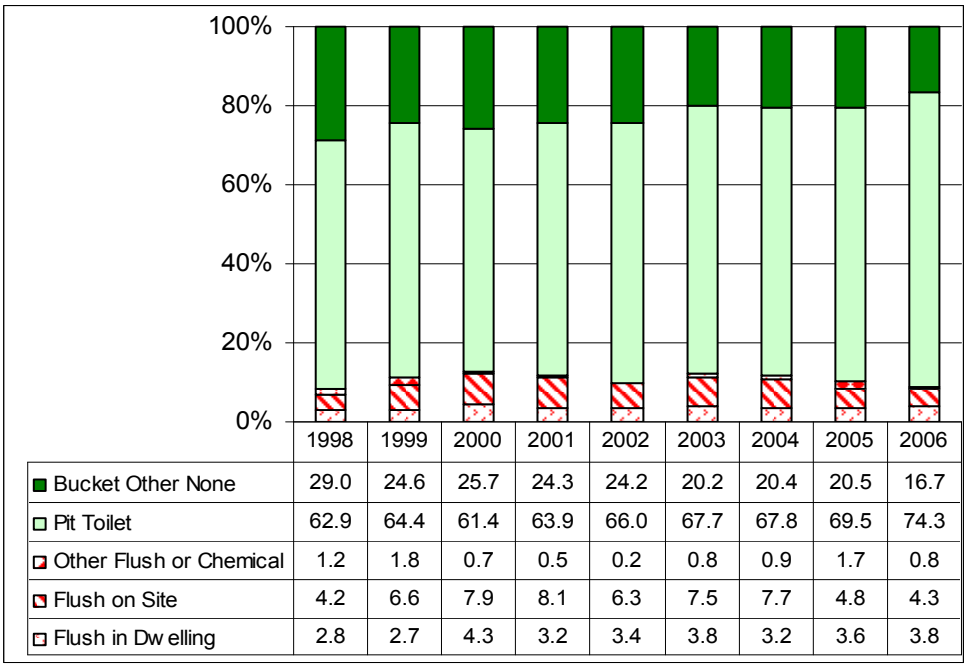
chemical toilet are indicated by red patterns, and the two other sanitation categories, pit toilet and bucket other none, are indicated by light and by dark solid green.

As shown in Figure 21, there is a decline of 43% between 1998 and 2006 in the percent of households using the worst type of sanitation, bucket other none, an annual rate of decline of 6%. There are no other clear trends in the sanitation data for all South African households.



	1998	1999	2000	2001	2002	2003	2004	2005	2006
Bucket Other None	20.6	17.3	17.9	16.3	15.5	13.4	13.6	12.8	11.2
Pit Toilet	40.8	40.2	38.6	29.8	39.8	39.6	40.8	39.8	40.5
Other Flush or Chemical	2.5	2.0	1.4	1.3	0.3	1.3	1.4	2.4	2.0
Flush on Site	19.4	23.4	23.5	23.2	23.8	23.8	23.1	22.6	23.2
Flush in Dwelling	16.7	17.1	18.6	19.3	20.5	21.9	21.0	22.3	23.1

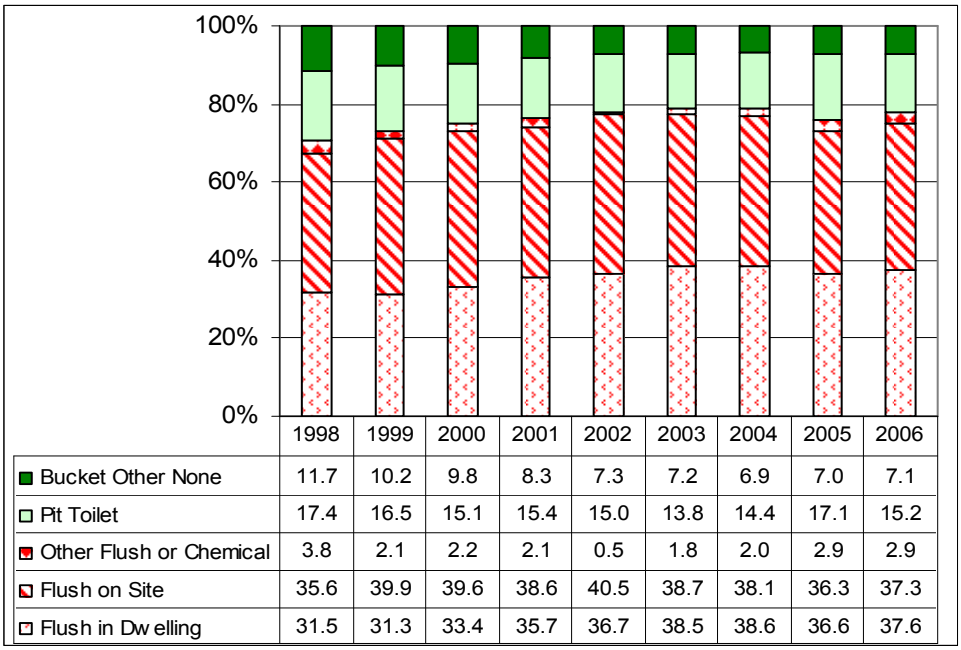
Figure 22. Type of sanitation for African households



	1998	1999	2000	2001	2002	2003	2004	2005	2006
Bucket Other None	29.0	24.6	25.7	24.3	24.2	20.2	20.4	20.5	16.7
Pit Toilet	62.9	64.4	61.4	63.9	66.0	67.7	67.8	69.5	74.3
Other Flush or Chemical	1.2	1.8	0.7	0.5	0.2	0.8	0.9	1.7	0.8
Flush on Site	4.2	6.6	7.9	8.1	6.3	7.5	7.7	4.8	4.3
Flush in Dwelling	2.8	2.7	4.3	3.2	3.4	3.8	3.2	3.6	3.8

Figure 23. Type of sanitation for rural African households

Figure 22 shows the sanitation situation for all African households, Figure 23 for rural African households, and Figure 24 for urban African households. Almost no rural African households had a flush toilet in the dwelling. Between 1998 and 2006, there was an increase of 19% in the percent of urban African households with a flush toilet in the dwelling. Urban African households were about as likely to have a flush toilet on site (in the yard) as in the dwelling.



	1998	1999	2000	2001	2002	2003	2004	2005	2006
Bucket Other None	11.7	10.2	9.8	8.3	7.3	7.2	6.9	7.0	7.1
Pit Toilet	17.4	16.5	15.1	15.4	15.0	13.8	14.4	17.1	15.2
Other Flush or Chemical	3.8	2.1	2.2	2.1	0.5	1.8	2.0	2.9	2.9
Flush on Site	35.6	39.9	39.6	38.6	40.5	38.7	38.1	36.3	37.3
Flush in Dw elling	31.5	31.3	33.4	35.7	36.7	38.5	38.6	36.6	37.6

Figure 24. Type of sanitation for urban African households

By 2006, the percent of rural African households in the category "Bucket Other None" was 58% of the 1998 value and the percent of urban African households in the category "Bucket Other None" 61% of the 1998 value. Thus, many African households had moved out of the worst sanitation category between 1998 and 2006.

The nature of the movement out of the "Bucket Other None" sanitation category differed between rural Africans and urban Africans. Figure 25 shows for 1998 and Figure 26 shows for 2006 the composition of this category over time for rural African households, urban African households, and all South African households. [7]

We see in Figures 25 and 26, that almost no rural African households used a bucket toilet. The problem for rural African households was that 28% in 1998 and 16% in 2006 had no sanitation facilities. The decline in the lowest category is mainly accounted for by a shift into the unventilated pit toilet category. Apparently between 1998 and 2006 a substantial number of rural African households dug a pit toilet.

Bucket toilets were a more common type of sanitation for urban African households. The percent of urban African households with a bucket toilet as the main type of sanitation declined from 8% in 1998 to 4% in 2006.

[7] The category "Other" sanitation is not shown in Figures 24 and 25. There were no households recorded in the "Other category in 2006, and in 1998, the "Other" category was recorded for .5%of rural African households, and for .3% of urban African households and of all South African households.

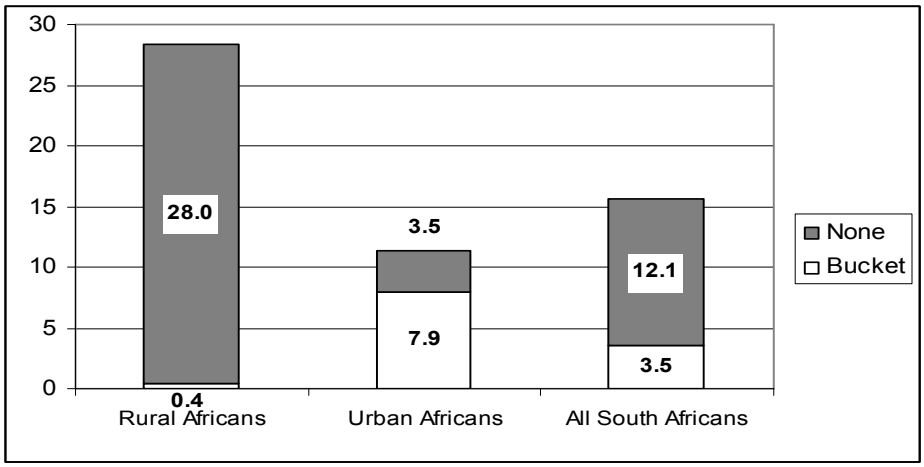


Figure 25. The composition of type of sanitation within the worst sanitation category, 1998

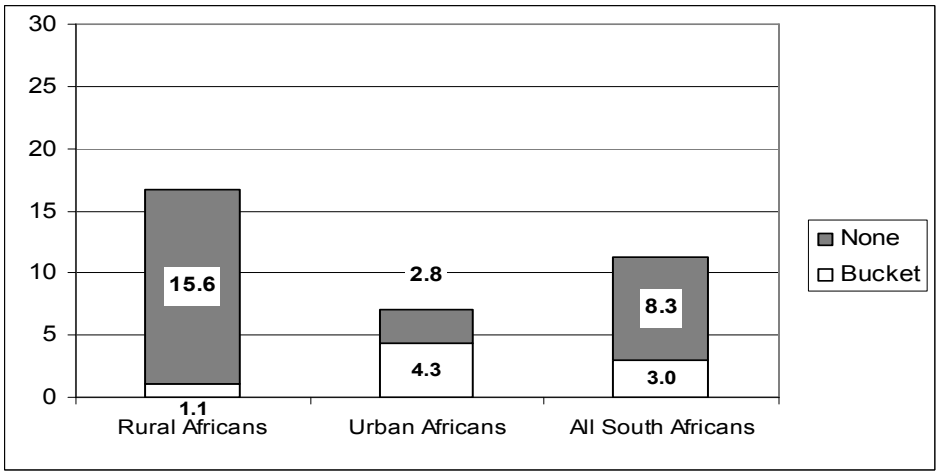


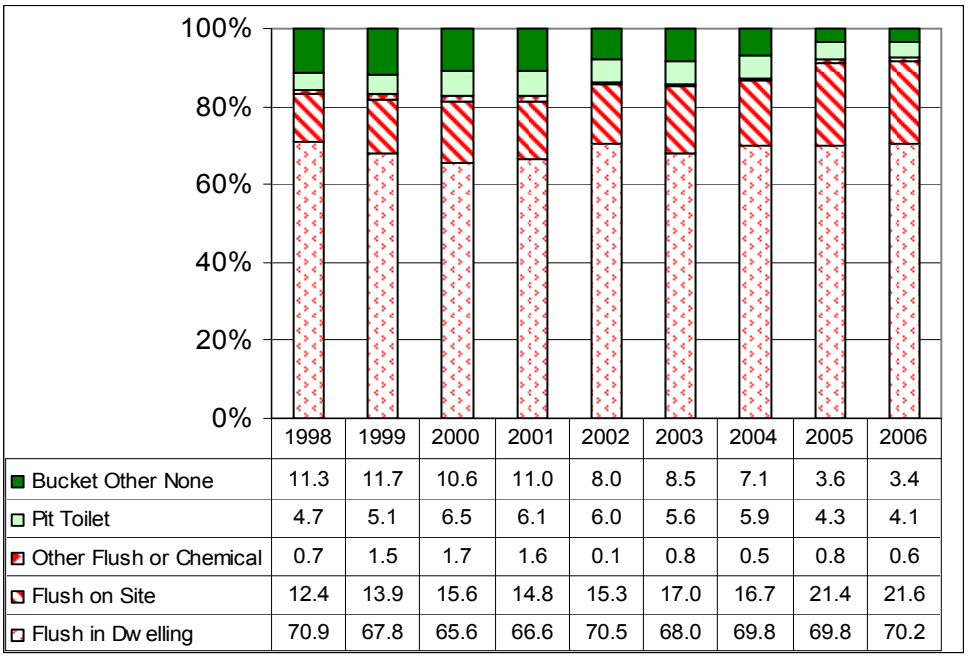
Figure 26. The composition of type of sanitation within the worst sanitation category, 2006

Table 8. Frequency of removal of bucket toilets used as a household's main type of sanitation: 1998 and 2006

	1998	2004
Once a week or more often	89%	79%
About once a fortnight	7%	13%
About once a month	2%	4%
Less often than once a month	2%	4%
Total	100%	100%

The decline in the percent of households that use bucket toilets is a very good thing. However, there are also questions about the characteristics of the bucket toilets that continue to be used. An important aspect of a bucket toilet is how frequently the waste is removed. Table 8 shows that there was no improvement in the frequency with which the waste was removed between 1998 and 2006 among households in which a bucket toilet was the main type of sanitation.

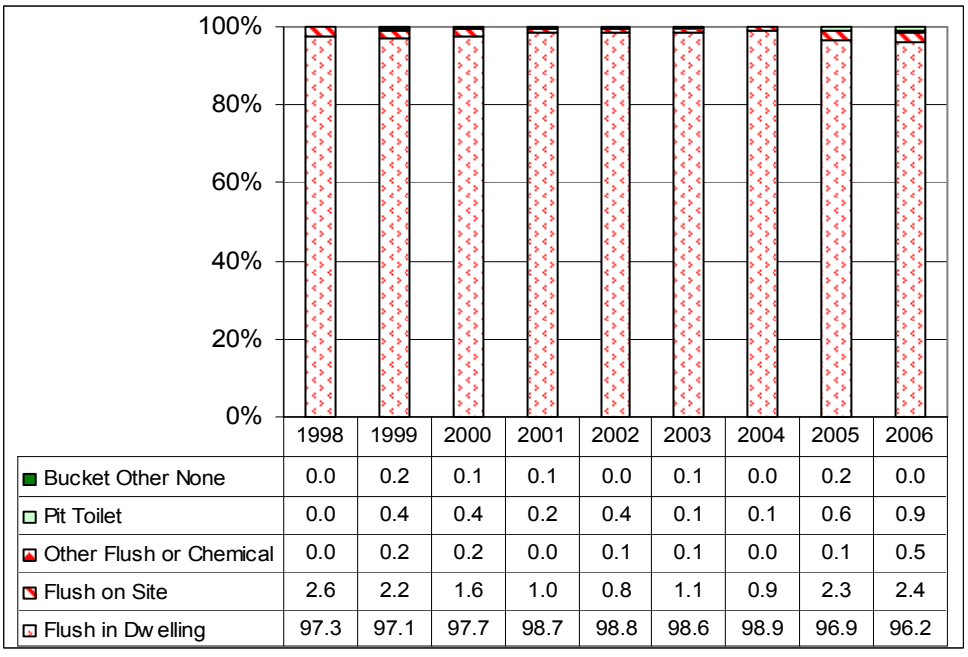
In 2003, a target was set to eliminate all bucket toilets by 2006 (DWAF, 2003: 6). Although there has been substantial reduction in bucket toilets, they had not been eliminated by 2006.



	1998	1999	2000	2001	2002	2003	2004	2005	2006
Bucket Other None	11.3	11.7	10.6	11.0	8.0	8.5	7.1	3.6	3.4
Pit Toilet	4.7	5.1	6.5	6.1	6.0	5.6	5.9	4.3	4.1
Other Flush or Chemical	0.7	1.5	1.7	1.6	0.1	0.8	0.5	0.8	0.6
Flush on Site	12.4	13.9	15.6	14.8	15.3	17.0	16.7	21.4	21.6
Flush in Dwelling	70.9	67.8	65.6	66.6	70.5	68.0	69.8	69.8	70.2

Figure 27. Type of sanitation for Coloured households

Figure 27 shows the sanitation situation for Coloured households. As for urban African households, there was a large decline in the percent of Coloured households in the worst category of sanitation; the percent in 2006 was 30% of the value in 1998. The overall sanitation situation for Coloured households was much better than that of urban African households; in 2006 70% of Coloured households had a flush toilet in the dwelling, while this was true for only 38% of urban African households.

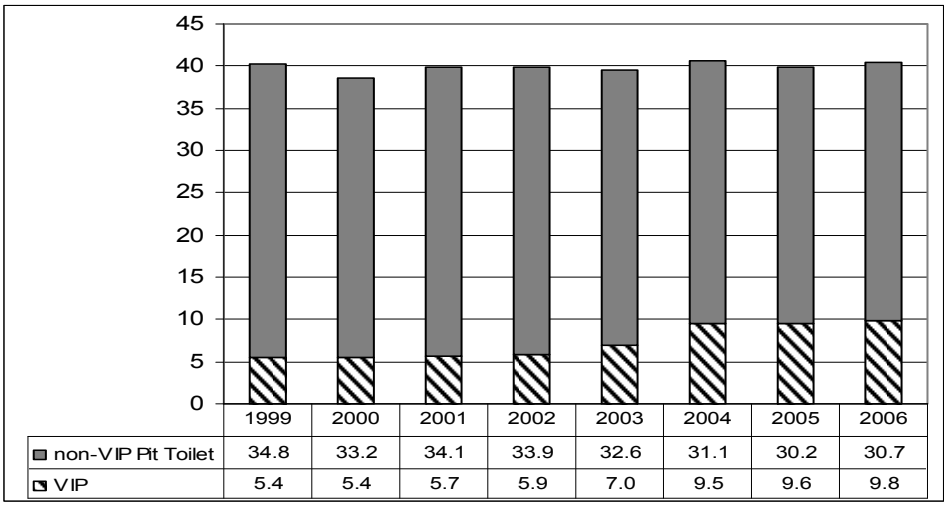


	1998	1999	2000	2001	2002	2003	2004	2005	2006
Bucket Other None	0.0	0.2	0.1	0.1	0.0	0.1	0.0	0.2	0.0
Pit Toilet	0.0	0.4	0.4	0.2	0.4	0.1	0.1	0.6	0.9
Other Flush or Chemical	0.0	0.2	0.2	0.0	0.1	0.1	0.0	0.1	0.5
Flush on Site	2.6	2.2	1.6	1.0	0.8	1.1	0.9	2.3	2.4
Flush in Dwelling	97.3	97.1	97.7	98.7	98.8	98.6	98.9	96.9	96.2

Figure 28. Type of sanitation for White or Asian households

Figure 28 shows the sanitation situation for White or Asian households. Over 96% of White or Asian households had a flush toilet in the dwelling at every date.

There has been South African governmental interest in extending the number of VIP's (ventilated improved pit toilets). VIP's are substantially better than ordinary pit toilets, having a lower odor level and providing greater protection from insects. They have been characterized by DWAF as an "appropriate and adequate basic level of sanitation service" (DWAF, 1994: 15). This effort to expand the use of VIP's has mainly been an effort to improve the sanitation situation of African households, since it is clear from Figures 27 and 28 that only a mall percent of non-African households used a pit toilet.



	1999	2000	2001	2002	2003	2004	2005	2006
non-VIP Pit Toilet	34.8	33.2	34.1	33.9	32.6	31.1	30.2	30.7
VIP	5.4	5.4	5.7	5.9	7.0	9.5	9.6	9.8

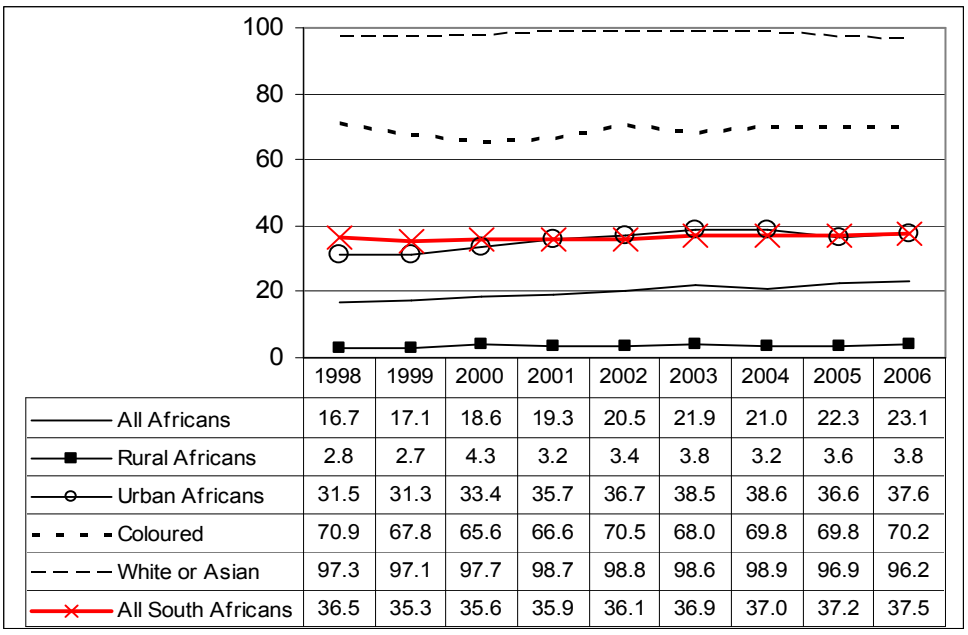
Figure 29. The percent of all African households with a pit toilet, according to whether it is a Ventilated Improved Pit Toilet (VIP) or a non-VIP pit toilet

Figure 29 shows for African households the percent with pit toilets 1999-2005. As seen in Figure 29, the percent with pit toilets changed little, from 40.2% in 1999 to 40.5% in 2006. However, the effort to increase VIP's had met with some success. The percent of African households with VIP's almost doubled between 1999 and 2006, from 5.4% to 9.8%. The percent of all pit toilets used by African households that were VIP's increased from 13% in 1999 to 24% in 2006.[8]

Figure 30 shows the percent of households with a flush toilet in the dwelling across each of the groups considered. The large differences among groups in whether households have a flush toilet in the dwelling are quite clear. As in Figure 17, which examined the presence of a water tap in dwelling, the percent with a flush toilet in the dwelling for all South African households is substantially higher than for all African households at every date (38% versus 23% for 2006). This is because the percent of White or Asian households and of Coloured households with a flush toilet in the dwelling are much higher than for African households.

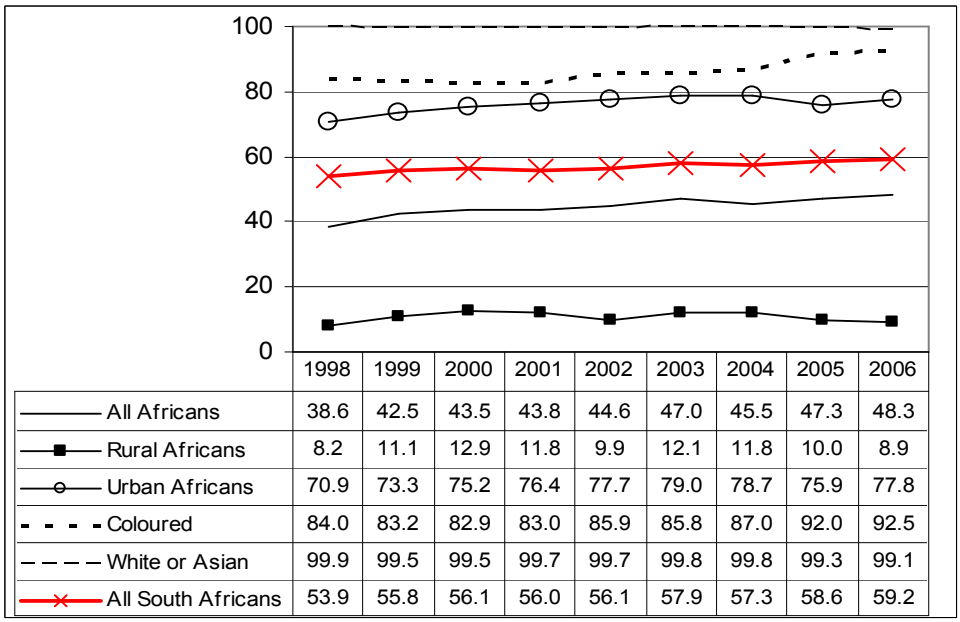
[8] Figure 29 shows data on VIP's beginning in 1999 rather than beginning in 1998. There seems to be a problem with reporting of VIP's in 1998. For 1998, for African households, 40.8% of all households are reported as having a pit toilet (whether a VIP or not), which is consistent with the 1999 results. However, for 1998, 14.5% of African households are reported as having a VIP and 26.3% are reported as having a non-VIP pit toilet. The report of 14.5% of African households having a VIP in 1998 seems impossible; this figure is more than 50% higher than the percent of African households with a VIP in 2006.

Between 1998 and 2006, there was virtually no change in the percent of all South African households with a flush toilet in the dwelling. There was some increase for urban African households, from 32% in 1998 to 38% in 2006. For all African households there was an increase from 17% in 1998 to 23% in 2006. There was a small change for rural African households and no change for Coloured households. Almost all White or Asian households had a flush toilet in the dwelling at all dates.



	1998	1999	2000	2001	2002	2003	2004	2005	2006
All Africans	16.7	17.1	18.6	19.3	20.5	21.9	21.0	22.3	23.1
Rural Africans	2.8	2.7	4.3	3.2	3.4	3.8	3.2	3.6	3.8
Urban Africans	31.5	31.3	33.4	35.7	36.7	38.5	38.6	36.6	37.6
Coloured	70.9	67.8	65.6	66.6	70.5	68.0	69.8	69.8	70.2
White or Asian	97.3	97.1	97.7	98.7	98.8	98.6	98.9	96.9	96.2
All South Africans	36.5	35.3	35.6	35.9	36.1	36.9	37.0	37.2	37.5

Figure 30. Percent of households with flush toilet in dwelling

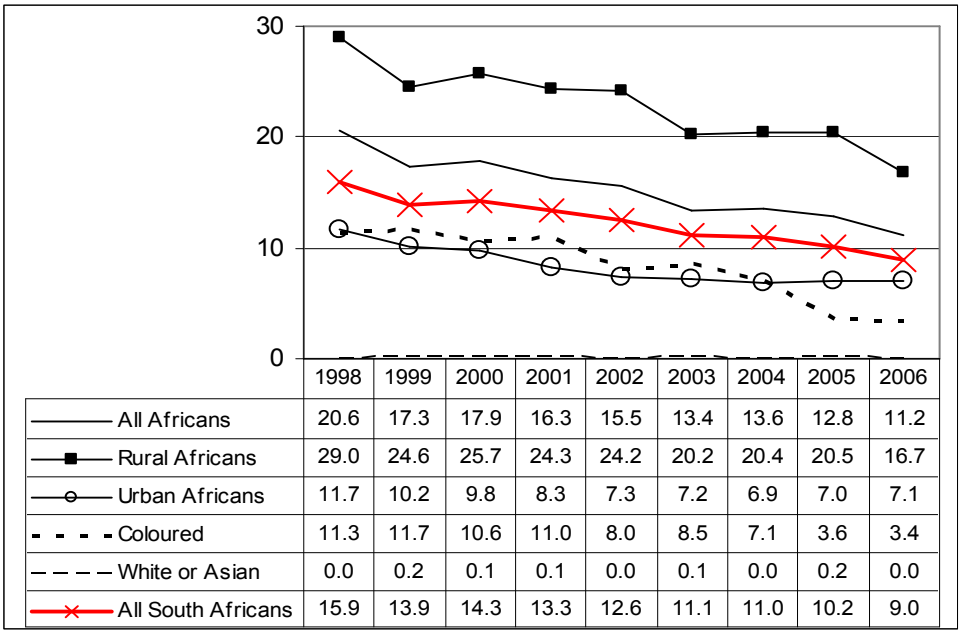


	1998	1999	2000	2001	2002	2003	2004	2005	2006
All Africans	38.6	42.5	43.5	43.8	44.6	47.0	45.5	47.3	48.3
Rural Africans	8.2	11.1	12.9	11.8	9.9	12.1	11.8	10.0	8.9
Urban Africans	70.9	73.3	75.2	76.4	77.7	79.0	78.7	75.9	77.8
Coloured	84.0	83.2	82.9	83.0	85.9	85.8	87.0	92.0	92.5
White or Asian	99.9	99.5	99.5	99.7	99.7	99.8	99.8	99.3	99.1
All South Africans	53.9	55.8	56.1	56.0	56.1	57.9	57.3	58.6	59.2

Figure 31. Percent of households using a flush toilet or a chemical toilet

Figure 31 shows the percent of households which use a flush or chemical toilet, regardless of its location. This percent has increased between 1998 and 2006 for urban African households (71% to 78%). Thus it has also increased between 1998 and 2004 for all African households (39% to 48%).

Having a flush or chemical toilet, regardless of the location, likely provides a situation in which the water supply is not contaminated by human waste and the household benefits from the resulting health effects. However, all households aspire to having a flush toilet in their dwelling. Both for improvement in the sanitation situation (a flush or chemical toilet) and for having a desirable sanitation situation (flush toilet in dwelling), urban African households (and thus African households as a whole) are the only group that improved in either area between 1998 and 2006. Overall, there was very little change in the sanitation situation of any group between 1998 and 2006, with the exception of replacement of some non-VIP pit toilets by VIP's.



	1998	1999	2000	2001	2002	2003	2004	2005	2006
All Africans	20.6	17.3	17.9	16.3	15.5	13.4	13.6	12.8	11.2
Rural Africans	29.0	24.6	25.7	24.3	24.2	20.2	20.4	20.5	16.7
Urban Africans	11.7	10.2	9.8	8.3	7.3	7.2	6.9	7.0	7.1
Coloured	11.3	11.7	10.6	11.0	8.0	8.5	7.1	3.6	3.4
White or Asian	0.0	0.2	0.1	0.1	0.0	0.1	0.0	0.2	0.0
All South Africans	15.9	13.9	14.3	13.3	12.6	11.1	11.0	10.2	9.0

Figure 32. Percent of households with a bucket other or none (worst type of sanitation)

Figure 32 looks at the percent of households using the worst type of sanitation, bucket, stream or other. The scale has been changed from 0-100% to 0-30% in order to make the changes over time in Figure 32 clearer.

The worst type of drinking water, shown in Figure 20, affected a substantial percent of households only among rural Africans. The percent of urban African household with the worst source of drinking water went from 2% in 1998 to less than 1% in 2006. In 1998, over 11% of urban African households used the worst type of sanitation, and in 2006, 7% of urban Africans still used the worst type of sanitation Thus improvement of sanitation presented a more widespread problem in 1998 than did improvement of the source of drinking water, and sanitation remained a more severe problem than source of drinking water in 2006.

Groups by Standard of Living

We divide households into four groups by standard of living. These four groups are described in Table 9.

A basic division of households by standard of living is into: (1) those that have clean drinking water and decent sanitation and (2) those that do not. A household has clean drinking water if the household's main source of drinking water is would be a water tap (whether in the dwelling, on site or not on site, such as a public tap or a water tanker) – one of the top three categories of source of drinking water. Decent sanitation would be if the household used a flush or chemical toilet (whether in the dwelling, on site or not on site) – one of the top three categories of sanitation.

Table 9. Definition of four standard of living (SOL) groups

Basic Requirements	SOL Group	Additional Requirements
Clean drinking water and use of a flush or chemical toilet	Middle	Lives in formal housing Water tap in dwelling Flush toilet in dwelling Electricity is main light source Electricity or gas is main cooking source Has a landline phone or a household member has a cellphone
	Middle Low-DecentSES	Does not fit all of the requirements of the middle group, for example might have the water tap on site, such as in the yard, or might have a chemical toilet
Not both clean drinking water and use of a flush or chemical toilet	Low Middle Low	Does not fit all the requirements of the low group, for example might have a pit latrine, or might have a rainwater tank for drinking water
	Low	Does not live in formal housing Drinking water source is a stream, dam or other source Uses a bucket toilet, other or none Main cooking source is not electricity or gas

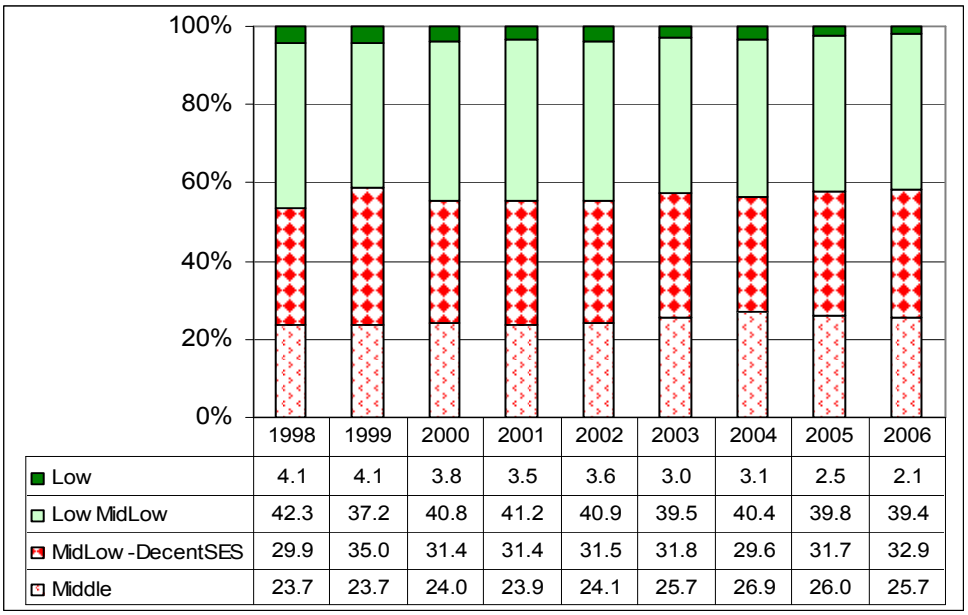
The top two groups described in Table 9 have both clean drinking water and decent sanitation, according to our definition. The bottom two groups do not have both clean drinking water and decent sanitation.

The top group, which we identify as middle class or at least having the potential to be middle class, shares with the second group clean drinking water and decent sanitation, but households in this top group also have several other characteristics that are necessary for a household to be considered middle class. Households in the top group reside in formal housing. Also, they have a water tap and a flush toilet in the dwelling. In addition, electricity is the main source of lighting and electricity or gas is the main source of cooking. There is a landline phone in the dwelling or a household member has a cell phone.

The bottom group shares with the third group the fact that it does not have both clean drinking water and decent sanitation. In fact the bottom group has very poor water and very poor sanitation. For households in the bottom group the main source of drinking water is a stream, dam, or other source – the bottom category of source of

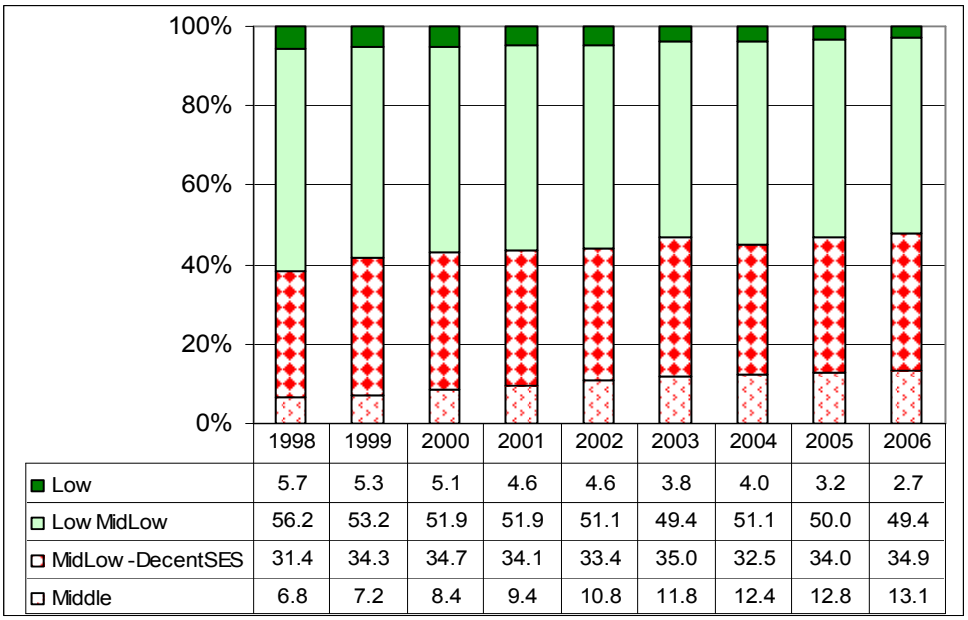
drinking water. In addition, the household's source of sanitation is a bucket toilet or no toilet – the bottom category of type of sanitation. Also, for households in the bottom group, the main source of cooking fuel is neither electricity nor gas.

Figure 33 shows the division of all South African households into the four standard of living groups over time. The middle class group has increased slightly – from 24% to 26%. The lowest group has declined – from 4% to 2%. The two middle groups have changed very little, with somewhat more households in the second from the bottom category than in the second from the top category.



	1998	1999	2000	2001	2002	2003	2004	2005	2006
Low	4.1	4.1	3.8	3.5	3.6	3.0	3.1	2.5	2.1
Low MidLow	42.3	37.2	40.8	41.2	40.9	39.5	40.4	39.8	39.4
MidLow -DecentSES	29.9	35.0	31.4	31.4	31.5	31.8	29.6	31.7	32.9
Middle	23.7	23.7	24.0	23.9	24.1	25.7	26.9	26.0	25.7

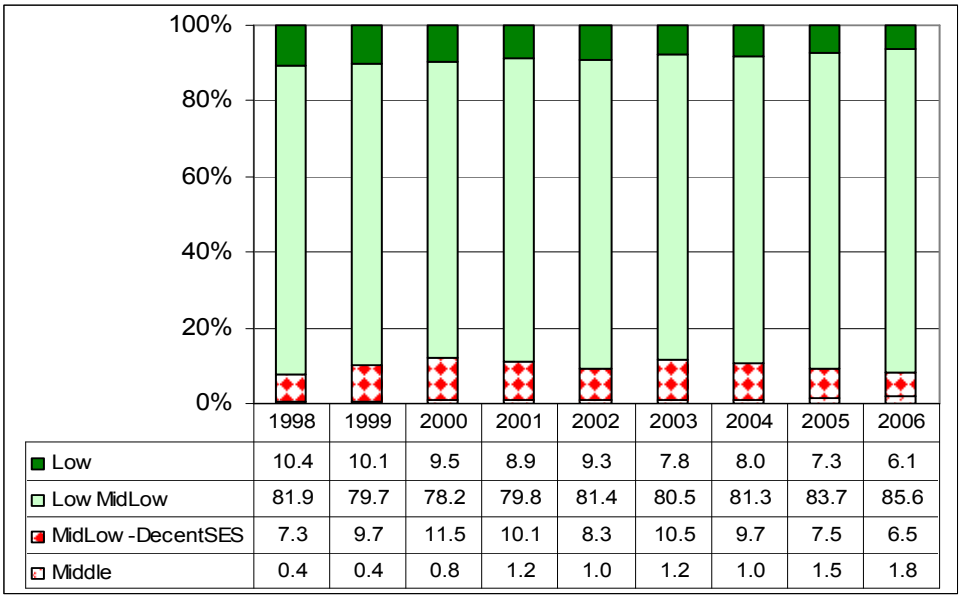
Figure 33. Distribution among SOL groups for all South African households



	1998	1999	2000	2001	2002	2003	2004	2005	2006
Low	5.7	5.3	5.1	4.6	4.6	3.8	4.0	3.2	2.7
Low MidLow	56.2	53.2	51.9	51.9	51.1	49.4	51.1	50.0	49.4
MidLow -DecentSES	31.4	34.3	34.7	34.1	33.4	35.0	32.5	34.0	34.9
Middle	6.8	7.2	8.4	9.4	10.8	11.8	12.4	12.8	13.1

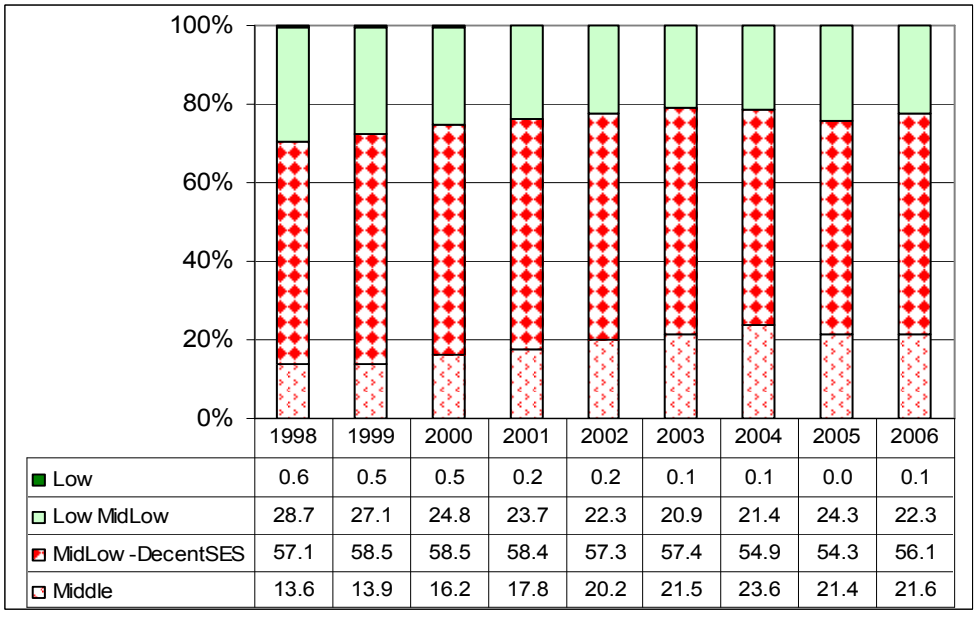
Figure 34. Distribution among SOL groups for African households

Figure 34 shows the distribution among the four standard of living categories for all African households, Figure 35 for rural African households, and Figure 36 for urban African households. For all Africans, the percent of households which are middle class has almost doubled over time – an increase of 93%. The percent in the lowest category declined by 2006 to 47% of the 1998 value.



	1998	1999	2000	2001	2002	2003	2004	2005	2006
Low	10.4	10.1	9.5	8.9	9.3	7.8	8.0	7.3	6.1
Low MidLow	81.9	79.7	78.2	79.8	81.4	80.5	81.3	83.7	85.6
MidLow -DecentSES	7.3	9.7	11.5	10.1	8.3	10.5	9.7	7.5	6.5
Middle	0.4	0.4	0.8	1.2	1.0	1.2	1.0	1.5	1.8

Figure 35. Distribution among SOL groups for rural African households



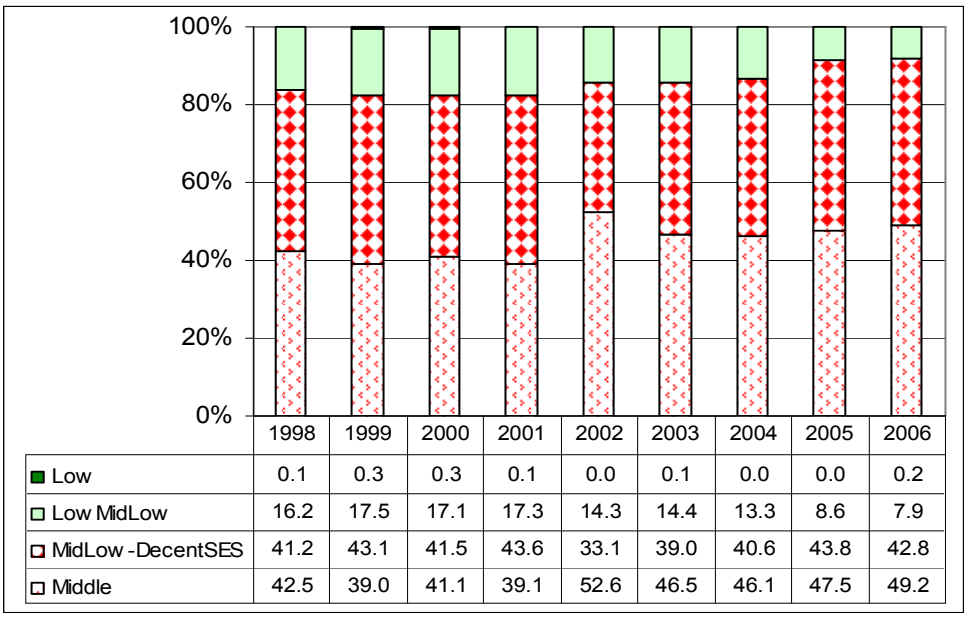
	1998	1999	2000	2001	2002	2003	2004	2005	2006
Low	0.6	0.5	0.5	0.2	0.2	0.1	0.1	0.0	0.1
Low MidLow	28.7	27.1	24.8	23.7	22.3	20.9	21.4	24.3	22.3
MidLow -DecentSES	57.1	58.5	58.5	58.4	57.3	57.4	54.9	54.3	56.1
Middle	13.6	13.9	16.2	17.8	20.2	21.5	23.6	21.4	21.6

Figure 36. Distribution among SOL groups for urban African households

The percent of rural African households in the lowest category declined by 41%, from 10% to 6%. About 80% of rural African households were in the second lowest category at every date. These households did not have a terrible standard of living in every area, but they did not have both a clean source of drinking water and a flush or

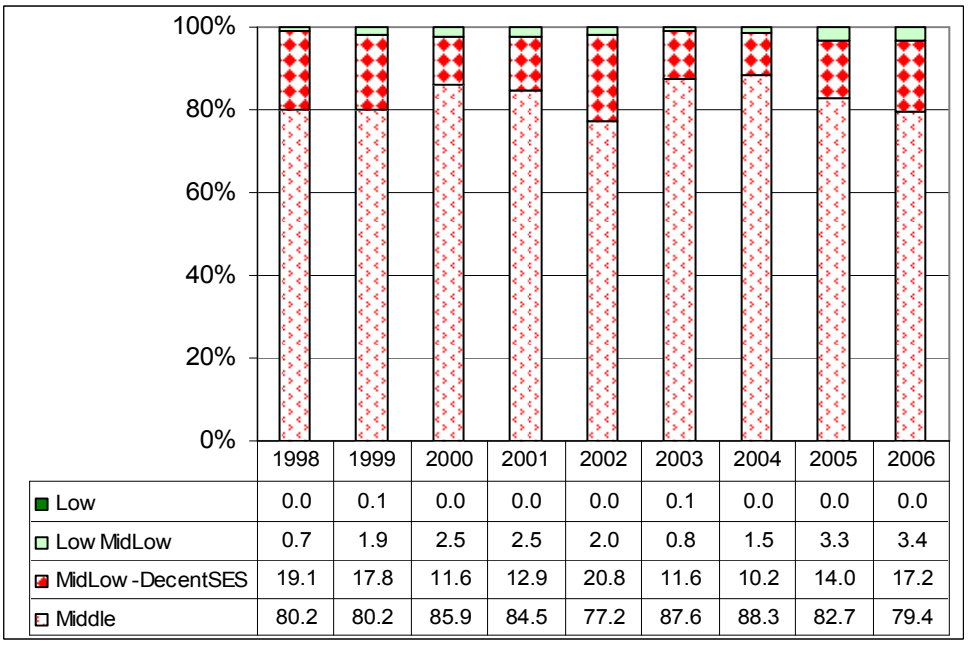
chemical toilet. The percent of rural African households in the middle class more than quadrupled, but only from about 0.5% to about 2%.

The percent of urban African households in the middle class increased by 59%. Also the percent of urban African households with a decent standard of living increased over time. Almost no urban African households (less than 1%) were in the lowest category at any date.



	1998	1999	2000	2001	2002	2003	2004	2005	2006
Low	0.1	0.3	0.3	0.1	0.0	0.1	0.0	0.0	0.2
Low MidLow	16.2	17.5	17.1	17.3	14.3	14.4	13.3	8.6	7.9
MidLow -DecentSES	41.2	43.1	41.5	43.6	33.1	39.0	40.6	43.8	42.8
Middle	42.5	39.0	41.1	39.1	52.6	46.5	46.1	47.5	49.2

Figure 37. Distribution among SOL groups for Coloured households



	1998	1999	2000	2001	2002	2003	2004	2005	2006
Low	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Low MidLow	0.7	1.9	2.5	2.5	2.0	0.8	1.5	3.3	3.4
MidLow -DecentSES	19.1	17.8	11.6	12.9	20.8	11.6	10.2	14.0	17.2
Middle	80.2	80.2	85.9	84.5	77.2	87.6	88.3	82.7	79.4

Figure 38. Distribution among SOL groups for White or Asian households

Figure 37 shows the standard of living distribution for Coloured households. Coloured households were about twice as likely to be middle class as urban African

households at every date. The percent of Coloured households in the second from the bottom category declined over time. Almost no Coloured households were in the lowest category at any date. The increase in the estimated percent of Coloured households in the middle class for 2002 (53% in 2002, compared with 39% in 2001 and 47% in 2003) is likely due to a misclassification of some households with a flush toilet on site as having a flush toilet in the dwelling.

Figure 38 shows the standard of living distribution of White or Asian households. There is no discernible trend for White or Asian households, but at every date at least 77% of these households were in the middle class.

In Figures 34-38 we looked at the percent distribution of population groupings among the four SOL categories 1998-2006. Another relevant question is: What is the percent distribution of population groupings among the four SOL categories, and how has this changed over time?

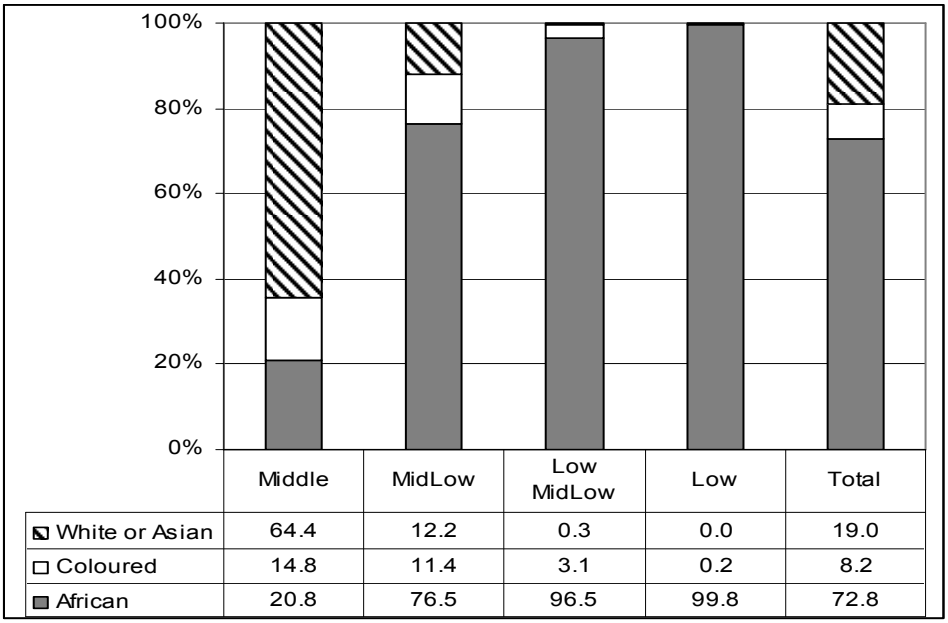
Figures 39 and 40 answer this question. They show the percent distribution of population groupings within each of the four SOL categories for 1998 and 2006. The two lowest categories are occupied almost totally by African households at both dates. Note that Figures 39 and 40 show the population grouping percent distribution within each SOL group. Although 99.3% of all the households in the lowest group had an African head of household in 2006, recall from Figure 34 that in 2006, only 2.7% of all households in which the head was African were in the lowest SOL group.

The most striking result in Figures 39 and 40 is the increase in the percent of middle class households comprised by African households between 1998 and 2006, an increase from 21% to 40%. Since the percent of White or Asian households which were in the middle class changed trivially between 1998 and 2006 (80% to 79% in Figure 38) and of Coloured households increased between 1998 and 2006 (43% to 49% in Figure 37) this increase in the percent of middle class households which were headed by an African is due to an improvement in the standard of living of African households rather than due to a deterioration in the standard of living of Coloured households or of White or Asian households.

It is also interesting that in 2006 less then 50% of all middle class households had a White or Asian household head. This is consistent with the conclusion by Seekings and Nattrass (2005:306) that between 1995 and 2000 the percent of the top income decile obtained by those who were African or Coloured increased from 22% to 34-40%.

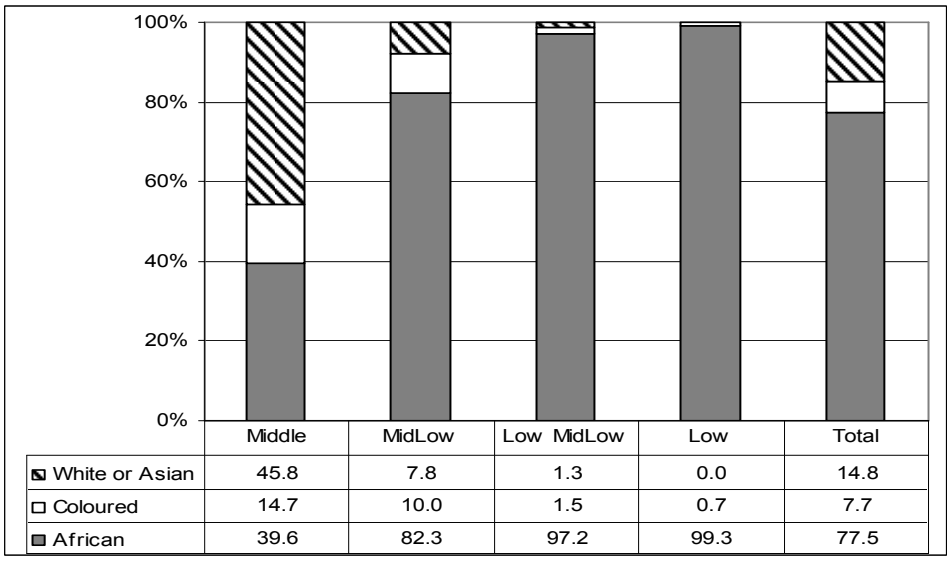
This does not mean that African households were as likely to have a middle class standard of living as non-African households. Given the composition of the South African population among these population groupings, as shown in the last column of Figure 39, in 1998, African households were only .3 times as likely to be in the middle class as their overall population percent would have implied, while Coloured households were 1.8 times and White or Asian households were 3.4 times as likely to be in the middle class as would be implied by their population percent. As shown in Figure 40, by 2006, African households were .51 times as likely (one-half as likely) to be in the middle class as their population percentage would have implied. The values for non-African households in 2006 were almost unchanged from 1998, 1.9 for Coloured households and 3.1 for White or Asian households.

However, this change in the population group composition of middle class households is not meaningless. The increase between 1998 and 2006 in the percent of all middle class households with an African head reflects increasing power in the market of Africans and the motivation for those manufacturing and selling goods aimed at those who do not need to worry about their basic standard of living to increasing direct product development and advertising at the African population.



	Middle	MidLow	Low MidLow	Low	Total
White or Asian	64.4	12.2	0.3	0.0	19.0
Coloured	14.8	11.4	3.1	0.2	8.2
African	20.8	76.5	96.5	99.8	72.8

Figure 39. Percent distribution of households by population grouping within four SOL groups: 1998

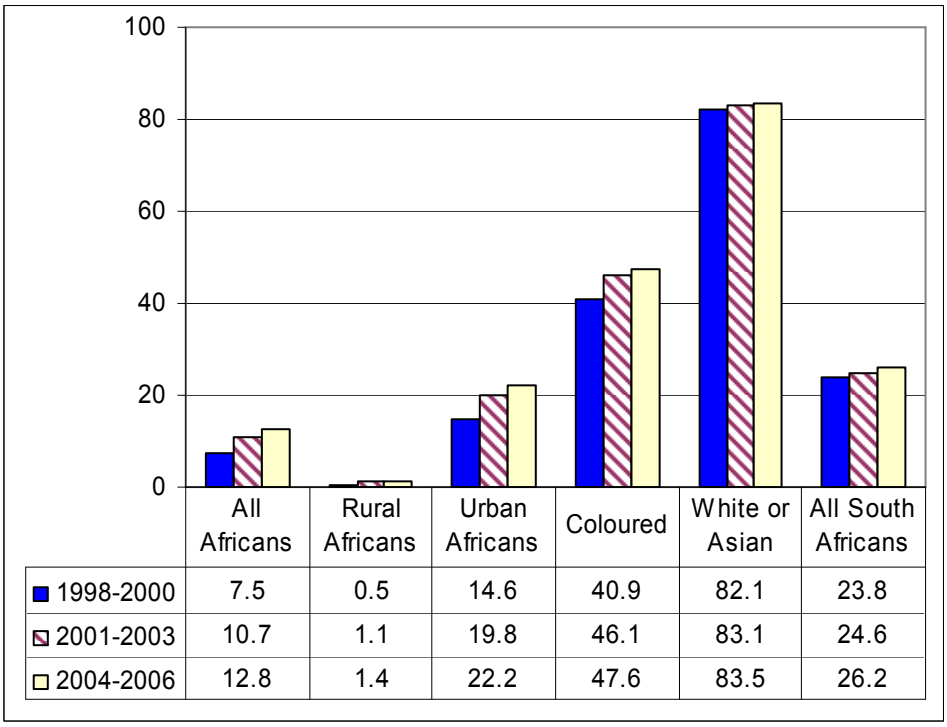


	Middle	MidLow	Low MidLow	Low	Total
White or Asian	45.8	7.8	1.3	0.0	14.8
Coloured	14.7	10.0	1.5	0.7	7.7
African	39.6	82.3	97.2	99.3	77.5

Figure 40. Percent distribution of households by population grouping within four SOL groups: 2006

Figure 41 shows the percent of households in the middle class within each group. To smooth out year to year variations, means for three year periods (1998-2000, 2001-2003, and 2004-2006) are shown. The increase over time for Coloured households and for urban African households is clear. However, there was a small

increase (and no decrease) in the percent in the middle class even for White or Asian households, again indicating that the increase in the share of middle class households comprised by African households (Figures 39 and 40) was not due to any worsening in the situation of White or Asian households.



	All Africans	Rural Africans	Urban Africans	Coloured	White or Asian	All South Africans
1998-2000	7.5	0.5	14.6	40.9	82.1	23.8
2001-2003	10.7	1.1	19.8	46.1	83.1	24.6
2004-2006	12.8	1.4	22.2	47.6	83.5	26.2

Figure 41. Percent of households in middle class (top SOL group)

Despite the increase in the percent of urban African households in the middle class shown in Figure 41, not all middle class households experience the same economic situation. Figure 42 shows the percent of middle class households for whom in 2006 the monthly household expenditures exceeded R2500, the percent whose monthly household expenditure exceeded R5000, and the percent whose monthly household expenditure exceeded R10,000.[9] This is not shown for rural Africans, for whom less than 2% of households were in the middle class.

The monthly household expenditure of middle class White or Asian households is much more likely to be above R2500, above R5000, and above R10000 than for middle class Coloured or middle class urban African households. Similarly, the monthly expenditure of middle class Coloured households is more likely to be above R2500 per month or above R5000 per month than for middle class urban African households. The percent of both middle class urban African and of middle class Coloured households with monthly expenditure above R10000 is very low (2-3%).

[9] The General Household Surveys in 2002 and later asked a question about total household expenditures in the previous month. This was coded in eight categories, with less than R400 as the lowest category and R10,000+ as the highest category. This is a rough indicator of monthly household income or monthly household consumption. The exchange rate of the South African Rand has fluctuated between about 5-12 to $1US Dollar in this time period.

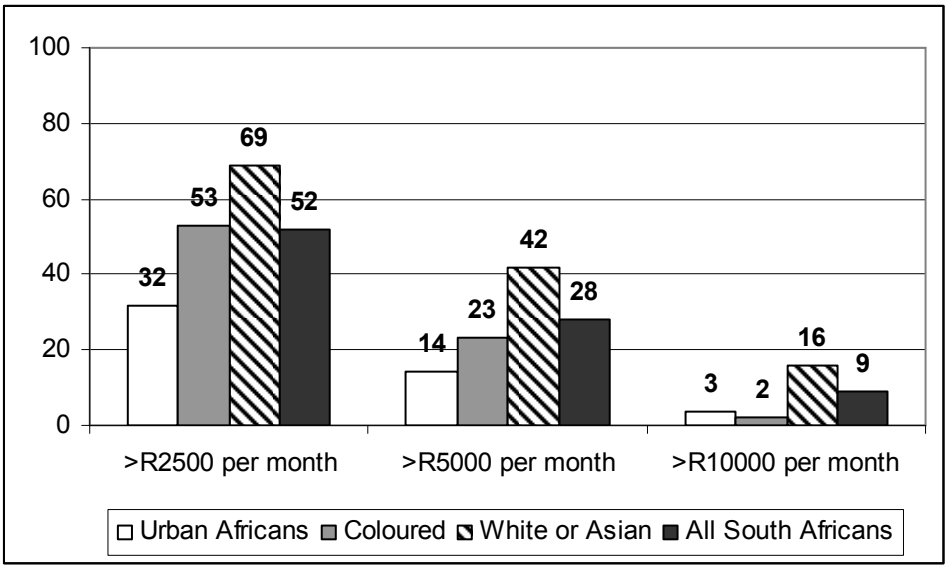
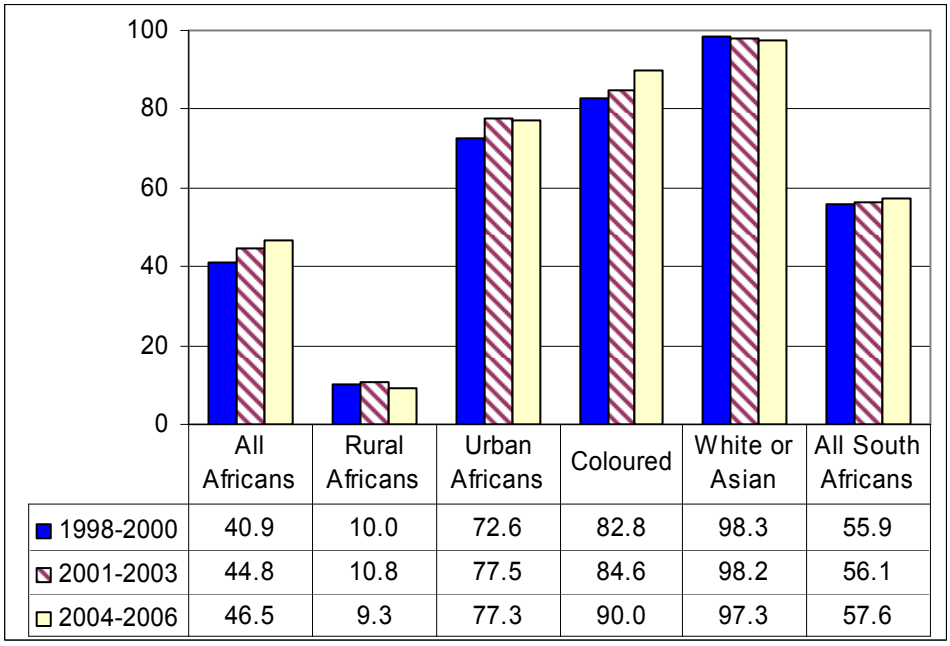


Figure 42. Percent of middle class households with monthly expenditure greater than R2500, greater than R5000, and greater than R10000, 2006



	All Africans	Rural Africans	Urban Africans	Coloured	White or Asian	All South Africans
1998-2000	40.9	10.0	72.6	82.8	98.3	55.9
2001-2003	44.8	10.8	77.5	84.6	98.2	56.1
2004-2006	46.5	9.3	77.3	90.0	97.3	57.6

Figure 43. Percent of households with decent drinking water and decent sanitation (Top two SOL groups)

Figure 43 shows the percent in the top two standard of living categories within each group. As in Figure 41, the values shown are averages over a three-year period. These households have both decent water and decent sanitation, something to which all South African households aspire. This percent had increased in each period for Coloured households, reaching 90% by 2004-2006. It also increased after 1998-2000 for urban Africans, but there has been no substantial increase for rural Africans. Even in 2004-2006, less than half of all Africans had both decent sanitation and a decent source of drinking water.

Households with a decent standard of living are not all equally likely to be above some expenditure threshold. Figure 44 shows the percent of households in the top two SOL groups which had monthly expenditure of R800 or more in 2006. The overall picture is similar to that in Figure 42. Within a given standard of living group, White or Asian households are the most likely to have monthly expenditure above a particular value, with Coloured households somewhat less likely and with urban African households even less likely. Forty-five percent of African households with a decent standard of living had monthly expenditure of less than R800.

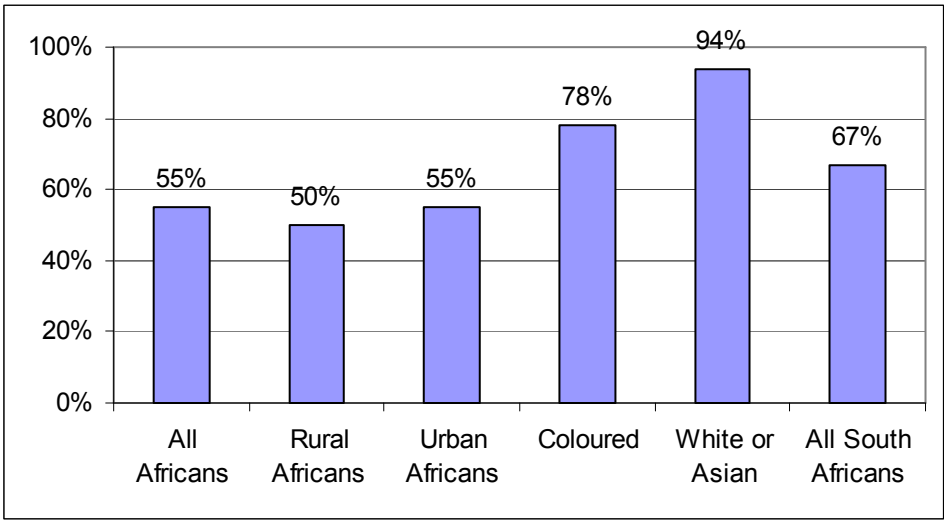


Figure 44. Percent of households with a decent standard of living (Top two SOL groups) with monthly expenditures greater than R800, 2006

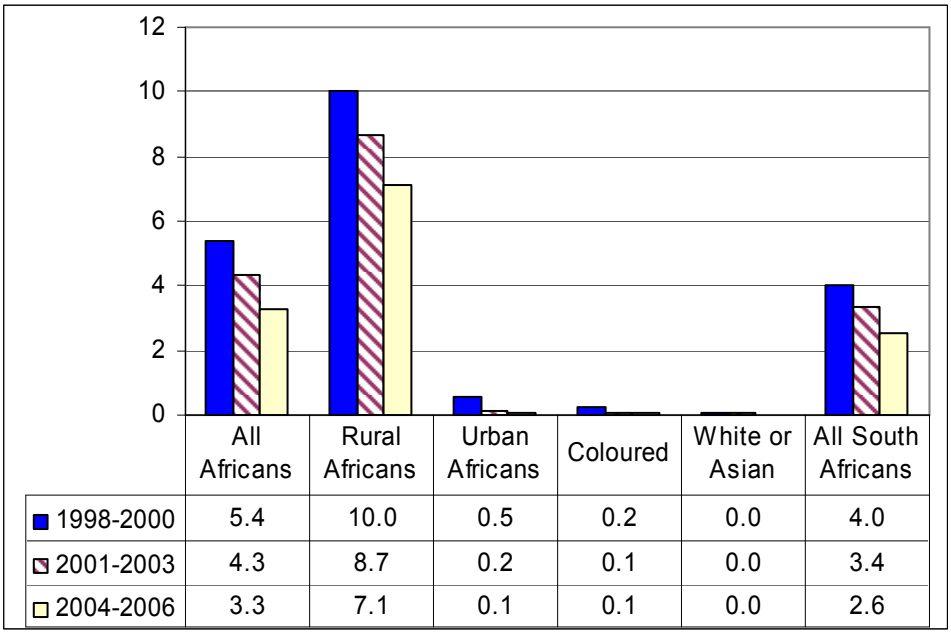
Fifty percent of rural African households in the top two SOL groups have monthly expenditure of over R800, but this is true for 55% of urban African households in the top two SOL groups. Note from Figure 43 that while 78% of urban African households are in the top two SOL groups, this is only true for 8% of rural African households.

Figure 45 shows the percent of households by group over time in the bottom standard of living category, again as averages over three year periods. There has been a steady decline in the percent of rural Africans in the lowest group, but even in 2004-2006, 7% of rural African households remain in a dire situation of standard of living. Also, in 2006, Thirty-nine percent of the rural African households in the lowest SOL group had monthly expenditures of less than R400 in 2006.

Virtually all of those in the bottom group were rural African households. In fact, in 1998, 94.8% of those in the lowest SOL group were rural African households, and in 2004, 98.8% of those in the lowest SOL group were rural African households. It is useful to examine somewhat further the characteristics of those rural African households which are in the lowest group. We will look at rural African households in the lowest group in comparison to all rural African households in 2004.

In 2004, 62% of those rural African households in the lowest group are headed by a female, in contrast to 45% of rural African households that are not in the lowest group. This high level of female-headedness seems mainly related to a disproportionate number of these female heads being widows – 53% of female heads of households in the lowest group compared to 42% of other rural African female-headed households.

Thus, this is not a situation where the husband or significant other is absent due to labour migration. It could be that female-headed households without an adult working for pay elsewhere are especially disadvantaged in their efforts to move out of the situation of absolute poverty in which the lowest SOL group lives.



	All Africans	Rural Africans	Urban Africans	Coloured	White or Asian	All South Africans
1998-2000	5.4	10.0	0.5	0.2	0.0	4.0
2001-2003	4.3	8.7	0.2	0.1	0.0	3.4
2004-2006	3.3	7.1	0.1	0.1	0.0	2.6

Figure 45. Percent of households in lowest SOL group

Concluding Comments

Since 1998, some aspects of the lives of South Africans have definitely improved. An increasing percent of all households have: (1) access to clean water, (2) access to a telephone, either through a landline in the dwelling or through a cell phone possessed by a household member, and (3) electricity as the major source of light. A decreasing percent of South African households have no sanitation or use a bucket toilet for sanitation. Also, an increasing percent of urban African households and of Coloured households has arguably entered the middle class as indicated by standard of living meaures. Also the percent of Coloured households and of urban African households that have a decent standard of living has increased over time. The overall percent of South African households in the middle class, though, has changed little, remaining at about 25%.

White or Asian households experienced a very good standard of living throughout the time period considered. There is little evidence of any deterioration in this over time.

Some might expect that the situation of Coloured households and of urban African households would be similar. For the most part, they do not look similar. Rather the situation of Coloured households is far better than that of urban African households.

Let us look at how some indicators of a very poor standard of living have changed for all South African households (Figure 46), for rural African households (Figure 47), and for urban African households (Figure 48).

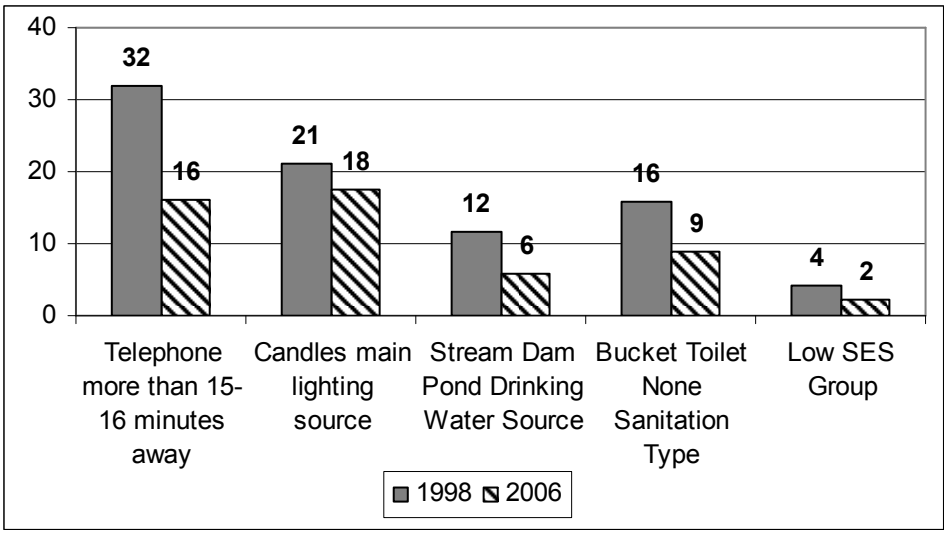


Figure 46. Percent of all South African households with a poor standard of living: 1998 and 2006

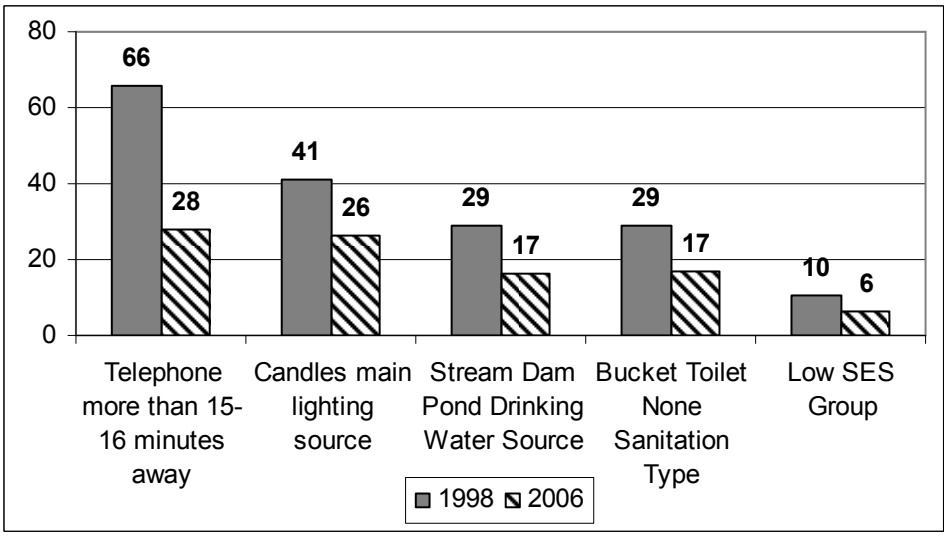


Figure 47. Percent of rural African households with a poor standard of living: 1998 and 2006

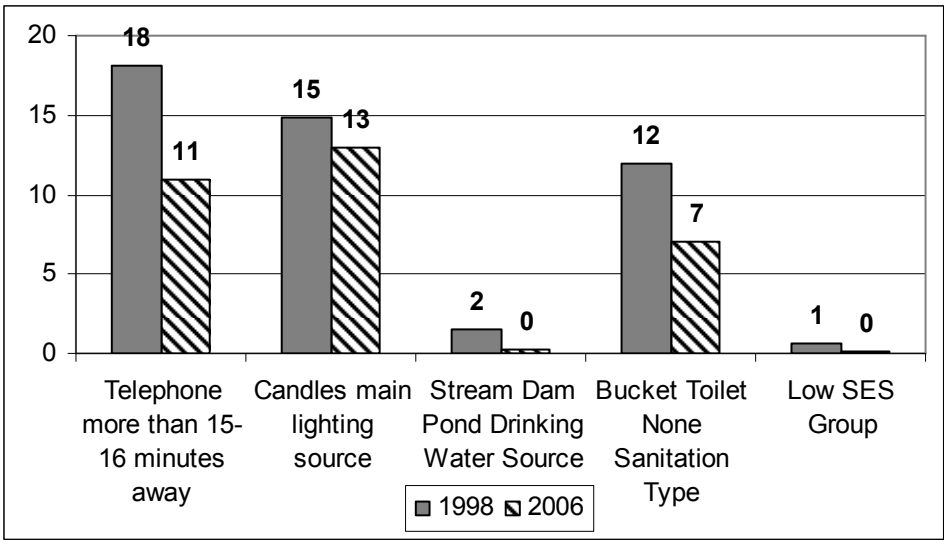


Figure 48. Percent of urban African households with a poor standard of living: 1998 and 2006

Note that the scale in these three figures differs (0%-40% in Figure 46, 0%-80% in Figure 47, and 0-20% in Figure 48). The scale was changed among the figures so that variations within each figure would be clear.

For all South African households, rural African households, and urban African households, there was a substantial decline between 1998 and 2006 in the percent of households in the worst situation in each of the areas considered in these figures. This indicates true poverty alleviation. Whether the pace of this poverty alleviation should have been more rapid is a matter for policy debate. Some aspects of the improvements indicates in Figures 46-48 are mainly the result of South African governmental actions, while other improvements probably have little to do with governmental action. The South African government deserves credit for encouraging rural electrification. But improvement in telephone availability is mainly the result of the commercial effort of cell phone companies. The South African government has worked to improve the quality of the drinking water supply, and has worked to eliminate bucket toilets, but the reduction in the percent of rural African with no sanitation is the result of households or village groups digging holes for latrines.

The 2005 report on South Africa's progress toward its Millennium Development Goals expresses and sets goals concerning the situation of slumdwellers (South Africa, 2005: 8, 52, 56). This referred to urban African households, especially concerning their sanitation situation. Although much could be improved in the sanitation situation of urban Africans, it seems clear that the sanitation situation and other aspects of the lives of rural Africans are in much more need for improvement than urban Africans. In urban areas, with denser settlement, improvements in sanitation and other aspects of life are likely easier and less costly on a per household basis than for more sparsely settled and remote rural households. However, it seems clear that the greatest need for improvement in the standard of living and alleviation of severe poverty remains with rural African households. Providing a poor rural household with a pit latrine in place of a bucket toilet does not increase that household's purchasing power and does not directly contribute to South African economic growth, but it does improve the standard of living, convenience of daily life and likely health of that rural household.

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Data Appendix

Decision not to use the data from the 1995-1997 October Household Surveys

The 1995-1997 October Household Surveys had some deficiencies, compared with the surveys conducted in 1998 and later. The African sample for the 1995 survey seems to have been drawn from disproportionately relatively well-off areas, leading to an estimated decline in the welfare of Africans between 1995 and 1996, even when this is not plausible (REFS). For example, for 1995, it was reported that 32% of all African households had a water tap in the dwelling – for each year 1996-2005, the reported percent of African households with a tap in the dwelling never exceeded 26%. Although we used recalculated weights based on the1996 South African Census for the 1995 data, a problem in the 1995 sample for Africans does not totally rectify this.

The 1996 October Household Survey was conducted in the same year as the South African Census, putting a strain on Statistics South Africa resources, with some effects on the quality of that survey (REFS).

In the 1997 October Household Survey, for Africans, the data on sanitation type for Africans is inexplicably good, being substantially better than that reported for either 1996 or 1998. For example, it was reported that in 1997, 19% of rural African households had a flush toilet in the dwelling, while this was reported for 3% of rural African households for both 1996 and 1998. The implausibly better sanitation situation in 1997 compared to 1996 and 1998 also is clear in Romani and Anderson (2002).

Testing for a statistically significant change over time or between groups in a given year

Whether there is a significant change between two dates in the percent of a group with a given characteristic, such as the percent of all South African households in formal housing, can be tested by constructing 95% confidence intervals around the estimates of the percent of households with a given characteristic in each of the years under consideration. Given the assumptions of the measure, the 95% confidence interval is the range within which there is a 95% probability that the true value of the percent lies. The width of the confidence interval depends on the magnitude of the percent and on the number of cases (households) in the group considered.[10] If the 95% confidence intervals for the two years do not overlap, then it is reasonable to conclude that the percent of households with a given characteristic actually changed between the two years.

Figure 4 shows the percent of households residing in formal housing. For each of the six groups considered in Figure 4 there was a statistically significant change in the percent of households in formal housing between 1998 and 2004. That is, for each group, the 95% confidence interval bracketing the percent for 1998 did not overlap with the 95% confidence interval for the percent in 2004. Three groups (all African households, urban African households, and White or Asian households) showed a significant increase, and the other two groups (rural African households and Coloured

[10] To estimate the confidence interval, the household weights for a given survey are multiplied by a constant which results in the number of weighted cases for the given year equaling the number of surveyed cases for that year, but the relative weight of various households is the same as in the survey's household weights.

households) showed a significant decrease. The statistical significance of quite small changes in a percent is partly because the number of households in each group in each year is very large. The smallest group examined in Figure 4, Coloured households in 1998, included over 1500 households.

Just because the change in a percent between 1998 and 2004 is statistically significant, this does not mean that it represents a substantively important change. It is difficult to imagine that a change from 57.9% of African households residing in formal housing in 1998 to 58.5% of African households residing in formal housing in 2004 made an important difference in the lives of members of African households. This change in six years represents an annual rate of increase of .2%, which is unlikely to be meaningful to anyone. This phenomenon when a statistically significant difference is not meaningful is sometimes discussed as the difference between substantive significance and statistical significance (Elifson, Runyon, and Haber, 1990: 336; Spirer, Spirer, and Jaffe, 1998: 143-145, 236-237; Taylor and Frideres, 1972).

Virtually any apparent change over time in any graph presented in this paper is statistically significant. However, we do not think that all of these changes are substantively important. Significance tests are extremely important to protect researchers against making unwarranted conclusions about a change over time or a difference between two groups when the number of cases analysed is fairly small. However, that is not the situation in the analyses in this paper, since typically a large number of households comprises each group considered.

In this paper, we will not mention every time a change over time is statistically significant. Also, we will not discuss as important changes that do not also represent a statistically significant change over time or difference between groups in a given year.

Variability in survey data

The data sources we are using are surveys that take place every year, covering a comparable population and asking comparable questions. These are important advantages of the data sources used.

However, these are not the only considerations that influence the comparability of survey data over time. Sometimes, apart from the possibility of random fluctuations, there are seemingly small changes in the survey administration, such as interpretation of questions by interviewers, that lead to implausibly large changes in some indicator from one year to the next year. These kinds of things occur in surveys in many countries. As discussed, this was part of the reason that we begin the data analysis in 1998 rather than earlier.

We do not interpret large changes in one year when there is a rebound in the subsequent year to a value close to the value in the year before the large change as real. We were able to substantially guard against this in choosing the first year for analysis, but we are more limited in determining whether all values for the last year in the analysis, 2006, has yielded reasonable data in all or almost all areas. We are somewhat cautious in fully accepting results for 2006 that are radically different from what would have been expected based on the results for 2004 and 2005. Fortunately, the results for 2006 appear to be quite reasonable.