

PROJECTION OF THE POPULATION OF THE CITY OF CAPE TOWN 2001-2021

Prepared for: City of Cape Town

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December 2005

CHAPTER 1 INTRODUCTION

The previous report opened with the following lament (Dorrington 2000):

“Estimating and projecting the South African population has never been an easy task because of the paucity of data and the heterogeneous nature of the population. Such work is an order of magnitude more difficult at a regional level where migration is far more significant and not documented at all, and where there may be poorly understood regional deviations in fertility and mortality.

However, the task becomes almost impossible when the country is in the process of transformation. Not only the systems of record keeping change (or in some cases break down completely) but there is also a change in personnel usually leading to a loss in continuity.

In addition to this the country is suffering what is likely to turn out to be the worst HIV/AIDS epidemic in the world and there is only limited understanding of how this will shape our demographic future.

Indeed so huge were the uncertainties involved that it was necessary to re-estimate the national population before estimating the population in the CMA in order to get a better understanding of the pattern of undercount and recent changes in mortality and fertility.”

Unfortunately on average things haven't improved much since then. Although one might have hoped that a second census would allow us to feel more confident about some of the previous results and assumptions, the known undercount (for which the actual count needed to be adjusted) was larger in 2001 than in 1996 and is of such a magnitude that one cannot place any reliance on the small area estimates arising out of either census. By way of example the annual growth rates for the health districts implied by a comparison of the numbers from the two censuses range from - 2.3% for the Central district to 6% for the Eastern district. These appear to be implausible when compared with the annual growth rate for the provincial population as a whole of 2.7%.

However, on the positive side we have more data and a better understanding of the HIV/AIDS epidemic in the province which should improve the projections, although these now have to account for interventions and possible behaviour change which generally increase the level of uncertainty. In addition the 2001 census provides data on migration from 1996-2001 which allows us to derive more reliable estimates than was the case in the previous projection.

As was mentioned in the previous report demographers are careful to warn users of demographic projections that projections are not predictions but rather vehicles for better understanding the way the population may change in future. This warning is particularly relevant to projections of regional populations within South Africa today.

This report describes efforts to estimate the current population in the City of Cape Town and to project the population forward to the year 2021 in accordance with the project proposal in Appendix 10.

There are two distinct, although interrelated, phases to the study. Only the first phase is covered here.

In particular, the population for the City¹, split by population group, sex and age in five-year age groups, has been projected from the base year of 2001 to the year 2021 at five yearly intervals,

¹ The City of Cape Town consists of the following Health Districts: Central, Eastern, Khayalitssha, Klipfontein, Mitchell's Plain, Northern Panorama, Southern, and Tygerberg.

taking into account the possible impact of the HIV/AIDS epidemic and treatment and prevention interventions.

These numbers have been distributed between the eight Health Districts.

CHAPTER 2 THE BASE POPULATION AS AT OCTOBER 2001

Before we can project the population we obviously need to decide on a starting point. The 2001 Census (in the form of the Community Profile provided by Stats SA) is the obvious choice. Unfortunately a number of potential deficiencies with the overall census results have been identified by the Census Sub-committee of the Statistic Council (Statistics Council 2003) and the Census estimates for the for the City need to be investigated in this regard (and for any other deficiencies).

As was the case with the 1996 Census respondents self classified themselves into population groups. As a result some people were unclassified by population group. At the national level this amounted to less than 1% and hence is of little consequence, however, for the Western Cape and some health districts in particular, as was found in the previous census, the figures were higher. What is different in the case of the 2001 census was the fact that the data were edited and such cases were allocated a population group, and it is unlikely that one can do much better than accept these edits.

The editing of the 2001 census data also allocated ages to those without age (again less than 1% of all data) and again it is unlikely that one can improve on this process so these edits were accepted.

These data are presented in Table 1 (more detail in Appendix 1):

	<i>Male</i>	<i>Female</i>	<i>Total</i>
African	448	469	917
Coloured	662	730	1 393
Indian	21	21	41
White	259	284	543
Total	1 389	1 504	2 893

Table 1: 2001 Census results (thousands)

Thus, ignoring any minor changes to overall boundaries according to censuses the population has increased from 2,558 million to 2,893 million (an increase of some 12%), with the biggest increase being in the African population (258 thousand or 33%), followed by the Coloured population (95 thousand or 7%) and then the Indian population (5 thousand or 13%). In contrast the White population fell by some 21 thousand or 4%.

2. Deficiencies in the Census

During the review of the Census, *inter alia*, the following potential deficiencies with the results for the total population were identified (Statistics Council 2003):

1. under-enumeration of the 0-4 year olds
2. too few foreigners identified
3. age misstatement, particularly age exaggeration, particularly across the pension age for both males and females
4. too few male in-migrants and/or significant male undercount (relative to the number of females).
5. an excess of teenagers

- 6. potential significant undercount of the White population.
- 7. slightly greater than expected Coloured population.

Each of these deficiencies needs to be investigated when assessing the acceptability of the estimate of the population for the City.

3. Comparison of previous projection with the 2001 census estimates

The figures below compare the sex ratios and the numbers of females by age of the previous projection (Dorrington 2000) with the equivalent numbers from the 2001 census. Included on these figures as well are the results of a modified projection (New96proj) taking into account the lessons learnt from these comparisons and additional information which from Census 2001.

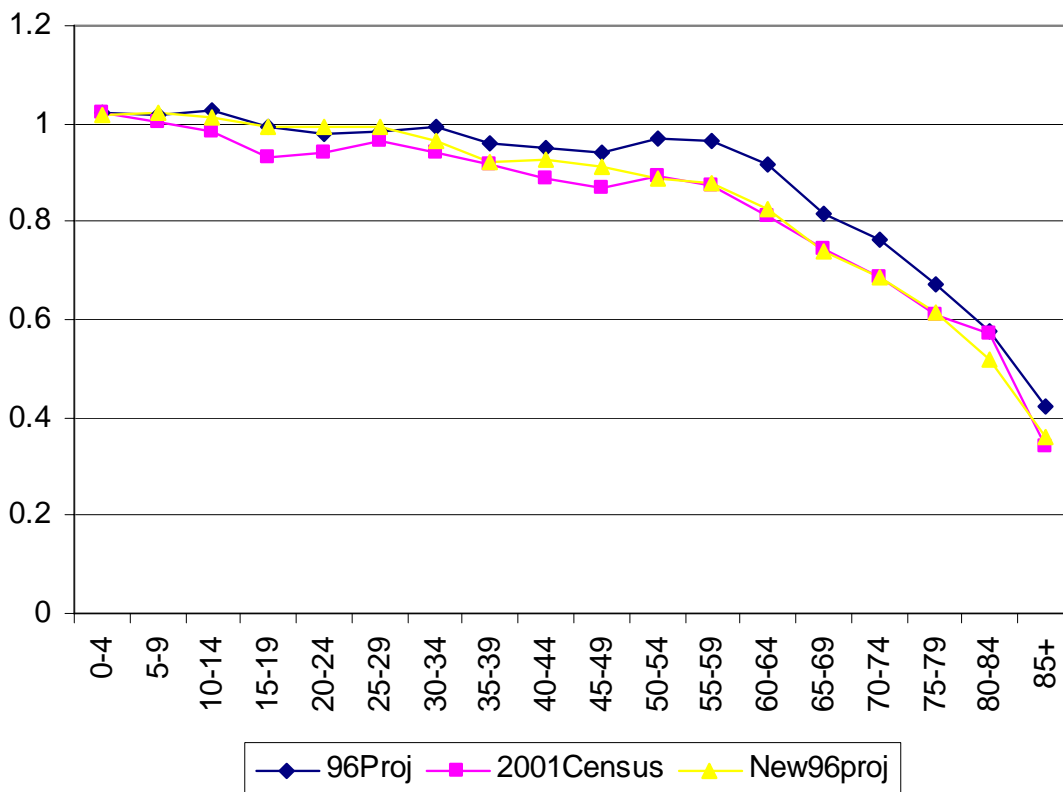


Figure 1: Male to female ratio: Total population of the City of Cape Town, 2001

The overall male to female ratio of the 2001 Census data is 92.4% whereas that of the previous projection are about 96.9% (suggesting an undercount of males relative that of the females of some 4.5%). The overall sex ratio in the previous census was 94%, which supports the conclusion that the 2001 census undercounted men relative women to a greater extent than the 1996 census. Analysis of the results by population group leads to the conclusion that in total the number of males needs to be some 2.1% higher than was estimated by the 2001 census.

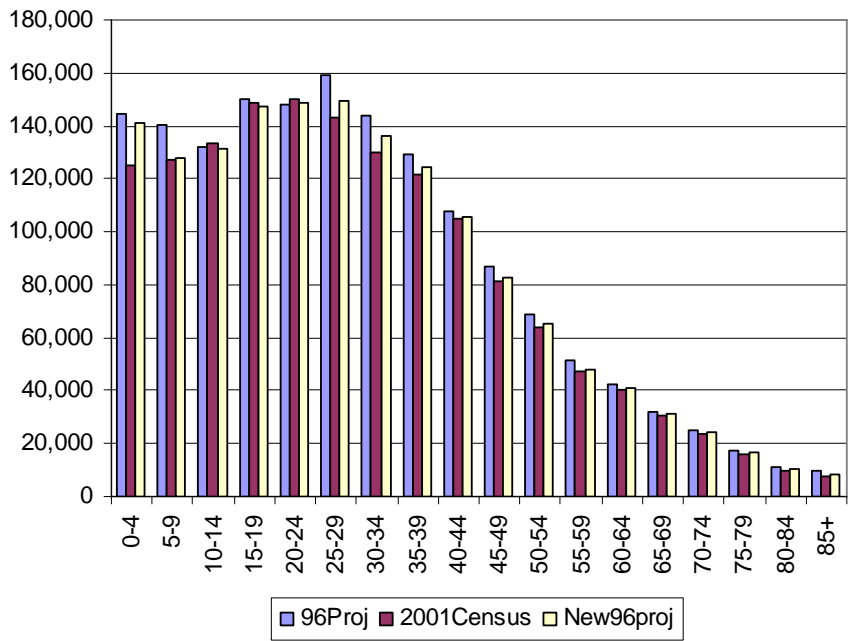


Figure 2: Female population of the City of Cape Town, 2001

The results of the previous projection are reasonably close to the census estimates with the exception of the 0-9 and 25-39 age range, although they are slightly higher for all ages above 39. In order to understand the numbers better and to decide on a basis for projecting the population forward we now consider each population group separately.

3.1 Coloured

From Figure 3 we see that the projected numbers from the previous projection exceed the census numbers on the 0-9 age range in particular. While some of this difference is due to undercounting in the census, it was decided that since the previous census seemed to count the children fairly well only some, maybe half of this difference, was due to undercount. Otherwise the estimates from the previous report were assumed to be accurate and these numbers projected forward on the basis described in the next chapter.

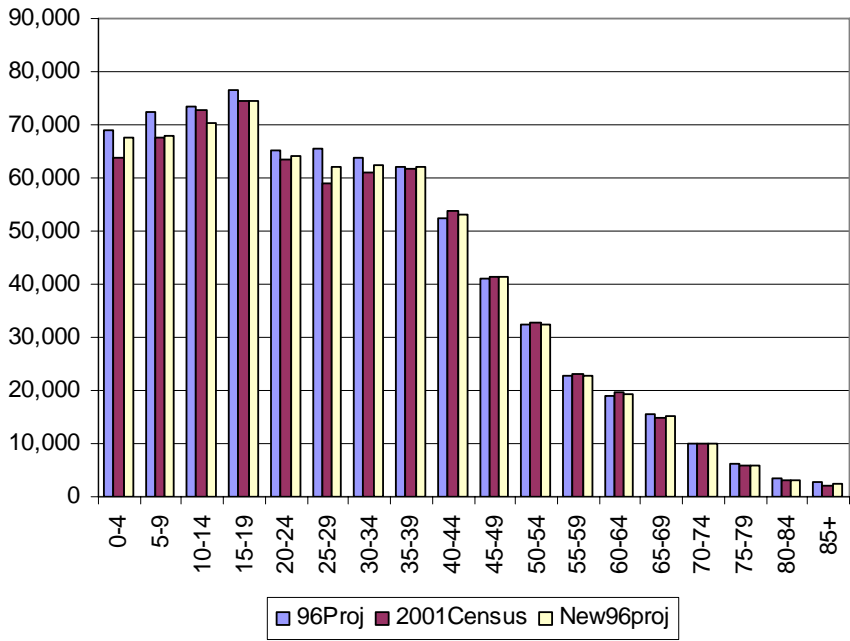


Figure 3: Number of Coloured females, 2001

The overall sex ratio from the previous projection was 93.2% compared to 90.7% implied by the numbers from the 2001 census (suggesting an undercount of males relative to females of some 2.5%). Given the assumed accuracy of the number of females and the fairly low implied sex ratio from the projection it was decided to accept the sex ratio projected from the 1996 base population using the projection basis outlined in the next chapter. According to the comparison in Figure 4 this implies an undercount in men aged 20-49 and over 75.

Although it is possible that adjusting the 1996 estimate so as to produce projected numbers that are an average of the census numbers and those projected from the 1996 base population might produce a better estimate, it was decided that the difference in numbers was too small to warrant the extra work involved in so doing.

The result of these changes is to add only about 27 000 lives (1.9%) to the 2001 census estimates (increasing males by 20 000 and decreasing females by 6 000). The results appear in Appendix 3.

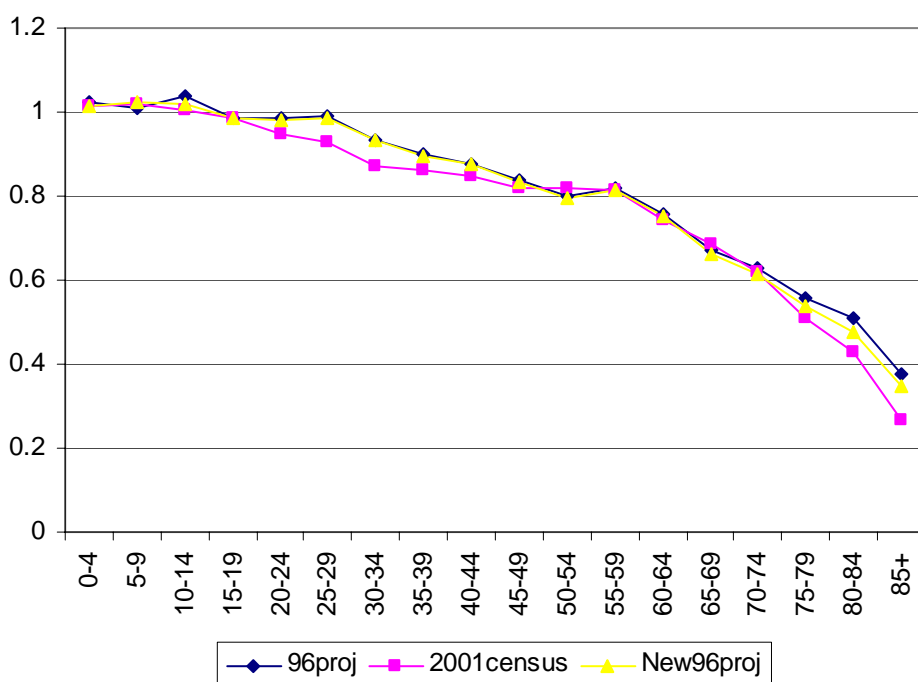


Figure 4: Male to female ratios: Coloureds, 2001

3.2 African

As can be seen from Figure 5 the previous projection appears to have exaggerated the numbers aged 0-9, underestimated the numbers 10-24 and exaggerated the numbers 25-39. After analysis it was decided to assume that difference in the 0-9 age range was due to an undercount in the census and the difference in the 10-19 age range was due to an exaggeration of the numbers in the 2001 census, both consistent with what was observed at the national level. In the absence of any information to the contrary it was decided to accept the census numbers in these age ranges and to attribute the difference to errors in the pattern and level of migration assumed in the previous projection. This implies 1 500 too few in-migrants in the 20-24 age range and 2 000, 6 000 and 2 000 too many in the next three age bands, 25-29, 30-34 and 35-39. These have been allowed for in the projection basis described in the next chapter.

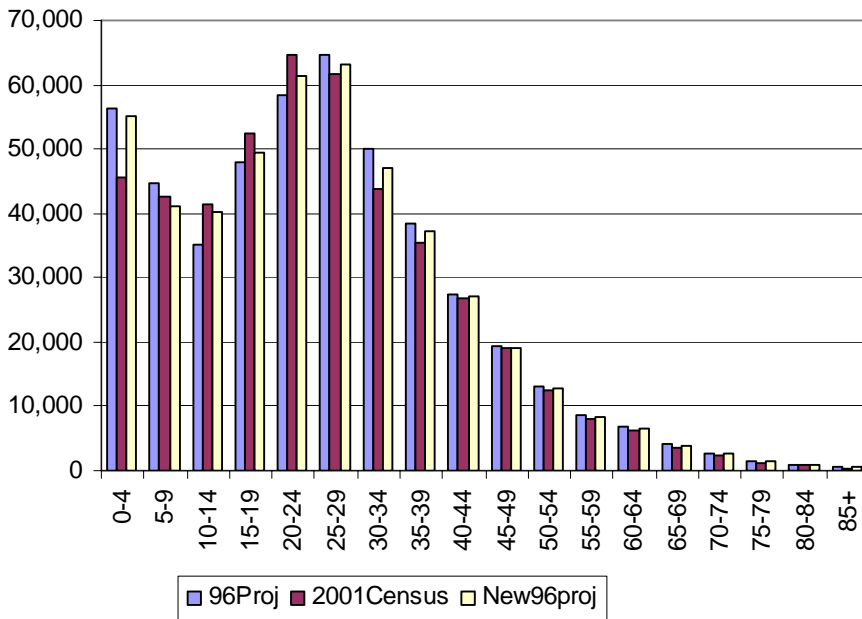


Figure 5: Number of African females, 2001

As noted in the previous report there was a significant difference between the projected sex ratios and those implied by the 1996 census estimates. In the absence of more information it was, at that time, decided to use a smoothed set of ratios based on previous projections. As can be seen from Figure 6, while these ratios are consistent with or more plausible than those derived from the 2001 census estimates up to the 20-29 year age group, the two sets of ratios again differ significantly, and it has to be said, implausibly, above that age. This time, however, given the consistency in ratios from the two censuses it seems more appropriate to use a smoothed set of sex ratios that is broadly consistent with those found by the two censuses.

The effect of these adjustments was to add around 35 000 (3.7%) to the total African population, a little over 25 000 to males, and little over 9 000 to females.

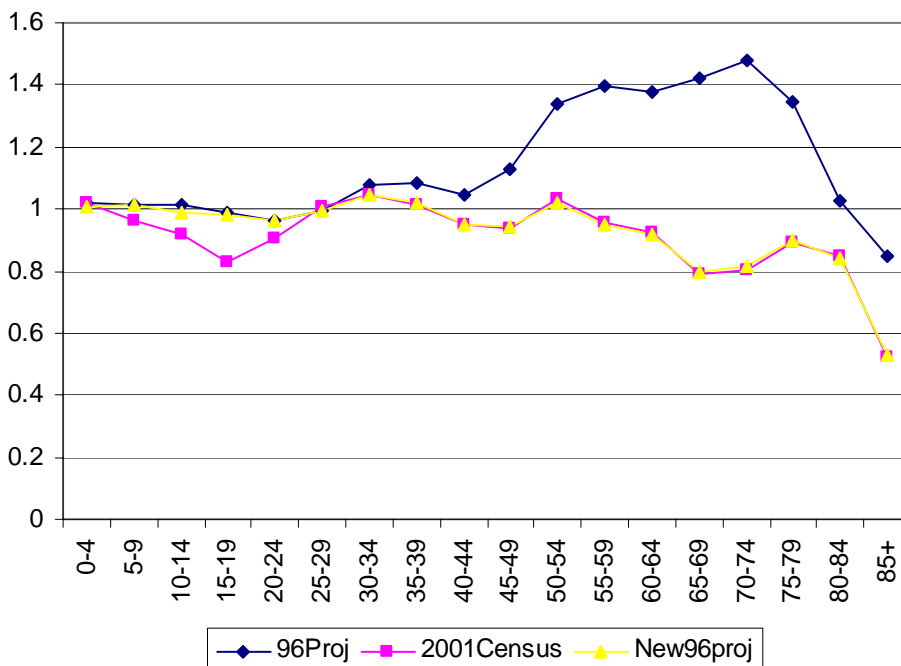


Figure 6: Male to female ratios: Africans, 2001

3.3 White

The previously projected population is much higher than the number estimated by the census. While some of this is likely to be due to an undercount in the 2001 census much of it is due to an underestimate of the emigration of Whites, particularly in the 20-29 age group in that projection. In addition to adjusting the emigration to be consistent with the levels estimated from the 2001 census and data from the main receiving countries, it was decided to assume an undercount of some 5% (which is a somewhat arbitrary allowance for undercount which is less than assumed previously). Although it is possible the undercount is bigger than accounted for in these figures it does not make sense to keep allowing for such a substantial undercount without further evidence as to its magnitude when two censuses have failed to identify it.

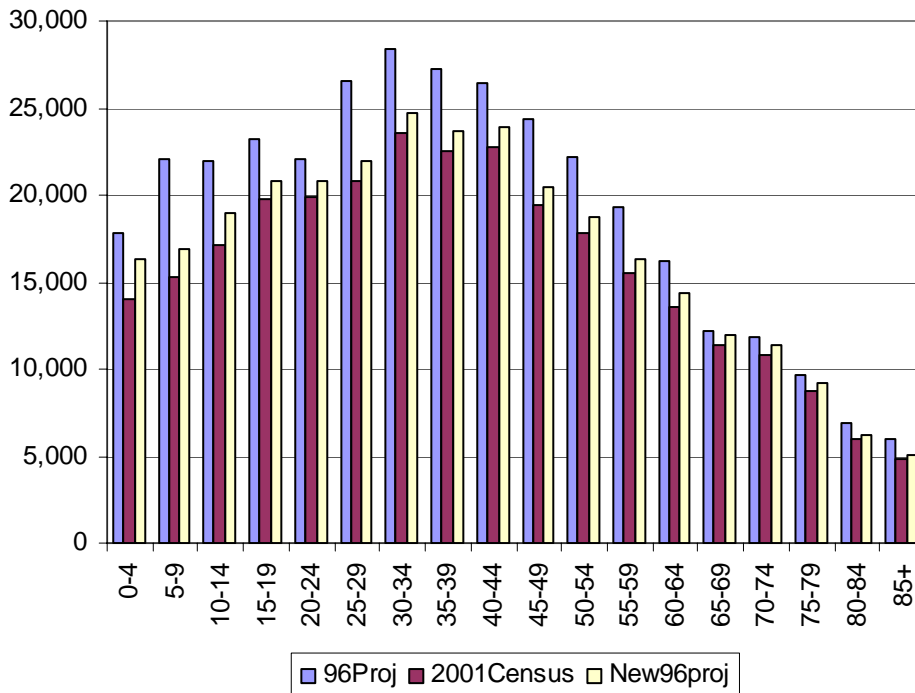


Figure 7: Number of White females, 2001

The sex ratios (Figure 8) of the projected population were accepted as being more reasonable than those from the 2001 census on the grounds of arguments in the previous report, with the exception of the 25-29 year age group where it is assumed that there has been significantly higher emigration of young men than women, in line with the picture at the national and provincial levels.

The net effect of these changes is to add a total of about 36 000 (6.3%) to the number of Whites, 19 000 males and 18 000 females.

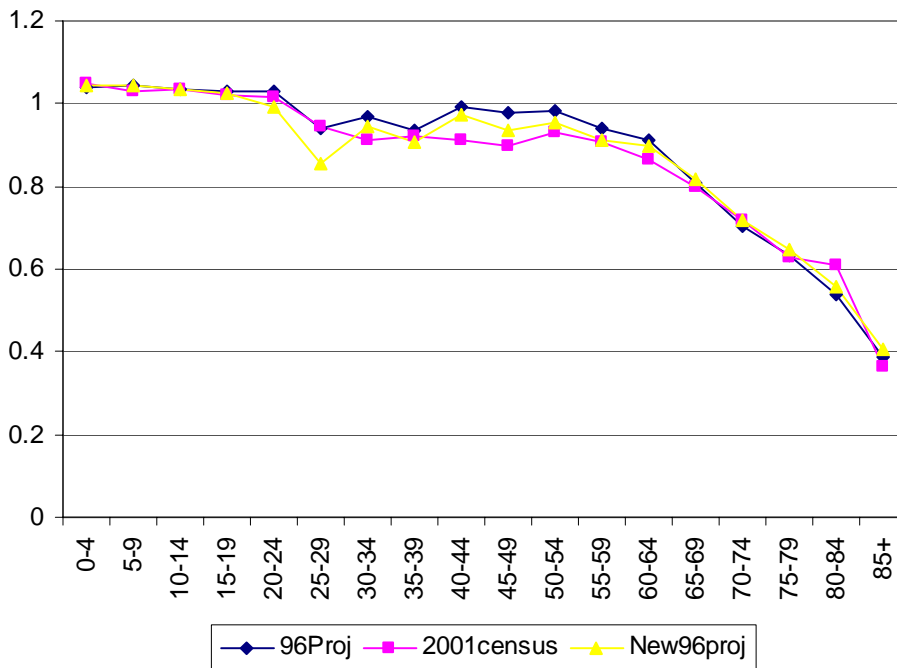


Figure 8: Male to female ratios: Whites, 2001

3.4 Indian

The Indian population in the City is very small, in fact too small for one to be able to rely on the estimates from the census, given the level of adjustment they contain (as can be seen by the difference between the projected numbers from 1996 and the 2001 census). Although such small numbers do not warrant detailed analysis the figures have been included for completeness.

Given the unreliability of the censuses it was decided to adjust the 1996 base population such that the projected numbers over age 4 were an average of the 2001 census numbers and the projected numbers before adjustment. In addition the sex ratios were smoothed to produce a more plausible sequence by age. The net effect of this change is to increase the population by 3 200 (7.1%), equally split between males and females.

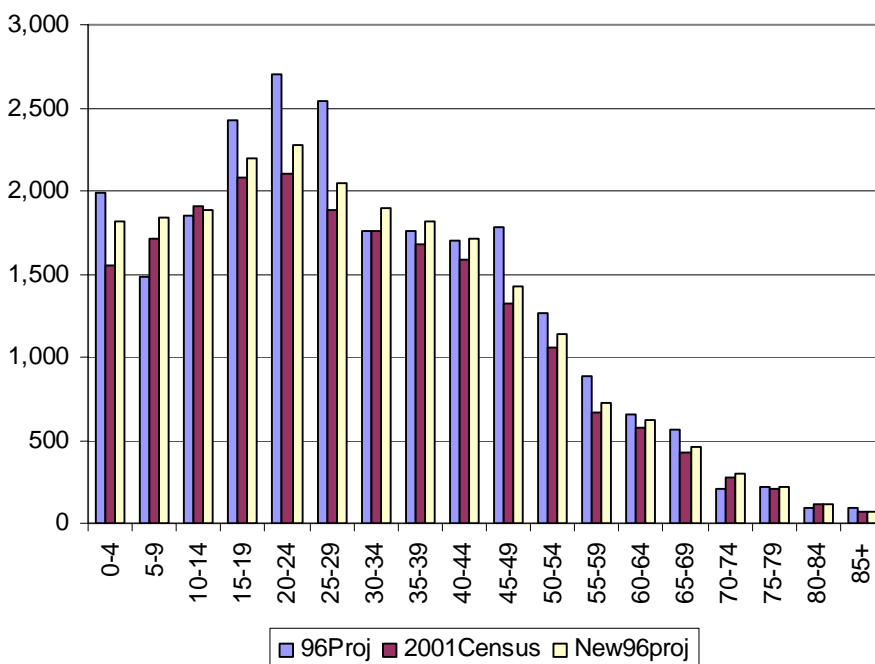


Figure 9: Number of Indian females, 2001

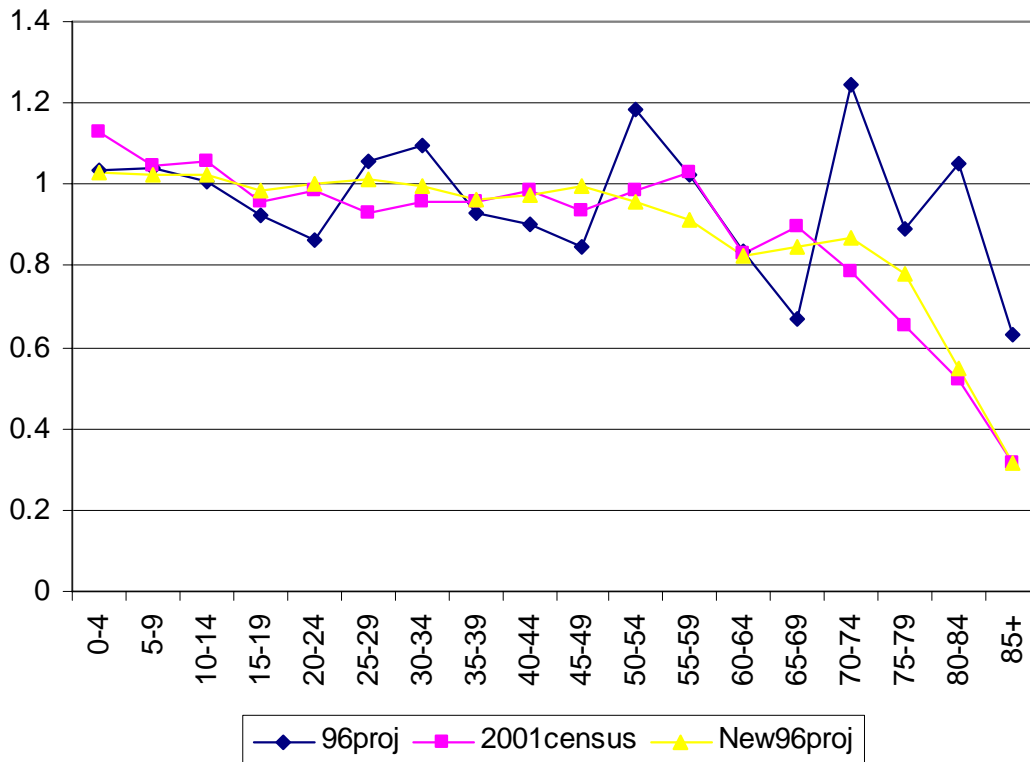


Figure 10: Male to female ratios: Indians, 2001

3.5 Total

The overall effect of all these changes is to add some 102 000 (3.4%) to the total population of the City as of the date of the census in 2001, to give the following totals (details in Appendix 3):

	<i>Male</i>	<i>Female</i>	<i>Total</i>
African	473	478	951
Coloured	683	737	1 420
Indian	22	23	45
White	277	302	579
Total	1 455	1 540	2 995

Table 2: Numbers in the City of Cape Town as at mid-year in 2001 (thousands)

4. Distribution by health district

Unfortunately, as mentioned in the introduction, the extent to which the censuses needs to be adjusted for undercount on the basis of a very small post-enumeration survey is such as to undermine completely any confidence one might have in estimates of small populations. Although it would appear that the provincial estimates are consistent from one census to the next it is not clear, at this stage, what minimum size of population/area in the Western Cape is needed in order to be able to rely on the census estimates. As can be seen from the growth rates implied by a comparison of the numbers by health district in each census shown in Table 3² one can't rely on numbers for populations this small.

² Data supplied by Janet Gie.

	1996	2001	Growth
Central	323 761	288 410	-2.3%
Eastern	295 590	398 050	6.0%
Khayalitsha	255 693	329 000	5.0%
Klipfontein	332 279	344 486	0.7%
MP	338 010	401 092	3.4%
Northern Panorama	362 191	419 153	2.9%
Southern	294 429	310 810	1.1%
Tygerberg	387 289	400 876	0.7%
City	2 589 242	2 891 877	2.2%
Western Cape	3 957 317	4 524 335	2.7%
CT/WC	65%	64%	

Table 3: Growth rates by health district implied by 1996 and 2001 census results

The numbers of people living in the various health districts (HDs) was determined by applying the population group-sex-age correction factors implied by the estimates derived in section 3 to each population group-age-sex combination within each health district.

The detailed results of these calculations appear in Appendix 3. These can be summarised as follows:

	Health District								Total
	Central	Eastern	Khaya.	Klipf.	MP	NP	South.	Tyger.	
Total	326 373	378 060	315 769	361 782	400 145	458 178	326 895	427 577	2 994 779

Table 4: Adjusted 2001 Census results by health district

5. Distribution of the underestimate

The percentage additional undercount implied by the above estimates is as follows:

	Male	Female	Total
African	5%	2%	4%
Coloured	3%	1%	2%
Indian	5%	7%	8%
White	7%	6%	6%
Total	5%	2%	3%

Table 6: Percentage additional undercount in the 2001 Census for the City

	Health District								Total
	Central	Eastern	Khaya.	Klipf.	MP	NP	South.	Tyger.	
Total	12%	-5%	-4%	5%	0%	9%	5%	6%	3%

Table 7: Undercount by health district

CHAPTER 3

POPULATION PROJECTIONS

In order to project the population we need to make assumptions about:

- Fertility (including the impact of HIV on fertility)
- Mortality (including the impact of HIV on mortality)
- Migration
- The prevalence patterns and future spread of HIV and AIDS, taking into account possible interventions.

1. Fertility

In all cases the total fertility rates (TFRs) were kept the same as those used in the previous projection Dorrington (2000) to project from the base population to 2001. Since, for the purpose of the projections in this report, it was decided to start all projections from 1985 to allow fully for the historical impact of the HIV/AIDS epidemic, TFRs were needed going back in time. These earlier TFRs were derived by extrapolating the recent TFRs back in time in such a way as to reproduce the base population for the cohort born since 1985.

Age-specific fertility rates (ASFRs) were derived by scaling the provincial age-specific fertility rates to sum to the TFRs for the City for each of the population groups.

The fertility rates are summarised in Appendix 2.

2. Mortality

Non-HIV:

In the absence of estimates of mortality specific to the city provincial mortality rates were used for each of the population groups. Explanations of the derivation of these rates can be found in Dorrington, Moultrie and Timæus (2004) and the meta data report for the ASSA2003 model which is due to be released at the end of November.

HIV:

The impact of HIV on mortality was modelled using the ASSA2003 AIDS and Demographic model (see meta data report of the model to be released at end of November) calibrated as described below.

The mortality rates are summarised in Appendix 2.

3. Migration

Migration is undoubtedly the most difficult demographic variable to predict and thus it was decided to carry out projections on three migration assumptions corresponding with those made in the previous projection. The numbers of migration 1996-01 by sex and age are given in Appendix 4. By and large the level of net migration appears to have been very low for all but the African population group where it is around 3.5% per annum. The child migration numbers for the Coloured population group are the result of assuming the same pattern of migration for the City as for the province, however, in all likelihood these should be negligible and the fertility of the population in the City should probably be a little lower to account for this difference. However, the net effect on the projections is negligible.

High: The migration experience over the 1996-01 period for the African, Coloured and Indian populations, is assumed to continue in the future in absolute terms (i.e. numbers), while the White net emigration is assumed to cease from 2001.

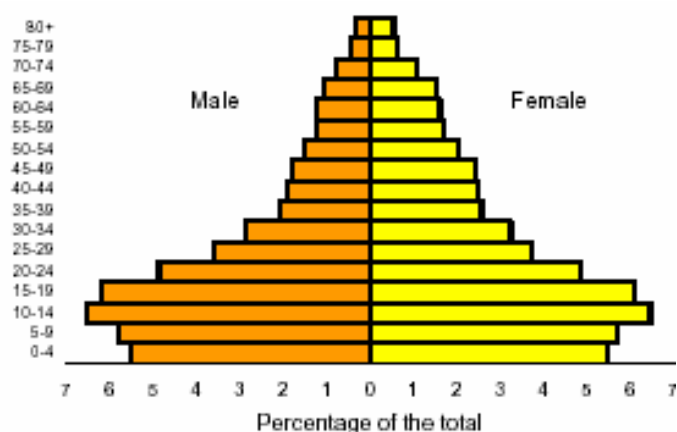
Low: Migration falls from the 1996-01 levels to zero over a 15-year projection period for the African, Coloured and Indian populations, and to rise over 30 years for the White population.

Middle: Migration falls from the 1996-01 levels to zero over a 30-year projection period. This is the assumption used for the detailed projections.

These scenarios produce lower migration than was the case in the previous projection which may well call their reasonableness into question. However, it was decided to stick with these scenarios for the following reasons:

1. There is a diminishing pool of potential migrants. Most in-migrants to the Western Cape (and hence to a lesser extent Cape Town) come from the Eastern Cape. The Eastern Cape has experienced very high out-migration over the recent past and as can be seen from Figure 11 this has now distorted the population pyramid to the point that one must start to question the likelihood of seeing significant numbers of migrants among the older adults.

In addition much of provincial in-migration is to the towns, particularly places along the coast like George, Mossel Bay, Knysna and Plettenberg Bay.



Source: Statistics SA (2005): 21

Figure 11: Mid-2005 population pyramid for the Eastern Cape

2. Although the number of in-migrants net of out-migrants for the province estimated by Stats SA for the period 2001-2006 is more than double the number that would be consistent with the middle projections, their mid-2005 estimate of the population in the province is some 6% (285 000) lower than the provincial estimate that is consistent with the middle projection for the City. The two populations are compared in Figure 12.

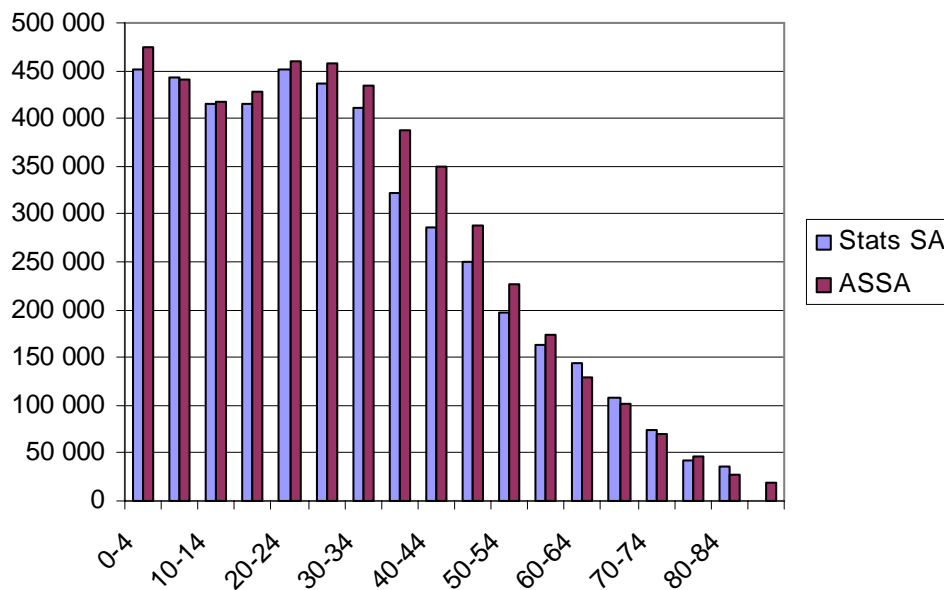


Figure 12: Comparison of the estimated population for the province with that from Stats SA mid-2005 estimate

4. HIV/AIDS

The impact of HIV/AIDS was allowed by using the ASSA2003 AIDS and Demographic model (Actuarial Society of South Africa, 2005) calibrated to fit the ante-natal survey results for the Western Cape. In order to do this it was necessary, by a process of iteration, to find the starting population which, when projected forward to 2001 would, more-or-less, reproduce the base population arrived at earlier. The model also allows for the roll out of ART and other interventions to province-specific levels. In the absence of better estimates of the likely level of roll-out of interventions for the city the projections in this report assume the same level of roll-out as for the province as a whole.

5. RESULTS

The results of these projections appear in Appendices 4 to 6, and are shown graphically in Figure 13.

Details by population group, age and sex for the middle projection are given in Appendix 4, showing that the total population would, on these assumptions, grow from 3 million in 2001 to some 3.4 million by the year 2031.

Appendix 6 compares the total population estimates based on the high and low migration assumptions with those based on the middle migration assumptions. From this comparison we can see that the population in the City in 2021 could range, on these assumptions, between a low of 3.4 million and a high of 4.1 million.³

³ This represents a 20% margin of confidence which compares very favourably with, for example, that of Haldenwang's (1999) high and low national estimates when one bears in mind the uncertainties associated with regional projections.

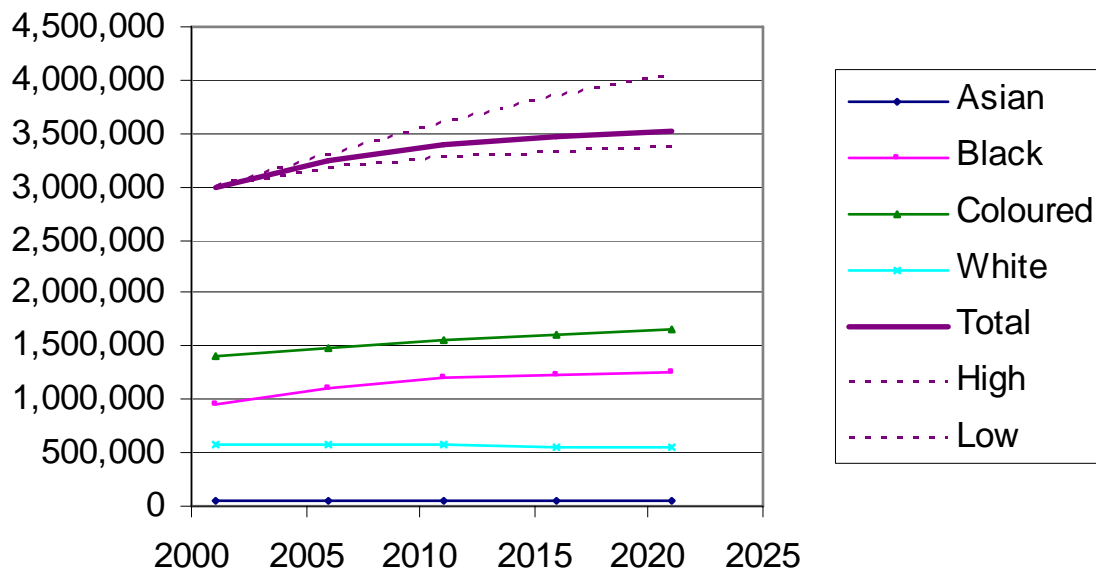


Figure 13: Total population projections

In order to estimate the population by health district the ratio method (Shryock and Siegal, 1976) was employed. However, given the unreliability of the census estimates at this level it was decided to estimate the population in the health districts to be the average of the 1996 and 2001 census estimates at the point half way between the censuses. In order to estimate the population numbers as at the census dates it is necessary to decide on the likely growth rates for the districts. As a first pass the populations were assumed to have grown at rates that were roughly comparable with those of the previously demarked MLCs (Metropolitan Local Councils) into which the health districts fell, as shown in Table 8. These estimates were then presented to experts from the city from which arose as second set of estimates. These two sets of estimates were combined along with a third set based on the growth in the numbers of housing plans approved to produce the final estimates shown in Table 8.

<i>Health District</i>	<i>Growth rate from censuses</i>	<i>Previous MLCs</i>	<i>Range of growth rates</i>	<i>Growth rate assumed for health district</i>
Central	-2.3%	Cape Town	2.5%	2.2%
Eastern	6.0%	Oostenberg, Helderberg	3.0-4.5%	3.4%
Khayalitsha	5.0%	Tygerberg, Oostenberg	3.0-3.5%	2.9%
Klipfontein	0.7%	Tygerberg?, Cape Town	2.5-3.0%	2.2%
Mitchell's Plain	3.4%	Tygerberg	3.4%	2.9%
Northern Panorama	2.9%	Blaauberg	7.7%	6.0%
Southern	1.1%	Southern Peninsula	3.1%	2.6%
Tygerberg	0.7%	Tygerberg	3.4%	2.8%

Table 8: Health district population growth rates, 1996-2001

The results of these calculations are shown graphically in Figure 14. A comparison of the high, middle and low projections appears in Appendix 6.

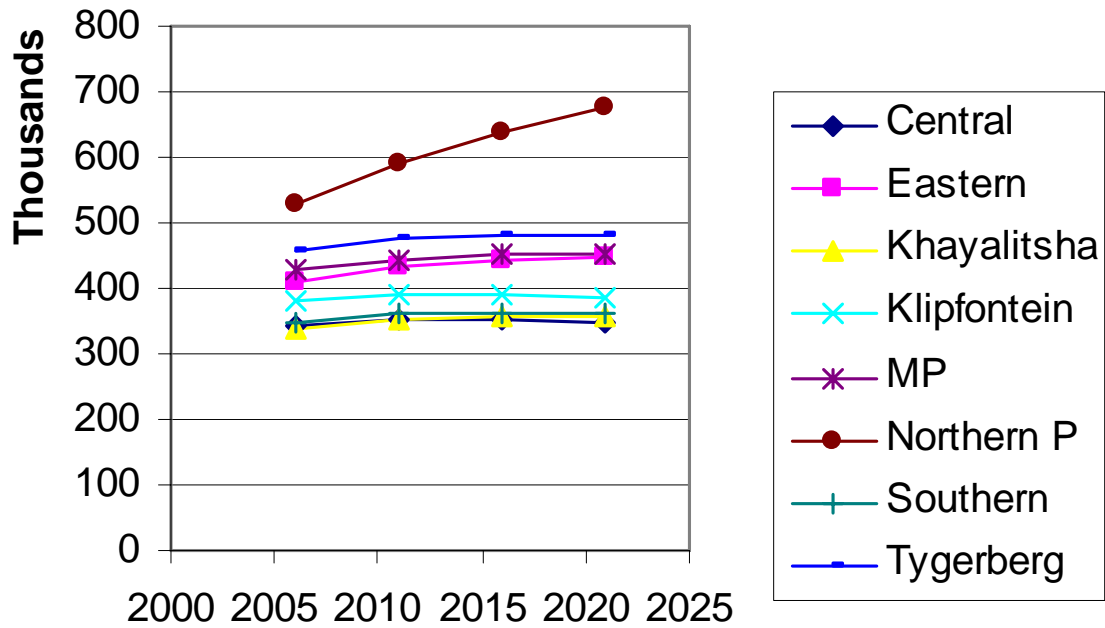


Figure 14: Projections of the health districts

It is important to note that the above is a simple model which extrapolates the trend between 1996 and 2001 on the assumption that the rate of change in the various proportions will disappear over a suitably long period (60 years was chosen in this case). Where people will actually live in future depends on the complex interaction of a number of factors, not least of which is town and regional development. Thus the major use of these numbers is to give some idea of the "pressure points" for development.

CHAPTER 4 IMPLICATIONS OF THE PROJECTIONS

The population in the City is expected to grow by nearly 17% over the 15 year projection period. By the end of the period the black African population is expected to about 75% of the Coloured population which will be approximately 47% of the total population of the City.

Northern Panarama will continue to remain by far the largest health district, followed by Tygerberg with a population of about 71% of the size by 2021. The smallest health district by 2021 is expected to be the Central district with a population of about half the size of that of the Northern Panarama.

1. Number and size of households

The average household size in future is very much dependent on the number of houses that are built. Table 9 summarises two possible scenarios:

- (a) assuming that the proportion of the population by age and sex who are heads of households remains the same over the years, and
- (b) assuming that the average household size per head of household by age and sex remains the same over the years.

In both cases it is further assumed that by the year 2021 five percent of the population would be staying in institutions⁴.

	1991	1996	2001	2021 (a)	2021 (b)
Asian	-	4.1	4.0	3.1	4.1
Black	3.2	3.6	3.6	3.0	3.9
Coloured	3.9	4.4	4.3	3.6	4.5
White	2.7	2.7	2.6	2.3	2.6
Total	3.7	3.6	3.6	3.2	3.9
No. of houses	-	681 000	760 000	1 057 000	864 000

Table 9: Average household size and number of houses in the City

Thus under scenario (a) there would be a doubling of the number of houses over the 35-year period while the average household size would fall by between 15% and 25%. Under scenario (b) the average household size remains largely unchanged but the number of households increases by some 57% over the 35-year period.

The number of households under each scenario by health district is shown in Table 10.

⁴ In 1996 an average of about 2% of the population appear to be staying in institutions with a high of about 4% for the White population.

Scenario		2001*	% increase	
(a)	(b)		(a)	(b)
114 000	95 000	89 000	28%	7%
130 000	106 000	104 000	25%	2%
122 000	95 000	98 000	24%	-3%
114 000	91 000	88 000	30%	3%
123 000	98 000	69 000	78%	42%
218 000	184 000	129 000	69%	43%
102 000	84 000	80 000	28%	5%
134 000	111 000	103 000	30%	8%

* (approx.) dist. adjusted for the undercount but total kept as per census

Table 10: The number of households in 2021 by health district

2. HIV/AIDS

As was mentioned earlier the projections were carried out using the ASSA2003 model adapted to model the epidemic in the Western Cape. This model is hugely more sophisticated than the adaptation of the ASSA600 model used to allow for the impact of HIV/AIDS on the projections used in the previous projection. Apart from calibrating the model to fit the epidemic to each population group it allows for the impact of interventions on the epidemic.

2.1 Deaths

By the year 2013 deaths due to AIDS in the City are expected to be about half the number of deaths from all other causes. Figure 15 illustrates the impact of the epidemic on the expected number of deaths in future.

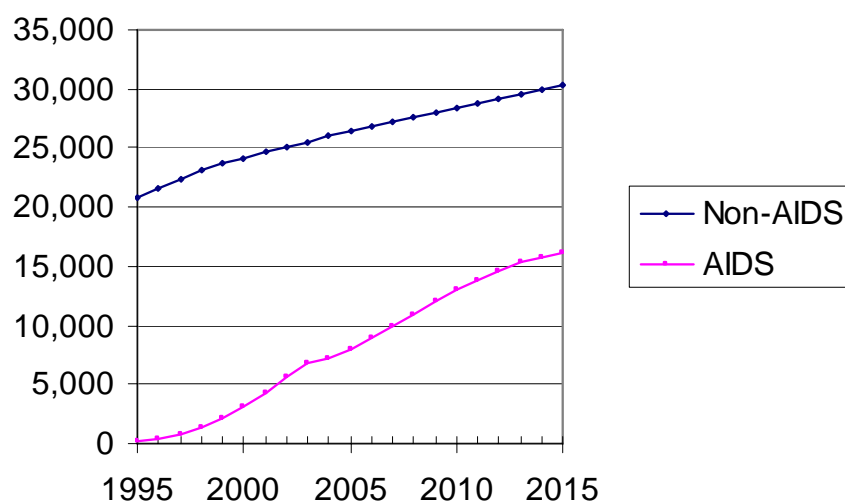


Figure 15: The number of deaths due to AIDS compared to those due to other causes.

2.2 Life Expectancy

Figure 16 illustrates the impact of the epidemic on life expectancies at birth on the two groups which are generally expected to suffer the biggest impact. Over the next 10 years the life expectancy at birth of the Coloured population is expected to remain fairly constant with that for females falling slightly while that of male could increase slightly. However, over the same period the life expectancy at birth of the African population group is expected to fall by some 10 to 15 years.

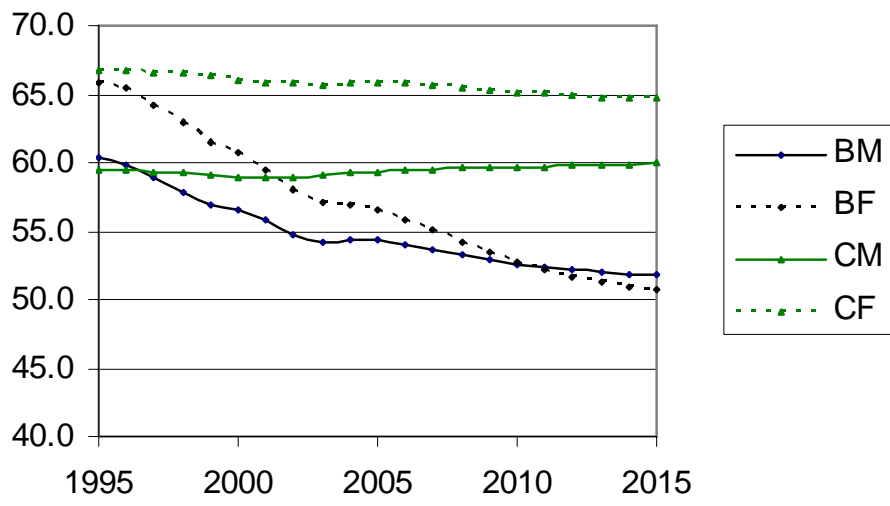


Figure 16: Life expectancy at birth for Black and Coloured males and females.

2.3 Population pyramids

Finally the impact of HIV on the population as a whole is illustrated by the difference in the population pyramids in 2021 (Figure 17).

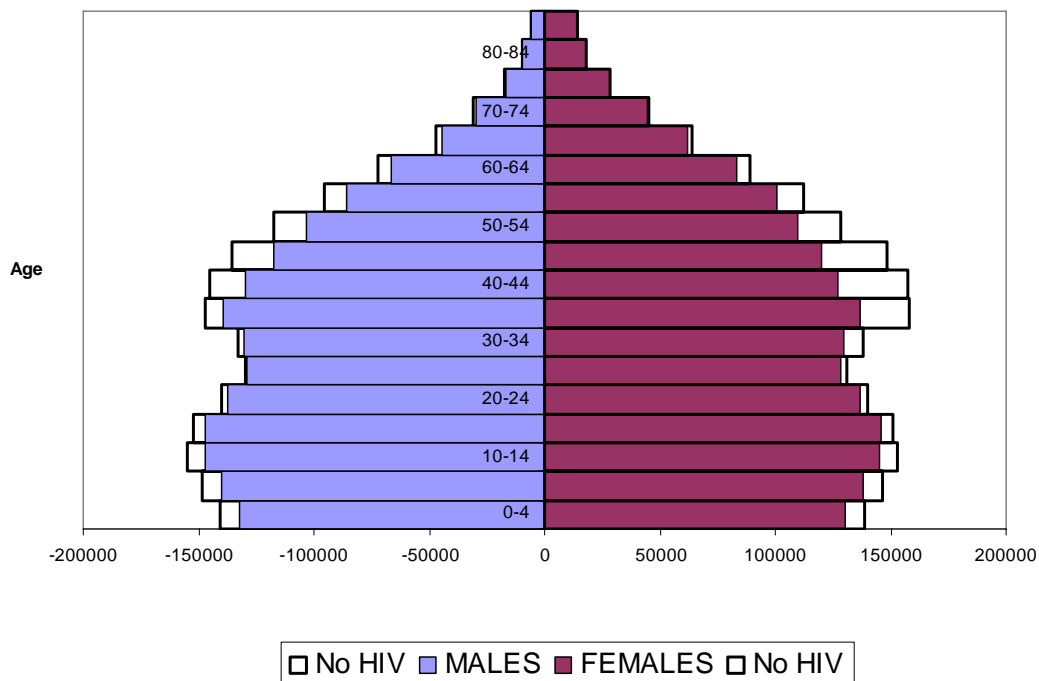


Figure 17: Population pyramids with and without HIV, 2021

As can be seen from these pyramids the impact is mainly in the working and very young age-groups with perhaps a greater (and younger) impact among females.

APPENDIX 1: POPULATION ACCORDING TO CENSUS 2001

AGE	CENTRAL		EASTERN		KHAYALITSHA		KLIPFONTEIN	
	MALE	FEM	MALE	FEM	MALE	FEM	MALE	FEM
0-4	8 824	8 573	19 430	19 184	16 901	16 609	15 139	14 820
5-9	8 543	8 531	19 843	19 506	15 578	16 060	15 528	15 354
10-14	9 329	9 103	20 069	19 835	15 431	16 733	16 250	16 673
15-19	11 717	12 598	19 198	20 205	16 605	20 069	16 906	18 383
20-24	15 698	16 116	17 011	18 250	19 138	21 824	16 173	18 141
25-29	14 200	14 597	17 138	18 400	19 671	21 514	15 773	16 926
30-34	11 749	12 189	17 003	18 419	15 113	16 145	13 472	14 692
35-39	9 940	11 164	17 025	18 542	12 986	13 737	12 132	13 896
40-44	8 855	10 536	13 947	14 881	9 631	10 516	9 848	11 728
45-49	7 243	9 173	9 424	10 310	6 727	7 035	7 738	9 770
50-54	7 213	8 463	6 804	7 346	4 469	4 120	6 539	8 086
55-59	5 710	6 930	4 818	5 289	2 481	2 513	5 111	6 195
60-64	4 814	5 902	3 929	4 490	1 713	1 929	4 191	5 748
65-69	3 708	5 062	2 760	3 276	763	990	3 054	4 701
70-74	3 304	4 660	1 936	2 862	467	542	2 034	3 398
75-79	2 229	3 828	1 294	2 072	237	273	1 321	2 054
80-84	1 854	2 735	788	1 393	162	167	588	1 166
85+	841	2 487	363	983	45	105	233	708
	135 771	152 647	192 780	205 243	158 118	170 881	162 030	182 439
TOTAL	288 418		398 023		328 999		344 469	

AGE	MITCHELL'S PLAIN		NORTHERN PANORAMA		SOUTHERN		TYGERBERG	
	MALE	FEM	MALE	FEM	MALE	FEM	MALE	FEM
0-4	20 272	20 088	17 802	16 943	13 067	12 674	16 316	16 110
5-9	19 384	19 929	17 287	17 034	13 553	13 339	17 415	17 265
10-14	20 061	20 759	17 354	17 460	14 015	14 007	18 434	18 557
15-19	21 388	23 790	18 084	18 874	15 226	14 006	19 674	20 467
20-24	21 366	23 426	18 476	18 726	14 465	13 133	18 257	20 149
25-29	20 716	20 828	20 052	20 503	14 082	13 366	16 699	17 488
30-34	16 065	16 492	19 462	20 691	13 638	13 692	15 326	17 464
35-39	14 389	15 354	17 669	18 633	12 785	13 384	14 689	16 771
40-44	12 034	14 317	15 610	16 739	10 684	11 648	12 792	14 692
45-49	9 747	11 220	11 760	12 788	7 800	8 864	9 962	12 052
50-54	7 436	7 969	9 520	10 168	6 635	7 555	8 483	10 355
55-59	4 567	4 964	7 003	7 665	5 102	5 978	6 370	7 838
60-64	3 006	3 661	5 391	6 222	4 379	5 129	5 304	7 108
65-69	1 618	2 175	3 707	4 446	3 033	3 977	4 007	5 790
70-74	939	1 274	2 580	3 380	2 135	3 127	2 624	4 284
75-79	354	677	1 612	2 348	1 335	1 929	1 518	2 691
80-84	162	368	765	1 279	655	1 211	769	1 609
85+	66	231	314	899	303	892	327	1 230
	193 570	207 522	204 448	214 798	152 892	157 911	188 966	211 920
TOTAL	401 092		419 246		310 803		400 886	

CITY OF CAPE TOWN	AFRICAN		COLOURED		INDIAN		WHITE		TOTAL	
	MALE	FEM	MALE	FEM	MALE	FEM	MALE	FEM	MALE	FEM
0-4	46 466	45 648	64 782	63 788	1 744	1 548	14 773	14 077	127 765	125 061
5-9	40 870	42 467	68 661	67 493	1 788	1 714	15 763	15 274	127 082	126 948
10-14	38 014	41 502	73 198	72 736	2 024	1 911	17 669	17 112	130 905	133 260
15-19	43 267	52 333	73 225	74 435	1 990	2 076	20 226	19 802	138 707	148 646
20-24	58 553	64 656	59 963	63 309	2 080	2 107	20 123	19 848	140 719	149 919
25-29	62 191	61 744	54 890	58 991	1 762	1 890	19 664	20 856	138 507	143 482
30-34	45 713	43 731	53 160	60 877	1 676	1 754	21 411	23 525	121 961	129 887
35-39	36 093	35 581	53 273	61 873	1 608	1 677	20 766	22 498	111 740	121 630
40-44	25 484	26 867	45 698	53 865	1 565	1 586	20 774	22 785	93 521	105 103
45-49	17 851	18 989	33 955	41 451	1 238	1 324	17 470	19 413	70 514	81 176
50-54	12 869	12 465	26 681	32 611	1 046	1 060	16 568	17 825	57 164	63 962
55-59	7 750	8 104	18 811	23 034	691	670	14 050	15 511	41 302	47 319
60-64	5 716	6 177	14 672	19 808	480	578	11 763	13 606	32 631	40 168
65-69	2 883	3 642	10 259	14 962	382	425	9 088	11 407	22 612	30 435
70-74	1 935	2 401	6 200	10 040	221	281	7 769	10 835	16 125	23 556
75-79	1 174	1 319	2 966	5 814	134	205	5 479	8 716	9 753	16 054
80-84	655	774	1 327	3 082	58	111	3 644	5 990	5 684	9 957
85+	219	417	582	2 186	21	67	1 728	4 773	2 550	7 443
	447 704	468 817	662 301	730 355	20 508	20 982	258 728	283 852	1 389 241	1 504 006
	916 520		1 392 656		41 490		542 580		2 893 247	

The numbers for the health districts do not sum to those for the City exactly because the numbers for the health districts needed to be approximated from the numbers by Enumeration Area (EA) where the boundaries of health districts passed through EAs.

APPENDIX 2: DEMOGRAPHIC ASSUMPTIONS

Projections were carried out using a variation of the ASSA2003 AIDS and Demographic model (Actuarial Society of South Africa, 2005) which projects the population by individual ages and by individual years. The tables below are average fertility and survival rates extracted from the variation of the model used for this project to give an idea of the bases assumed.

FERTILITY (Age specific and total fertility rates):

African:

	2001-2006	2006-2011	2011-2016	2016-2021
15-19	0.045	0.041	0.038	0.036
20-24	0.088	0.086	0.084	0.081
25-29	0.109	0.110	0.111	0.112
30-34	0.093	0.094	0.093	0.094
35-39	0.056	0.050	0.046	0.043
40-44	0.023	0.019	0.017	0.015
45-49	0.006	0.004	0.003	0.003
TFR	2.090	2.013	1.946	1.904

Coloured:

	2001-2006	2006-2011	2011-2016	2016-2021
15-19	0.054	0.050	0.047	0.044
20-24	0.105	0.101	0.097	0.094
25-29	0.114	0.114	0.114	0.114
30-34	0.092	0.097	0.098	0.099
35-39	0.045	0.044	0.043	0.043
40-44	0.015	0.014	0.014	0.014
45-49	0.003	0.003	0.003	0.003
TFR	2.127	2.107	2.072	2.038

Indian:

	2001-2006	2006-2011	2011-2016	2016-2021
15-19	0.024	0.025	0.026	0.027
20-24	0.100	0.104	0.107	0.109
25-29	0.128	0.115	0.106	0.101
30-34	0.070	0.055	0.050	0.047
35-39	0.031	0.026	0.024	0.022
40-44	0.008	0.006	0.005	0.004
45-49	0.001	0.000	0.000	0.000
TFR	1.792	1.644	1.578	1.550

White:

	2001-2006	2006-2011	2011-2016	2016-2021
15-19	0.011	0.012	0.013	0.014
20-24	0.062	0.069	0.075	0.081
25-29	0.099	0.099	0.098	0.098
30-34	0.062	0.051	0.047	0.045
35-39	0.024	0.021	0.019	0.018
40-44	0.005	0.004	0.003	0.003
45-49	0.001	0.000	0.000	0.000
TFR	1.318	1.274	1.274	1.293

MORTALITY (five-year survival factors and life expectancy):

African:

	2001-2006		2006-2011		2011-2016		2016-2021	
	Male	Female	Male	Female	Male	Female	Male	Female
PB	0.9543	0.9578	0.9587	0.9619	0.9600	0.9629	0.9614	0.9641
0-4	0.9842	0.9856	0.9815	0.9829	0.9790	0.9802	0.9784	0.9796
5-9	0.9963	0.9973	0.9899	0.9909	0.9839	0.9849	0.9815	0.9824
10-14	0.9953	0.9966	0.9949	0.9964	0.9920	0.9935	0.9895	0.9911
15-19	0.9883	0.9882	0.9886	0.9888	0.9889	0.9892	0.9883	0.9887
20-24	0.9733	0.9590	0.9760	0.9575	0.9767	0.9550	0.9772	0.9554
25-29	0.9509	0.9356	0.9469	0.9124	0.9492	0.8988	0.9495	0.8966
30-34	0.9303	0.9341	0.9195	0.9035	0.9100	0.8731	0.9117	0.8645
35-39	0.9174	0.9370	0.9035	0.9084	0.8913	0.8814	0.8875	0.8707
40-44	0.9089	0.9435	0.8946	0.9176	0.8834	0.8944	0.8815	0.8877
45-49	0.8991	0.9461	0.8842	0.9294	0.8755	0.9088	0.8756	0.9038
50-54	0.8824	0.9333	0.8687	0.9282	0.8613	0.9155	0.8646	0.9106
55-59	0.8601	0.9049	0.8495	0.9087	0.8418	0.9064	0.8467	0.9041
60-64	0.8194	0.8650	0.8113	0.8712	0.8048	0.8776	0.8091	0.8813
65-69	0.7356	0.7953	0.7417	0.8097	0.7322	0.8146	0.7316	0.8229
70-74	0.6363	0.7063	0.6318	0.7080	0.6372	0.7182	0.6288	0.7167
75-79	0.5147	0.5883	0.5130	0.5886	0.5079	0.5851	0.5162	0.5916
80+	0.3505	0.4037	0.3388	0.3949	0.3371	0.4048	0.3231	0.3997
e ₀	54.8	58.0	53.9	55.5	52.6	52.4	52.5	51.6

Coloured:

	2001-2006		2006-2011		2011-2016		2016-2021	
	Male	Female	Male	Female	Male	Female	Male	Female
PB	0.9649	0.9690	0.9721	0.9754	0.9771	0.9798	0.9810	0.9832
0-4	0.9907	0.9927	0.9912	0.9931	0.9913	0.9930	0.9919	0.9934
5-9	0.9971	0.9977	0.9964	0.9970	0.9950	0.9957	0.9940	0.9948
10-14	0.9928	0.9964	0.9930	0.9966	0.9929	0.9964	0.9925	0.9959
15-19	0.9826	0.9932	0.9832	0.9936	0.9838	0.9940	0.9842	0.9942
20-24	0.9740	0.9875	0.9746	0.9868	0.9752	0.9866	0.9759	0.9869
25-29	0.9689	0.9808	0.9689	0.9764	0.9691	0.9725	0.9699	0.9716
30-34	0.9623	0.9743	0.9609	0.9677	0.9597	0.9602	0.9600	0.9576
35-39	0.9509	0.9646	0.9491	0.9574	0.9469	0.9492	0.9465	0.9469
40-44	0.9360	0.9544	0.9349	0.9471	0.9336	0.9388	0.9337	0.9371
45-49	0.9135	0.9432	0.9128	0.9380	0.9126	0.9308	0.9136	0.9292
50-54	0.8834	0.9275	0.8830	0.9262	0.8829	0.9222	0.8845	0.9211
55-59	0.8464	0.9029	0.8476	0.9038	0.8488	0.9026	0.8518	0.9024
60-64	0.7972	0.8729	0.8016	0.8769	0.8035	0.8787	0.8072	0.8808
65-69	0.7370	0.8268	0.7427	0.8338	0.7483	0.8413	0.7520	0.8467
70-74	0.6685	0.7637	0.6731	0.7732	0.6794	0.7817	0.6862	0.7910
75-79	0.6111	0.7054	0.6150	0.7140	0.6168	0.7206	0.6199	0.7264
80+	0.4707	0.5072	0.4726	0.5137	0.4739	0.5168	0.4724	0.5194
e ₀	59.0	65.7	59.6	65.6	59.8	64.8	60.2	64.8

Indian:

	2001-2006		2006-2011		2011-2016		2016-2021	
	Male	Female	Male	Female	Male	Female	Male	Female
PB	0.9856	0.9878	0.9865	0.9884	0.9873	0.9890	0.9884	0.9899
0-4	0.9959	0.9963	0.9953	0.9957	0.9943	0.9946	0.9940	0.9943
5-9	0.9985	0.9982	0.9981	0.9979	0.9968	0.9966	0.9955	0.9954
10-14	0.9952	0.9973	0.9954	0.9977	0.9953	0.9977	0.9948	0.9973
15-19	0.9887	0.9958	0.9886	0.9963	0.9884	0.9967	0.9880	0.9969
20-24	0.9851	0.9939	0.9845	0.9934	0.9840	0.9932	0.9835	0.9934
25-29	0.9839	0.9902	0.9832	0.9866	0.9827	0.9825	0.9828	0.9814
30-34	0.9779	0.9862	0.9755	0.9788	0.9728	0.9695	0.9718	0.9647
35-39	0.9649	0.9814	0.9614	0.9725	0.9569	0.9604	0.9547	0.9543
40-44	0.9502	0.9754	0.9471	0.9682	0.9433	0.9563	0.9418	0.9506
45-49	0.9312	0.9647	0.9288	0.9620	0.9262	0.9536	0.9262	0.9492
50-54	0.8987	0.9417	0.8977	0.9441	0.8956	0.9417	0.8972	0.9401
55-59	0.8563	0.9080	0.8603	0.9164	0.8614	0.9204	0.8651	0.9233
60-64	0.8020	0.8612	0.8099	0.8764	0.8143	0.8870	0.8184	0.8947
65-69	0.7383	0.8059	0.7479	0.8274	0.7570	0.8459	0.7639	0.8602
70-74	0.6736	0.7466	0.6843	0.7714	0.6947	0.7932	0.7051	0.8131
75-79	0.5997	0.6754	0.6111	0.7002	0.6195	0.7176	0.6277	0.7331
80+	0.4952	0.5468	0.4893	0.5435	0.4759	0.5375	0.4882	0.5686
e ₀	63.8	69.9	63.7	69.9	63.3	68.8	63.3	68.5

White:

	2001-2006		2006-2011		2011-2016		2016-2021	
	Male	Female	Male	Female	Male	Female	Male	Female
PB	0.9898	0.9922	0.9905	0.9925	0.9909	0.9927	0.9914	0.9930
0-4	0.9960	0.9970	0.9952	0.9961	0.9943	0.9953	0.9942	0.9951
5-9	0.9984	0.9988	0.9980	0.9983	0.9968	0.9971	0.9959	0.9963
10-14	0.9954	0.9979	0.9956	0.9980	0.9955	0.9978	0.9950	0.9973
15-19	0.9894	0.9966	0.9899	0.9968	0.9902	0.9969	0.9904	0.9970
20-24	0.9870	0.9951	0.9871	0.9950	0.9871	0.9949	0.9871	0.9949
25-29	0.9871	0.9923	0.9868	0.9900	0.9865	0.9880	0.9864	0.9874
30-34	0.9849	0.9891	0.9841	0.9836	0.9832	0.9775	0.9829	0.9750
35-39	0.9801	0.9857	0.9795	0.9791	0.9777	0.9697	0.9769	0.9652
40-44	0.9719	0.9808	0.9714	0.9749	0.9699	0.9657	0.9685	0.9605
45-49	0.9574	0.9738	0.9577	0.9702	0.9566	0.9629	0.9560	0.9584
50-54	0.9331	0.9631	0.9344	0.9628	0.9348	0.9583	0.9349	0.9548
55-59	0.8983	0.9442	0.8999	0.9444	0.9015	0.9433	0.9035	0.9407
60-64	0.8515	0.9175	0.8557	0.9193	0.8582	0.9196	0.8620	0.9202
65-69	0.7904	0.8809	0.7981	0.8862	0.8039	0.8891	0.8081	0.8906
70-74	0.7067	0.8210	0.7147	0.8259	0.7229	0.8334	0.7291	0.8378
75-79	0.6133	0.7314	0.6212	0.7384	0.6279	0.7430	0.6352	0.7514
80+	0.4032	0.4852	0.3980	0.4847	0.4000	0.4904	0.4028	0.4845
e ₀	68.0	74.4	68.2	73.7	68.0	72.4	68.1	71.7

APPENDIX 3: ESTIMATE OF THE POPULATION AS AT OCTOBER 2001

Health District	Total
CENTRAL	326 373
EASTERN	378 060
KHAYALITSHA	315 769
KLIPFONTEIN	361 782
MITCHELL'S PLAIN	400 145
NORTHERN PANORAMA	458 178
SOUTHERN	326 895
TYGERBERG	427 577

CITY OF CAPE TOWN	AFRICAN		COLOURED		INDIAN		WHITE		TOTAL	
	MALE	FEM	MALE	FEM	MALE	FEM	MALE	FEM	MALE	FEM
AGE										
0-4	55,578	55,235	68,557	67,508	1,854	1,817	17,072	16,340	143,062	140,900
5-9	41,712	41,058	69,158	67,945	1,861	1,836	17,555	16,852	130,287	127,690
10-14	39,501	40,072	71,490	70,422	1,937	1,889	19,653	18,998	132,580	131,380
15-19	48,547	49,491	73,301	74,524	2,132	2,190	21,310	20,797	145,290	147,002
20-24	59,330	61,436	62,943	64,269	2,229	2,275	20,722	20,841	145,224	148,822
25-29	62,888	63,202	61,296	62,183	2,043	2,041	18,741	21,906	144,967	149,332
30-34	49,273	47,191	58,156	62,332	1,887	1,893	23,344	24,714	132,660	136,129
35-39	37,951	37,279	55,575	61,977	1,742	1,811	21,457	23,674	116,724	124,740
40-44	25,736	27,110	46,477	53,066	1,680	1,711	23,294	23,952	97,187	105,839
45-49	18,131	19,190	34,443	41,311	1,430	1,429	19,126	20,467	73,130	82,397
50-54	13,097	12,808	25,891	32,489	1,088	1,143	17,880	18,770	57,956	65,210
55-59	7,898	8,319	18,682	22,858	664	722	14,895	16,327	42,139	48,226
60-64	5,978	6,522	14,697	19,445	535	622	12,815	14,314	34,026	40,903
65-69	3,070	3,854	10,132	15,213	418	457	9,766	11,959	23,386	31,483
70-74	2,103	2,572	6,206	10,014	290	301	8,181	11,372	16,780	24,259
75-79	1,265	1,405	3,262	5,974	201	219	5,912	9,151	10,640	16,749
80-84	768	909	1,551	3,185	80	119	3,475	6,242	5,873	10,455
85+	294	553	879	2,477	28	70	2,034	5,012	3,235	8,113
	473,122	478,205	682,695	737,194	22,098	22,544	277,233	301,687	1,455,149	1,539,630
	951,327		1,419,889		44,642		578,921		2,994,779	

APPENDIX 4: MIGRATION IMPLIED BY THE 1996 AND 2001 POPULATION ESTIMATES

INDIAN

AGE	Net migration to City		Average rate p.a.	
	MALE	FEM	MALE	FEM
0	-107	-91	-1.1%	-1.0%
5	-70	-42	-0.7%	-0.4%
10	91	96	0.9%	1.0%
15	168	163	1.6%	1.5%
20	258	243	2.6%	2.4%
25	168	96	1.8%	1.0%
30	96	68	1.1%	0.8%
35	118	112	1.4%	1.3%
40	98	61	1.3%	0.8%
45	22	10	0.3%	0.2%
50	-23	12	-0.5%	0.3%
55	-19	9	-0.6%	0.3%
60	22	17	0.9%	0.6%
65	46	0	2.4%	0.0%
70	24	16	1.6%	1.1%
75	5	1	0.6%	0.1%
80	-6	2	-1.7%	0.3%
85+	-4	3	-8.3%	1.6%
	888	776	0.8%	0.7%

AFRICAN

AGE	Net migration to City		Average rate p.a.	
	MALE	FEM	MALE	FEM
0	1345	1366	0.6%	0.6%
5	4100	4216	2.2%	2.3%
10	3024	3919	1.5%	1.9%
15	8289	10345	3.5%	4.4%
20	25617	27521	10.6%	11.1%
25	19305	18165	7.9%	7.5%
30	5619	4652	2.7%	2.3%
35	1996	1754	1.3%	1.1%
40	1431	1343	1.4%	1.2%
45	792	780	1.0%	1.0%
50	343	380	0.7%	0.8%
55	101	238	0.3%	0.6%
60	-49	104	-0.2%	0.4%
65	-93	35	-0.7%	0.2%
70	-35	33	-0.3%	0.3%
75	24	28	0.3%	0.4%
80	14	24	0.4%	0.5%
85+	6	16	0.6%	0.6%
	71829	74918	3.5%	3.7%

COLOURED

AGE	Net migration to City		Average rate p.a.	
	MALE	FEM	MALE	FEM
0	-1903	-1766	-0.5%	-0.5%
5	-3202	-2924	-0.9%	-0.8%
10	-711	-552	-0.2%	-0.2%
15	660	815	0.2%	0.2%
20	840	950	0.3%	0.3%
25	801	758	0.3%	0.2%
30	736	612	0.3%	0.2%
35	522	524	0.2%	0.2%
40	361	396	0.2%	0.2%
45	245	247	0.2%	0.1%
50	172	166	0.2%	0.1%
55	109	120	0.1%	0.1%
60	79	91	0.1%	0.1%
65	70	64	0.2%	0.1%
70	38	58	0.1%	0.1%
75	20	34	0.1%	0.1%
80	20	25	0.3%	0.2%
85+	15	18	0.4%	0.2%
	-1128	-364	0.0%	0.0%

* They out-migration of children is a result of the methodology used and is more likely to be accounted for by a small reduction in the fertility rate.

WHITE

AGE	Net migration to City		Average rate p.a.	
	MALE	FEM	MALE	FEM
0	-1903	-4502	-2.0%	-4.9%
5	-3202	-1478	-3.3%	-1.6%
10	-711	891	-0.7%	0.9%
15	660	1683	0.6%	1.7%
20	840	-281	0.8%	-0.3%
25	801	-1332	0.7%	-1.1%
30	736	726	0.7%	0.6%
35	522	1426	0.5%	1.2%
40	361	1356	0.4%	1.3%
45	245	1077	0.3%	1.1%
50	172	1079	0.2%	1.3%
55	109	1318	0.2%	1.8%
60	79	1397	0.1%	2.2%
65	70	928	0.1%	1.5%
70	38	470	0.1%	0.8%
75	20	287	0.1%	0.7%
80	20	107	0.1%	0.4%
85+	15	64	0.2%	0.3%
	-1128	-364	-0.1%	0.0%

APPENDIX 5: PROJECTIONS ON THE BASIS OF THE MIDDLE MIGRATION ASSUMPTION

AFRICAN

AGE	2006		2011		2016		2021	
	Males	Females	Males	Females	Males	Females	Males	Females
0-4	66,910	66,473	65,286	64,844	56,640	56,243	50,117	49,755
5-9	56,033	55,873	66,218	65,915	64,086	63,746	55,498	55,177
10-14	44,004	43,541	56,434	56,383	65,457	65,241	62,920	62,653
15-19	42,123	43,595	44,923	44,809	56,409	56,536	64,890	64,807
20-24	57,369	59,328	44,739	46,471	45,448	45,423	56,072	56,243
25-29	70,576	71,365	59,950	60,272	44,940	45,427	44,812	43,773
30-34	65,839	64,227	68,823	66,218	57,384	54,082	42,854	40,670
35-39	47,515	45,466	60,944	58,137	62,636	57,288	52,085	46,262
40-44	35,813	35,858	43,286	41,594	54,260	51,043	55,306	49,262
45-49	24,036	26,225	32,308	33,166	38,357	37,286	47,657	45,050
50-54	16,631	18,521	21,412	24,546	28,391	30,241	33,603	33,692
55-59	11,683	12,166	14,512	17,312	18,503	22,543	24,577	27,575
60-64	6,795	7,656	9,916	11,137	12,221	15,743	15,680	20,412
65-69	4,821	5,673	5,468	6,707	7,953	9,798	9,873	13,889
70-74	2,230	3,100	3,529	4,597	3,988	5,486	5,807	8,079
75-79	1,340	1,836	1,427	2,221	2,240	3,295	2,515	3,950
80-84	661	841	695	1,090	744	1,318	1,153	1,942
85+	360	583	333	562	338	664	361	799
	554,738	562,325	600,202	605,983	619,994	621,403	625,779	623,990
Total	1,117,063		1,206,185		1,241,396		1,249,769	

COLOURED

AGE	2006		2011		2016		2021	
	Males	Females	Males	Females	Males	Females	Males	Females
0-4	68,284	67,251	70,152	69,019	70,325	69,139	68,709	67,514
5-9	66,814	65,985	67,212	66,342	69,350	68,353	69,680	68,611
10-14	68,653	67,514	66,429	65,657	66,811	65,995	68,905	67,967
15-19	71,229	70,457	68,312	67,437	66,029	65,498	66,346	65,760
20-24	72,353	74,404	70,205	70,204	67,288	67,127	65,027	65,161
25-29	61,655	63,825	70,696	73,601	68,557	69,350	65,704	66,281
30-34	59,718	61,283	59,908	62,466	68,593	71,638	66,526	67,406
35-39	56,236	60,976	57,536	59,442	57,572	60,056	65,870	68,608
40-44	53,038	59,990	53,484	58,490	54,556	56,514	54,522	56,895
45-49	43,642	50,792	49,665	56,893	49,993	54,981	50,975	53,006
50-54	31,568	39,066	39,896	47,698	45,370	53,006	45,695	51,119
55-59	22,948	30,214	27,921	36,230	35,257	44,021	40,147	48,841
60-64	15,857	20,694	19,485	27,346	23,723	32,729	30,043	39,740
65-69	11,761	17,020	12,735	18,173	15,677	24,050	19,162	28,839
70-74	7,501	12,619	8,759	14,219	9,539	15,298	11,799	20,374
75-79	4,160	7,671	5,061	9,778	5,959	11,129	6,546	12,103
80-84	2,006	4,233	2,566	5,484	3,129	7,058	3,699	8,092
85+	1,151	2,876	1,498	3,660	1,930	4,732	2,391	6,123
	718,575	776,870	751,521	812,139	779,658	840,674	801,746	862,441
Total	1,495,445		1,563,661		1,620,331		1,664,187	

INDIAN

AGE	2006		2011		2016		2021	
	Males	Females	Males	Females	Males	Females	Males	Females
0-4	1,750	1,705	1,714	1,669	1,610	1,566	1,508	1,466
5-9	1,785	1,766	1,702	1,668	1,680	1,640	1,587	1,547
10-14	1,901	1,882	1,809	1,795	1,713	1,682	1,681	1,643
15-19	2,002	1,955	1,941	1,925	1,830	1,819	1,720	1,692
20-24	2,230	2,301	2,054	2,022	1,961	1,961	1,829	1,834
25-29	2,314	2,355	2,268	2,345	2,064	2,042	1,950	1,965
30-34	2,079	2,060	2,320	2,349	2,256	2,319	2,042	2,011
35-39	1,909	1,926	2,070	2,055	2,281	2,299	2,204	2,245
40-44	1,748	1,831	1,879	1,909	2,007	1,995	2,189	2,200
45-49	1,631	1,687	1,679	1,785	1,788	1,834	1,897	1,900
50-54	1,326	1,386	1,511	1,629	1,553	1,707	1,654	1,743
55-59	962	1,084	1,178	1,314	1,346	1,538	1,388	1,607
60-64	571	666	829	1,001	1,016	1,215	1,165	1,423
65-69	453	540	479	587	686	890	839	1,089
70-74	329	374	354	451	373	500	530	767
75-79	202	230	230	293	249	361	265	408
80-84	119	147	122	160	142	210	156	264
85+	50	105	81	138	96	163	114	207
	23,361	24,000	24,222	25,094	24,651	25,740	24,718	26,012
Total	47,361		49,315		50,390		50,730	

WHITE

AGE	2006		2011		2016		2021	
	Males	Females	Males	Females	Males	Females	Males	Females
0-4	15,109	14,500	14,092	13,553	13,342	12,841	12,009	11,562
5-9	14,560	13,851	14,006	13,415	13,583	13,060	13,092	12,607
10-14	16,915	16,172	14,231	13,510	13,814	13,224	13,459	12,940
15-19	20,374	19,857	17,241	16,577	14,361	13,687	13,833	13,279
20-24	20,948	21,248	20,109	20,053	17,047	16,653	14,215	13,706
25-29	18,691	19,951	19,892	20,744	19,507	19,755	16,685	16,478
30-34	17,800	21,531	18,123	19,642	19,478	20,427	19,177	19,465
35-39	23,772	25,285	17,906	21,571	18,010	19,383	19,231	19,979
40-44	21,800	24,258	23,663	25,165	17,685	21,077	17,680	18,775
45-49	23,329	24,309	21,529	24,041	23,105	24,427	17,190	20,268
50-54	18,940	20,640	22,669	23,948	20,755	23,305	22,138	23,420
55-59	17,470	18,885	18,094	20,277	21,381	23,145	19,486	22,319
60-64	14,288	16,332	16,177	18,294	16,529	19,344	19,411	21,870
65-69	11,712	13,900	12,626	15,405	14,086	17,021	14,340	17,889
70-74	8,227	10,979	9,615	12,554	10,286	13,822	11,458	15,232
75-79	6,016	9,579	6,024	9,227	7,026	10,539	7,536	11,620
80-84	3,809	6,830	3,842	7,152	3,848	6,919	4,493	7,937
85+	2,404	5,632	2,625	6,265	2,678	6,754	2,696	6,874
	276,163	303,736	272,464	301,391	266,522	295,385	258,128	286,219
Total	579,900		573,856		561,906		544,348	

TOTAL CITY POPULATION

AGE	2006		2011		2016		2021	
	Males	Females	Males	Females	Males	Females	Males	Females
0-4	152,054	149,929	151,245	149,085	141,916	139,789	132,343	130,297
5-9	139,191	137,475	149,137	147,340	148,699	146,799	139,857	137,941
10-14	131,472	129,109	138,904	137,345	147,795	146,141	146,964	145,202
15-19	135,728	135,863	132,418	130,748	138,630	137,540	146,789	145,539
20-24	152,901	157,281	137,107	138,750	131,744	131,163	137,143	136,944
25-29	153,236	157,497	152,807	156,963	135,066	136,574	129,152	128,497
30-34	145,437	149,101	149,175	150,675	147,710	148,466	130,599	129,552
35-39	129,431	133,653	138,455	141,205	140,499	139,026	139,390	137,094
40-44	112,399	121,936	122,311	127,158	128,508	130,629	129,697	127,132
45-49	92,637	103,013	105,182	115,884	113,243	118,528	117,719	120,223
50-54	68,464	79,613	85,488	97,821	96,069	108,258	103,089	109,974
55-59	53,063	62,348	61,705	75,133	76,487	91,248	85,598	100,341
60-64	37,511	45,347	46,406	57,778	53,490	69,030	66,299	83,446
65-69	28,749	37,132	31,309	40,871	38,402	51,760	44,214	61,705
70-74	18,286	27,071	22,256	31,820	24,186	35,106	29,595	44,453
75-79	11,717	19,314	12,742	21,519	15,474	25,324	16,862	28,082
80-84	6,594	12,051	7,225	13,886	7,862	15,505	9,500	18,235
85+	3,966	9,196	4,537	10,625	5,043	12,313	5,562	14,003
	1,572,837	1,666,931	1,648,409	1,744,607	1,690,824	1,783,200	1,710,371	1,798,662
Total	3,239,768		3,393,017		3,474,025		3,509,033	

APPENDIX 6: COMPARISON OF HIGH MIDDLE AND LOW PROJECTIONS

MIDDLE

	2006	2011	2016	2021
Asian	47,361	49,315	50,390	50,730
Black	1,117,063	1,206,185	1,241,396	1,249,769
Coloured	1,495,445	1,563,661	1,620,331	1,664,187
White	579,900	573,856	561,906	544,348
Total	3,239,768	3,393,017	3,474,025	3,509,033

HIGH

	2006	2011	2016	2021
Asian	48,079	51,201	53,786	55,840
Black	1,185,260	1,410,265	1,613,154	1,800,786
Coloured	1,493,191	1,559,570	1,614,300	1,655,132
White	577,742	570,758	559,011	543,462
Total	3,304,272	3,591,794	3,840,252	4,055,219

LOW

	2006	2011	2016	2021
Asian	46,902	48,293	48,810	48,664
Black	1,038,422	1,086,086	1,101,117	1,102,571
Coloured	1,495,244	1,562,352	1,617,835	1,661,048
White	579,900	573,856	561,906	544,348
Total	3,160,467	3,270,587	3,329,668	3,356,631

APPENDIX 7: PROJECT PROPOSAL

TERMS OF REFERENCE FOR UNDERTAKING THE POPULATION PROJECTION OF THE CITY OF CAPE TOWN AS A WHOLE

Objective

To produce a report estimating the current population in the City of Cape Town and projecting the population forward to the year 2021 in accordance with the project proposal attached.

The report is to include a description of the methods used as well as all assumptions made in deriving the estimates and a review of the accuracy of the previous (1999) projection.

Operation

1. In the first instance the consultant will be engaged to work on Phase 1 but in the light of this work may be retained to form part of the team to undertake Phase 2.
2. The City of Cape Town will provide a staff member from Strategic Information to work closely with the consultant in order to assist with the project and to gain an understanding of the projection process and its requirements.
3. The consultant will meet with the Steering Committee to ensure that the brief is clearly understood and that all needs are catered for.
4. In addition the consultant may need to meet with City officials from time to time to tap their expertise.

Time Frame

1. The report (1st phase) is to be completed within three months from the date of signing of the contract and receipt of the first instalment of payment. However, the consultant will report monthly on progress and the City reserves the right to cancel the appointment if progress is deemed to be unsatisfactory.

29 March 2004

PROJECT PROPOSAL

Population Projection of the City of Cape Town

Introduction

1. The need for an acceptable estimate of the current and future size and composition of the population of the City, over and above the analysis of data derived from the census, has been identified. This information is necessary to inform a wide range of planning initiatives presently being undertaken, or under discussion, in the City. The estimate of future population and its characteristics are crucial in determining:
 - The need and effective demand for housing and infrastructure development.
 - The need for health facilities.
 - The rate and growth of the supply of labour.
 - An assessment of need and resources.

Operation

There are two distinct, although interrelated, phases to the study. These are:

1. The initial projection of the population of the City of Cape Town subdivided by population group (African, Coloured, Indian and White), age and sex.
2. In addition to these totals past patterns as to the distribution of the population will be used to produce estimates by broad geographic subdivision (on the assumption that HIV prevalence data can be provided for these populations), socio-economic group and household size.

This project proposal is concerned with the first phase of the project.

Phase 1: Projection of the population for the City as a whole

The population for the City of Cape Town will be projected from the base year of 2001 to the year 2021 at five yearly intervals. The projected population will be divided by sex, and age in five-year age groups. Such a projection will take into account the possible impact of the HIV/AIDS epidemic.

In addition these numbers need to be distributed between the sub-regions giving some ideas as to household size and type. This will be based on an extrapolation of past trends taking into account any expected future developments in the area.

The projection will involve at least seven sub-projects as outlined in Annexure 1. As it is probable that the results of most of these projects (in particular AIDS, population distribution and socio-economic make up of the population, migration) will be improved if the data is analysed by population group (African, Coloured, Indian and White) separately, the projections will be carried out for each population group separately.

A model will be produced which could be used by planners to consider the impact of alternative scenarios, in particular the impact of interventions.

Phase 2: Spatial distribution of the population increase within the City

The population in each sub-district will be projected from the base year of 2001 to the year 2021 at five yearly intervals. The projected population will be divided by sex, and age in five-year age groups. Such projections will take into account the possible impact of the HIV/AIDS epidemic and extrapolations of past trends taking into account any expected future developments in the area.

The projection will involve at least two further sub-projects as outlined in Annexure 1. As it is probable that the results of most of these projects (in particular AIDS, population distribution and socio-economic make up of the population, migration) will be improved if the data is analysed by population group (African, Coloured, Indian and White) separately, the projections will be carried out for each population group separately.

Essentially this stage would involve examining the migration, particularly at the sub-district level derived in Phase 1 on the basis of past patterns to see if it is consistent with known development plans as well as capacities of certain areas.

Required inputs

Annexure 2 provides preliminary details of data needed from the City in order to carry out the projection. As the project progresses other items may be added to the list.

29 March 2004

APPENDIX 8: ADDITIONAL SLIDES PRODUCED FOR PRESENTATIONAL PURPOSES

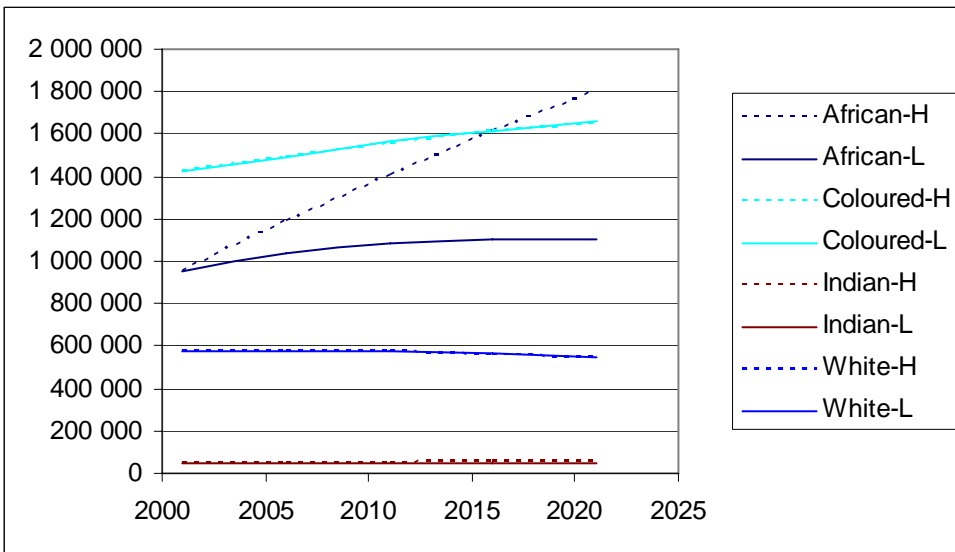


Figure 1 High and low projections by population group for the City of Cape Town

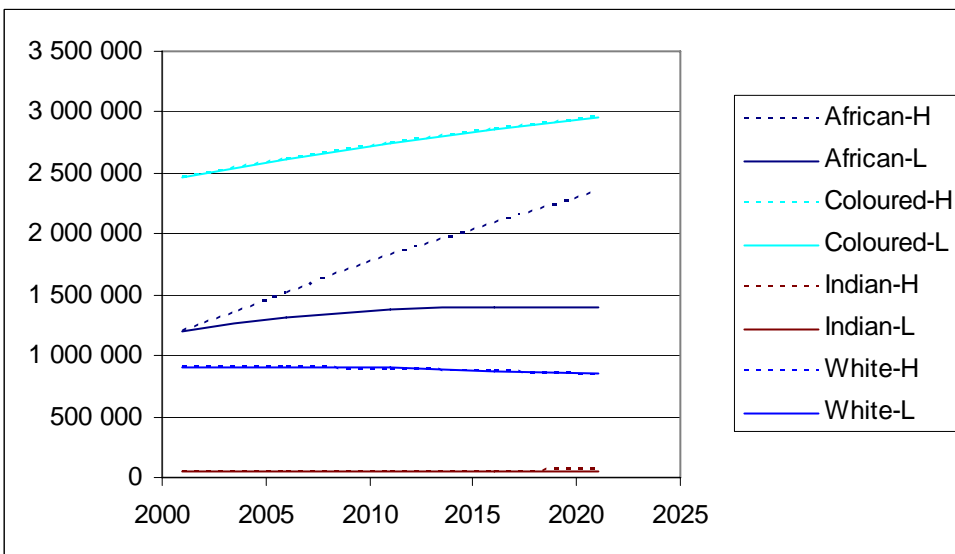


Figure 2 High and low projections by population group for the Western Cape

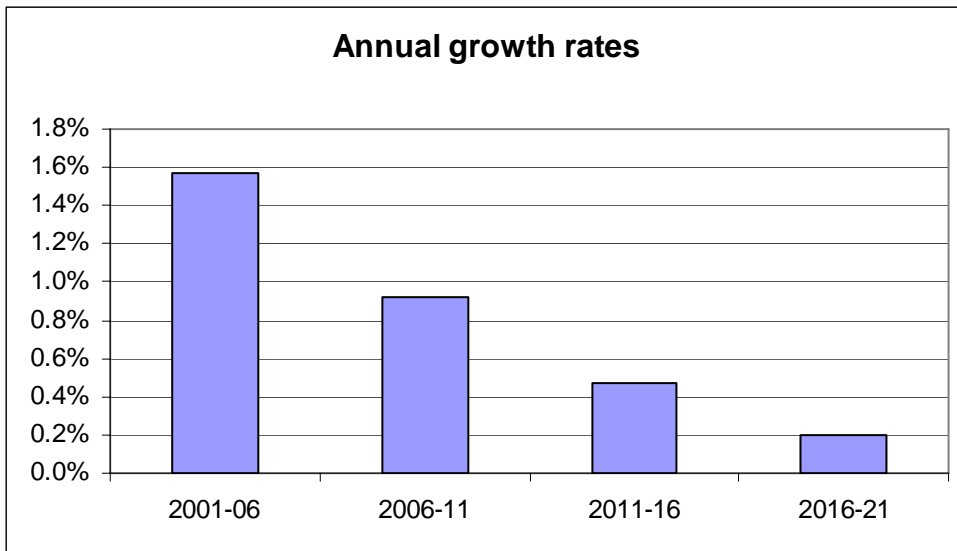


Figure 3 Annual growth rate of the population of the City of Cape Town

Table 4: Key indicator rates

	Annual rates			
	2001-06	2006-11	2011-16	2016-21
National				
Birth rate	2.1%	1.9%	1.7%	1.5%
Death rate	1.0%	1.2%	1.3%	1.4%
Natural increase	1.0%	0.7%	0.4%	0.2%
Net migration rate	0.5%	0.2%	0.1%	0.0%
Growth rate	1.5%	0.9%	0.5%	0.2%
African				
Birth rate	2.7%	2.3%	1.9%	1.7%
Death rate	1.1%	1.3%	1.5%	1.6%
Natural increase	1.6%	1.0%	0.4%	0.1%
Net migration rate	1.5%	0.5%	0.2%	0.1%
Growth rate	3.1%	1.5%	0.6%	0.1%
Coloured				
Birth rate	1.9%	1.9%	1.8%	1.7%
Death rate	0.9%	1.0%	1.1%	1.2%
Natural increase	1.0%	0.9%	0.7%	0.5%
Net migration rate	0.0%	0.0%	0.0%	0.0%
Growth rate	1.0%	0.9%	0.7%	0.5%
Indian				
Birth rate	1.6%	1.4%	1.3%	1.2%
Death rate	0.8%	0.9%	1.0%	1.1%
Natural increase	0.8%	0.5%	0.3%	0.1%
Net migration rate	0.4%	0.3%	0.2%	0.1%
Growth rate	1.2%	0.8%	0.4%	0.1%
White				
Birth rate	1.1%	1.0%	0.9%	0.9%
Death rate	1.2%	1.3%	1.4%	1.5%
Natural increase	-0.1%	-0.3%	-0.5%	-0.7%
Net migration rate	0.1%	0.1%	0.1%	0.0%
Growth rate	0.0%	-0.2%	-0.4%	-0.6%

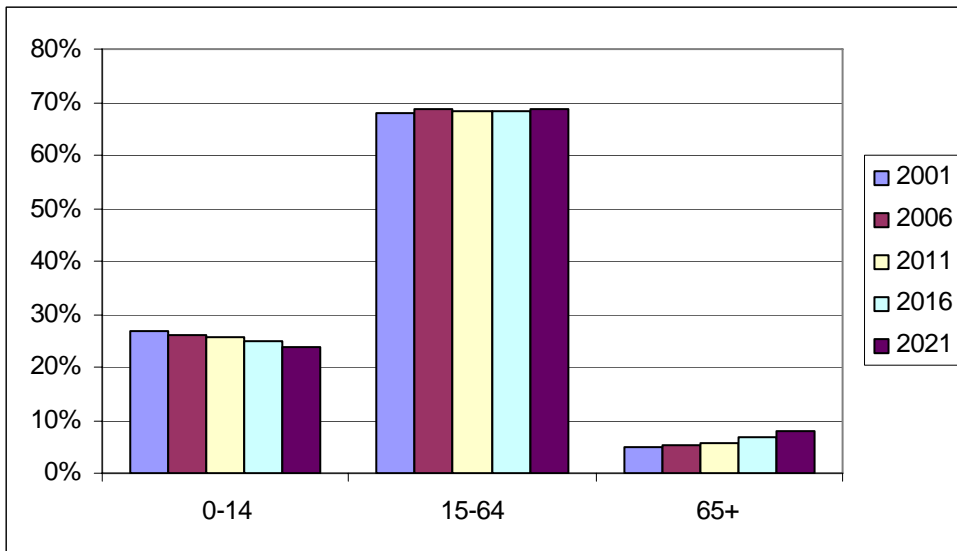


Figure 5 Population distribution by age group at five-yearly intervals

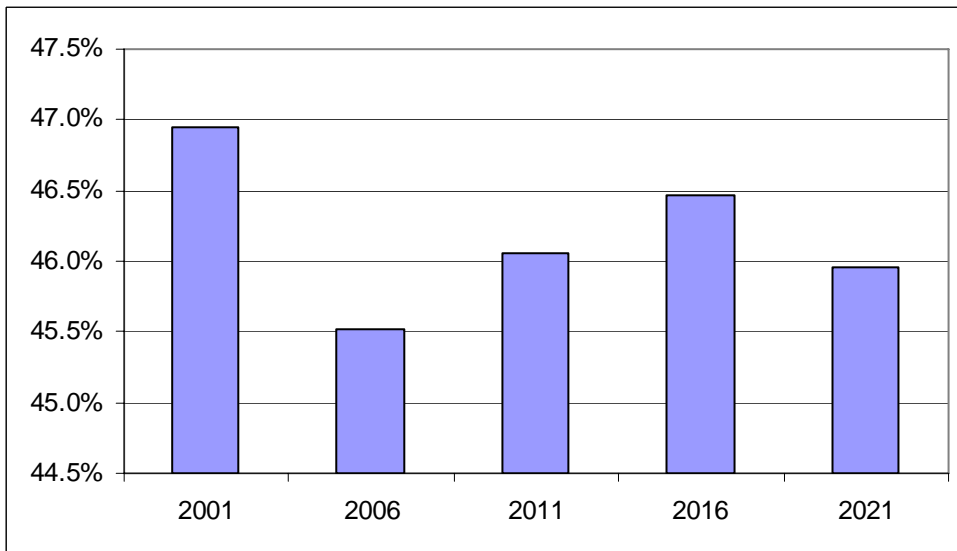


Figure 6 Dependency ratio at five-yearly intervals

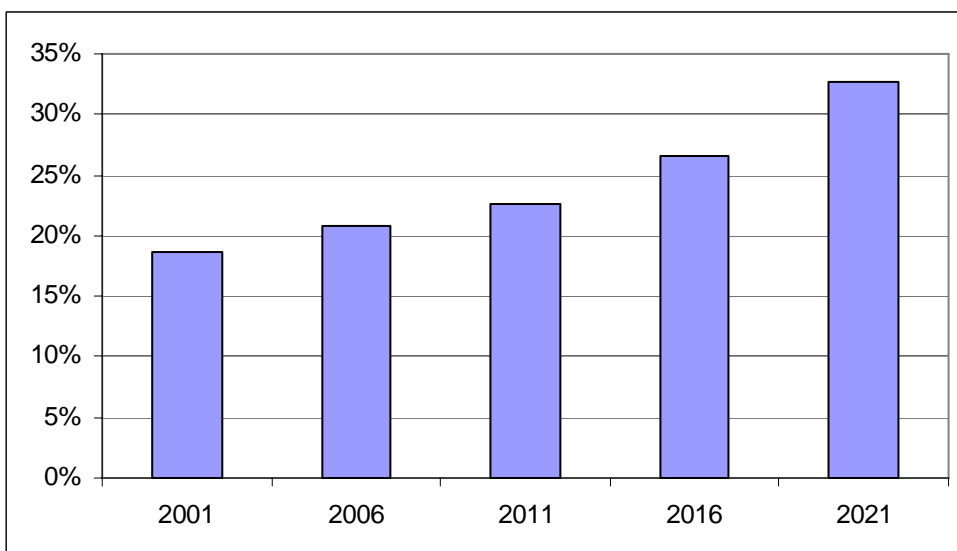


Figure 7 Ageing index

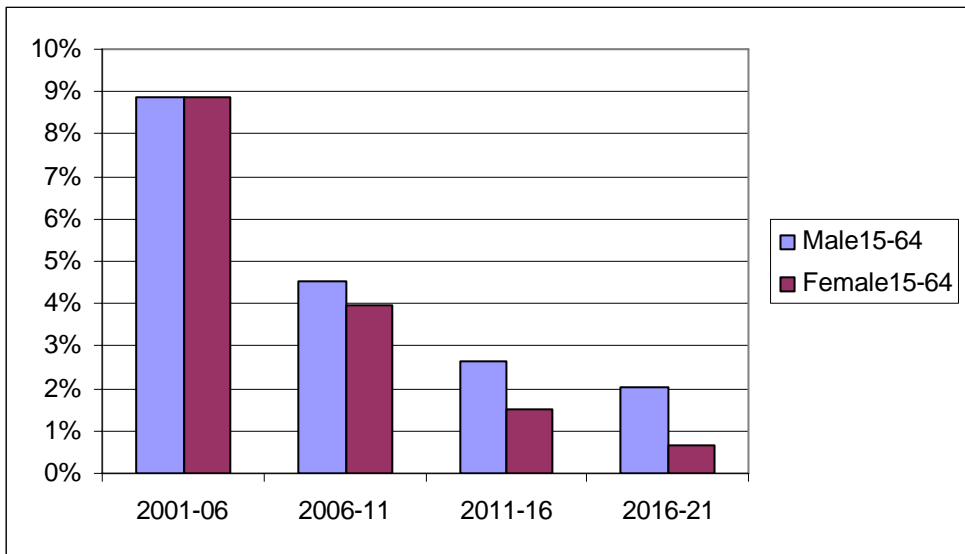


Figure 8 Five-yearly growth rates for population aged 15-64

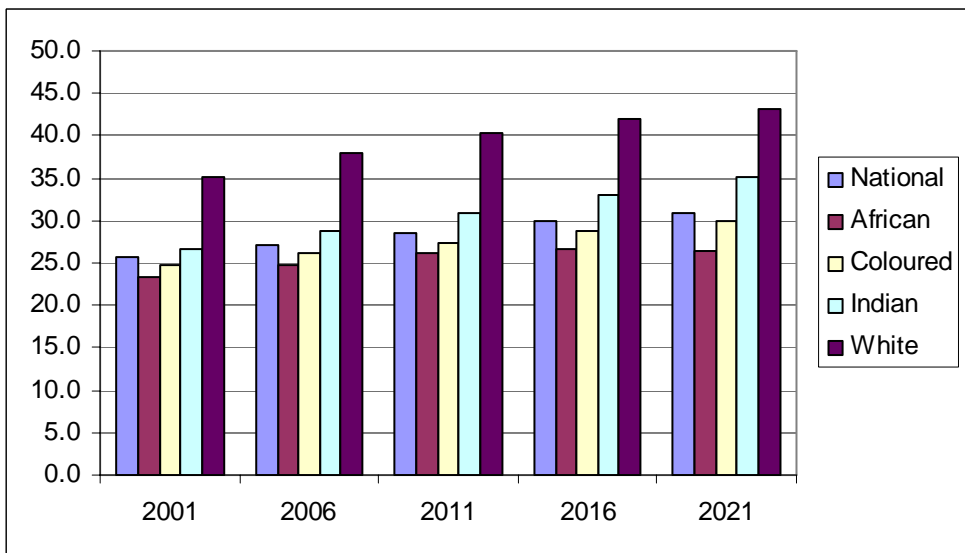


Figure 9 Median age (that age below which 50% of the population are aged) by population group at five-yearly intervals

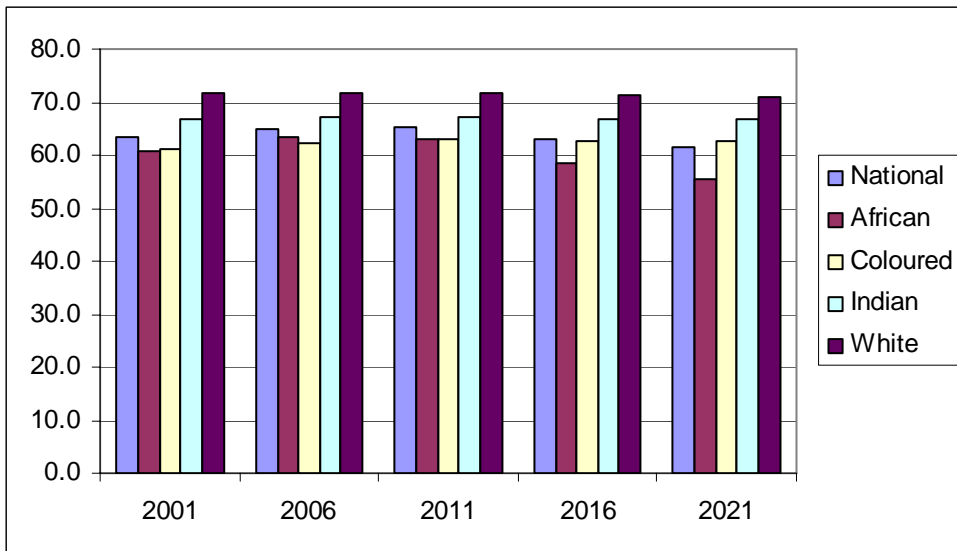


Figure 10 Life expectancy at birth by population group at five-yearly age intervals

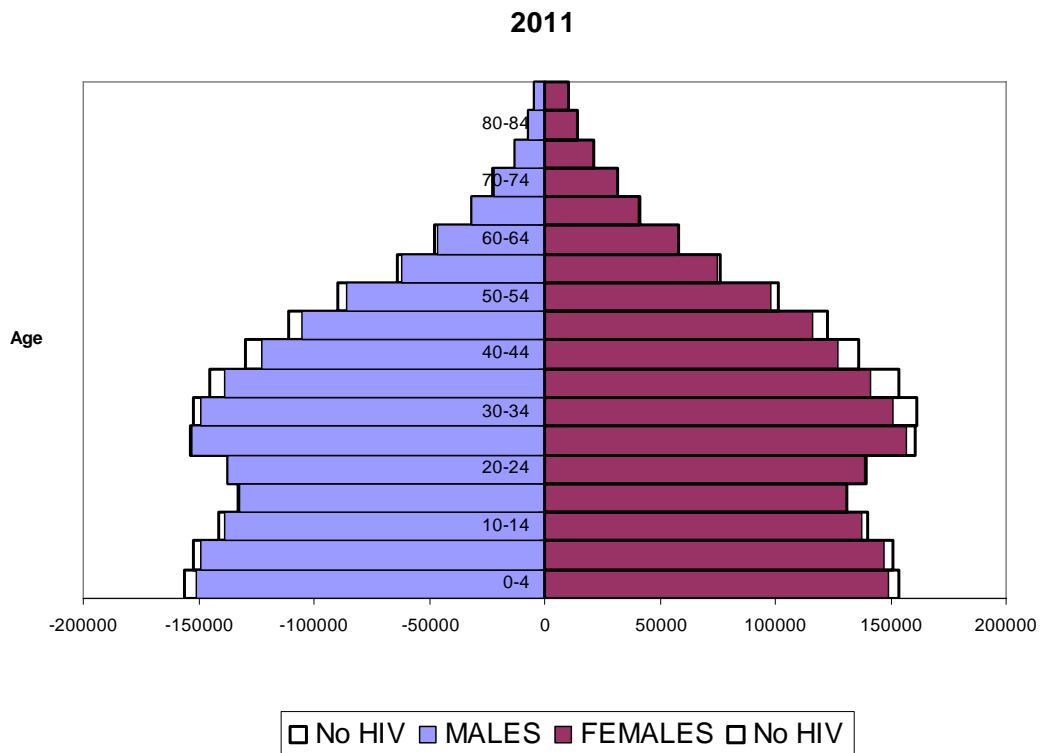


Figure 11 Population pyramid at 2011 (with and without an HIV epidemic)

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