

APPENDIX 1:

ESTIMATING DIFFERENTIALS IN THE TEACHER-BASED COST OF PUBLIC SCHOOL EDUCATION

Interim report to the National Treasury, 13th November, 2004¹

**Servaas van der Berg
Department of Economics
University of Stellenbosch**

Introduction

This paper briefly reports on the calculations undertaken with the aid of various datasets to arrive at estimates of educational cost differentials between beneficiaries from different race and income groups and by urban-rural location. Given the history of these differentials, and the results of the previous incidence analysis undertaken by the same author for the Department of Finance in 1999/2000 (see particularly Van der Berg 2000), the focus fell on the race-based differences. In brief, it was found that the race differentials were strongly reduced in this period, continuing a process that started immediately after the transition, through the equalisation of pupil-teacher-ratios between schools. There is still a large differential remaining, though, of about 28% rather than 71%, which is based on the differentials in the quality of teachers as measured by qualification levels and experience. This differential is likely to remain more enduring because of the difficulty of getting well qualified teachers into poor schools, particularly in rural areas, and is only moderated somewhat by the shift of black students into formerly white schools, a process that also is nearing its natural limits.

It is likely that the impact of the shift in teachers between schools that is reflected in teacher-pupils ratios would have had a considerable further impact on the targeting incidence of school spending, which was already commendable in 1997 because of almost universal access to education. This is likely to be reflected in the next step in the fiscal expenditure incidence analysis, to be completed by the end of this year.

Previous estimates: How well targeted is education spending?

¹ This study is funded by US AID through Nathan Associated.

Targeting accuracy can be summarised in the concentration index and the Kakwani progressivity index. The former is similar to the Gini coefficient, where a value of zero indicates complete equality of public expenditure. However, concentration curves, unlike Lorenz curves, can lie above the diagonal (the poorest quintile can receive more than one fifth of benefits from public expenditure, but not of income), thus the area above the diagonal contributes to negative values, where

$$\text{Concentration Index} = 1 - 2 \times (\text{Area under concentration curve})$$

and

$$\text{Kakwani Progressivity Index} = \text{Gini Coefficient} - \text{Concentration Index}$$

We shall confine our attention here to the concentration index. Where it is negative, spending is per capita progressive or targeted, i.e. strongly equity-enhancing. The last three columns of Table 1 show the concentration indices for education in 1993, 1995 and 1997, based on the earlier study, from which the shift in spending is evident. Also clear is that South African school education spending is quite well targeted in international comparison with other developing countries.

Table 1: Concentration indices for public spending on education in SA compared to a sample of developing countries, 1990s

| | Developing country sample | | | South Africa | | |
|-------------------|---------------------------|---------------|-------------|--------------|--------------|---------------|
| | Mean | Range | Sample size | 1993 | 1995 | 1997 |
| Education: | | | | | | |
| Primary | -0.14 | -0.44 to 0.19 | 34 | .. | .. | .. |
| Secondary | 0.12 | -0.23 to 0.72 | 38 | .. | .. | .. |
| All schools | .. | .. | | 0.079 | -0.016 | -0.078 |
| Tertiary | 0.39 | 0.04 to 0.76 | 31 | 0.261 | 0.235 | 0.223 |
| All education | 0.01 | -0.27 to 0.30 | 25 | 0.113 | 0.030 | -0.023 |

Concentration Index = 1 - 2 x Area under concentration curve

Source: Own calculations, based on applying geometry (i.e. assuming straight lines between observation rather than fitting curves to the data). These calculations are based on decile data. The calculations were based on the distribution of individuals, not households. Deciles/quintiles are equal sized in terms of households, not individuals.

Source: Developing country data from Yaqub 1999, Tables 2 and 5

South Africa's -0.023 in 1997 for all levels of education combined is somewhat below the mean of 0.01 for the 25 countries for which this information was available in Yaqub's (1999) sample, indicating that South African education spending is better targeted than most, despite

the poorly targeted university spending. Because spending is higher per rich child than per poor child, South Africa's primary education concentration index is likely to be worse than average, but South Africa's surprisingly high secondary education participation rates may imply somewhat better targeting than in most developing countries with poor access to secondary education, despite the cost differentials which still applied between white and black students.

How important are unit cost figures for determining educational fiscal incidence?

Internationally, fiscal incidence studies usually make the implicit assumption that unit costs do not differ between beneficiaries. In discussing benefit incidence analysis in Africa, Castro-Leal et al (1998; see also Demery 2000) identify three steps in the analysis:

“* Estimating the unit cost per person, or unit subsidy ..., of providing a service.

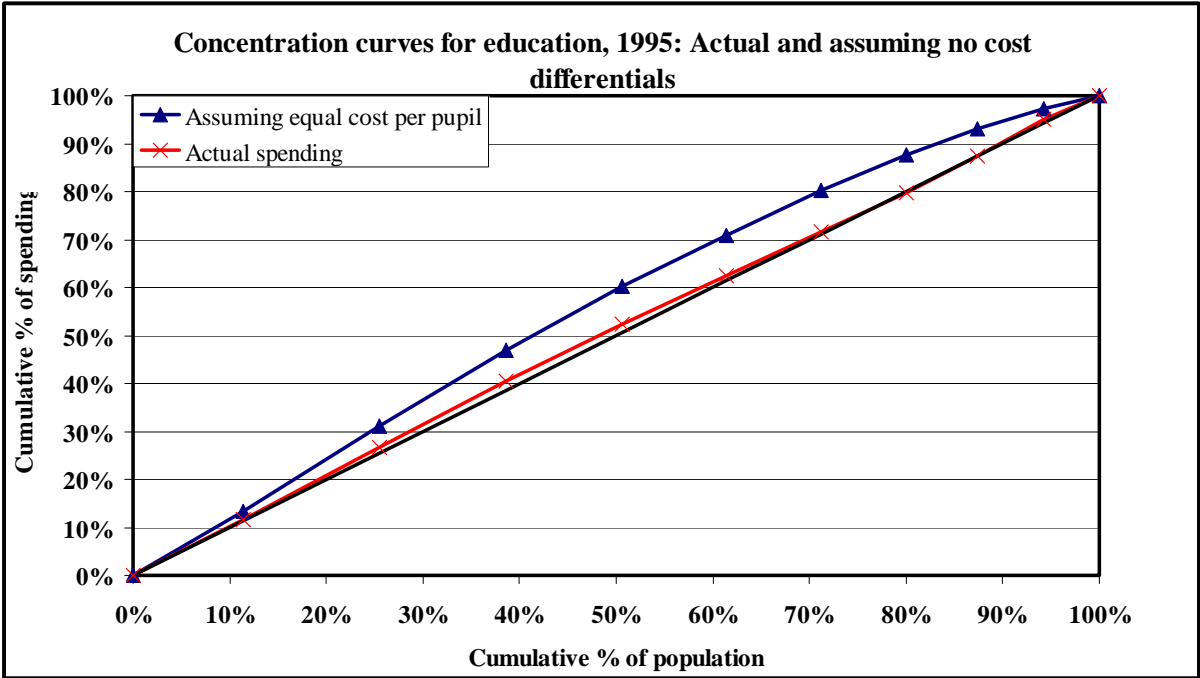
** Imputing the unit subsidy to households or individuals who are identified (usually from household surveys) as users of the service. Individuals who use a subsidized public service in effect gain an in-kind transfer. Benefit incidence measures the distribution of this transfer across the population.*

* Aggregating individuals (or households) into subgroups of the population to compare distribution of the subsidy among different groups.”

This essentially implies that the distribution of beneficiaries per service is the crucial step for determining benefit incidence for that particular service, and that the aggregate cost of the service then enters as a weight in aggregating all the different services. This methodology is used despite the fact that it is well known that the value (or the cost) of any particular public service provided to different members of a society often differs substantially across individuals, and, more importantly, often differs systematically between groups of individuals, e.g. urban and rural dwellers, or between different provinces. The latter fact is sometimes acknowledged in some benefit incidence studies, where administrative division between provinces allow a breakdown of unit costs by province, but the more important rural-urban differential is usually ignored because of difficulty of obtaining such data. Moreover, this would also further increase the implicit confusion in the benefit incidence analysis: Cost of delivery in rural areas may sometimes be very high, but the value (quality of the service) may be very low. The costs approach is nevertheless the one followed in such studies.

In South Africa, the nature of the apartheid legacy, particularly in education cost structures, made it imperative in earlier work on fiscal incidence to deal extensively with cost

differentials between beneficiaries. Yet these differentials were even by 1995 much reduced. The figure below sets out the concentration curves for actual education spending in 1995, versus the curve that would have applied had there been no cost differentials. As can be seen, cost differentials still had a considerable impact, and rather than a concentration index of -0.124, the actual concentration index for 1995 was -0.016. Thus, measuring cost differentials has a considerable impact on measured targeting accuracy. It increased the concentration index by 0.108, a considerable proportion compared to the estimated actual reduction of 0.157 in the index between 1993 and 1997. Disregarding cost differentials is, in education at least, not yet warranted and would only be once differentials in the public cost of education have been much further reduced than was the case in 1995.



New cost estimates

The datasets at our disposal unfortunately suffered from various deficiencies, some of which could perhaps be overcome, but that would require far more time and effort. For one, they were poorly linked and because of confused numbering, linking attempts often failed (provincial and national emis numbers often differ or are used inconsistently, examination centre numbers are not all linked to emis numbers, and neither could personal pay point numbers or component numbers all be linked to emis numbers). As a consequence, the datasets individually often provided useful information, but as soon as linking was attempted, a large proportion of schools were dropped from the analysis. The uncertainty here lies in whether such schools a reduction in the sample was randomly distributed. Precisely those schools and

provinces experiencing the worst education management also often had the most common data problems.

A second constraint was that a large proportion of some of the administrative data was of poor quality (e.g. many schools recorded school fees of 50 cents per annum, and some more than R1 million). Total pupil numbers did not match between datasets containing race distribution and those showing age distribution. Consequently, where race data had to be used, all these schools where this difference in pupil numbers was more than 10 were dropped from the dataset. In many cases former department was also not shown, thus considerably reducing the sample for which we could obtain data based on either race or former department.

The datasets used were the Annual School Survey of 2002; data obtained from the national department of education through the Education Foundation on school management, teachers and students; persal data for most teachers in the system, but not linked to schools; and persal data for a sample of 100 schools (500 primary and 500 secondary) in each province. However, it turned out that this last sample was firstly not random (schools were selected according to the ease of matching the school data to the persal data rather than through random sampling); some of the matching was wrong, so that the same persal numbers were sometimes linked to schools in different provinces. All these duplicates were dropped, as well as all the schools in which such duplicates occurred, considerably reducing the sample size. Also, the Persal datasets did not contain the true full cost of teachers to the state, as the state's contribution to pension funds and medical aid was not included. Consequently, the gross salaries plus fringe benefits, transport and housing subsidies, where these still applied, were used, on the assumption that the full costs to the state are likely to be approximately proportional to this. In addition, we also obtained a previous analysis of Persal data for the National Department of Education by Crouch and Gustaffson, as well as the systemic school evaluation. These datasets were only used for comparison purposes.

Most of the data relates to 2002, although the analysis is aimed at understanding the situation in 2000. However, as will be shown, teacher racial cost structures hardly changed between 1997 and 2002, so it appears that the use of the 2002 datasets would not fundamental affect the conclusions. The more important shifts in pupil-teacher ratios had been completed by 2000, thus little would have changed in the regard between 2000 and 2002. The previous study was also largely based on analysis of a 1997 dataset and conclusions then also drawn

for 1993 and 1995, so the interval of half a decade between the primary datasets is maintained (1997 to 2002, rather than 1995 to 2000).

The previous incidence study for National Treasury, undertaken in 1999/2000, pointed out that there were two important sources of cost differentials, historically largely based on race. One part was the difference in **teacher-pupil ratios** that applied in different schools and had been reduced but not yet eliminated by 1997. The other was the difference in the **cost per teacher**, which reflects a mixture of differences in post levels, qualifications and experience that are captured in the teacher remuneration structures. Earlier, discriminatory teacher salaries and promotion possibilities also affected both these aspects of teacher costs, but by 1997 that had been eliminated.

By 2000, all differentials in school post provisioning had been eliminated, so that an important source of differentials in cost per pupil had been eliminated. However, one aspect remained, viz. that primary teacher-pupil ratios were higher than secondary ones and primary school salaries lower, and poorer pupils are more likely to be in primary schools. This differences has to be incorporated in the analysis.

Regarding the cost differentials between teachers, the Persal dataset we had for employees in the public education sector allowed an analysis of some of the factors that determine gross salaries. Unfortunately, these could not all be linked to individual schools, so that it is not possible to show how these differ across schools. But some analysis was nevertheless possible.

Firstly, it was apparent that there are large cost differentials between teachers in different provinces and of different rate groups. However, a large part of these differentials can be explained by differences in qualification levels (REQV).The tables below show provincial and racial gross salaries plus benefits (excluding the state contribution to pension funds and medical aid) per annum.

Table 2: Annual cost of full-time permanent CS educators by race and province, 2002 (including gross salary, fringe benefits, transport and housing subsidy, but not state contribution to pension fund)

| | Black | Coloured | Indian | White | Total |
|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Eastern Cape | R 70 329 | R 83 918 | R 93 723 | R 98 086 | 72857.68 |
| Free State | R 73 655 | R 81 455 | R 95 541 | R 97 415 | 77625.16 |
| Gauteng | R 82 922 | R 87 136 | R 92 809 | R 98 853 | 89142.74 |
| Kwazulu-Natal | R 75 308 | R 86 561 | R 95 863 | R 99 468 | 80213.41 |
| Mpumalanga | R 75 819 | R 84 740 | R 92 435 | R 96 810 | 78509.29 |
| Northern Cape | R 70 309 | R 77 340 | R 124 536 | R 92 848 | 79333.67 |
| Limpopo | R 73 944 | R 69 560 | R 93 012 | R 98 531 | R 74 574 |
| Northwest | R 71 562 | R 80 392 | R 95 301 | R 97 727 | R 73 945 |
| Western Cape | R 82 472 | R 87 231 | R 100 681 | R 100 366 | R 89 623 |
| Total | R 74 127 | R 85 310 | R 95 473 | R 98 521 | R 78 730 |

The white/black differential of 33% found here is larger than that implied by a more careful analysis of the Persal dataset by Gustafsson for 2001, where this differential was only 23%. As the subsequent analysis is largely based on the same Persal data as shown here, there has to be a suspicion that, if anything, the cost differentials are somewhat exaggerated. Thus, the results would be conservative in terms of measuring the accuracy of targeting, if they are based on cost differentials that favour the rich more than is actually the case.

Table 3: Qualification levels (mean REQV) of full-time permanent CS educators by race and province, 2002 (Matriculation or equivalent only=REQV10, each additional year of tertiary education adds one unit to the REQV level)

| | Black | Coloured | Indian | White | Total |
|---------------|--------------|-----------------|---------------|--------------|--------------|
| Eastern Cape | 12.85 | 13.35 | 14.27 | 14.14 | 12.96 |
| Free State | 12.99 | 13.33 | 14.82 | 14.22 | 13.19 |
| Gauteng | 13.43 | 13.61 | 14.17 | 14.41 | 13.81 |
| Kwazulu-Natal | 13.19 | 13.65 | 14.60 | 14.27 | 13.48 |
| Mpumalanga | 13.29 | 13.35 | 14.03 | 14.35 | 13.43 |
| Northern Cape | 12.86 | 13.19 | 15.00 | 14.07 | 13.32 |
| Limpopo | 13.30 | 13.03 | 14.14 | 14.36 | 13.33 |
| Northwest | 12.76 | 13.60 | 14.07 | 14.41 | 12.92 |
| Western Cape | 13.62 | 13.48 | 14.27 | 14.35 | 13.70 |
| Total | 13.11 | 13.44 | 14.53 | 14.33 | 13.33 |

Table 4: Qualification levels (REQV) of full-time permanent CS educators by race, 2002
(Matriculation or equivalent only=REQV10, each additional year of tertiary education adds one unit to the REQV level)

| | Black | Coloured | Indian | White | Total |
|--------------------|----------------|-----------------|---------------|---------------|----------------|
| Numbers: | | | | | |
| REQV10 | 1 604 | 6 | 2 | 4 | 1 616 |
| REQV11 | 11 945 | 1 237 | 18 | 1 | 13 201 |
| REQV12 | 45 084 | 3 466 | 23 | 210 | 48 783 |
| REQV13 | 105 844 | 9 968 | 773 | 4 517 | 121 102 |
| REQV14 | 47 972 | 9 616 | 4 749 | 20 088 | 82 425 |
| REQV15 | 18034 | 2 827 | 2 329 | 8 598 | 31 788 |
| REQV16 | 4 950 | 913 | 1 557 | 3 237 | 10 657 |
| REQV17 | 271 | 87 | 163 | 718 | 1 239 |
| Total | 235 704 | 28 120 | 9 614 | 37 373 | 310 811 |
| Percentage: | | | | | |
| REQV10 | 0.7% | 0.0% | 0.0% | 0.0% | 0.5% |
| REQV11 | 5.1% | 4.4% | 0.2% | 0.0% | 4.2% |
| REQV12 | 19.1% | 12.3% | 0.2% | 0.6% | 15.7% |
| REQV13 | 44.9% | 35.4% | 8.0% | 12.1% | 39.0% |
| REQV14 | 20.4% | 34.2% | 49.4% | 53.8% | 26.5% |
| REQV15 | 7.7% | 10.1% | 24.2% | 23.0% | 10.2% |
| REQV16 | 2.1% | 3.2% | 16.2% | 8.7% | 3.4% |
| REQV17 | 0.1% | 0.3% | 1.7% | 1.9% | 0.4% |
| Total | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

Based on the above, if black mean salaries² at each REQV level were to apply, and if all race groups had the white REQV levels, mean salaries by race would have been as follows:

| | |
|-----------|----------|
| Blacks | R 88 272 |
| Coloureds | R 96 609 |
| Indians | R 93 419 |
| Whites | R 98 522 |
| Total | R 91 770 |

² The term “salary” or “gross income” here and subsequently refers to the annual gross salary plus fringe benefits, transport subsidies and housing subsidies, where these still exist, but excluding the state contribution to the pension fund and medical aid.

Based on these data, 58% of the black salary deficit to whites and 86 of the coloured deficit can be explained by the qualification level of teachers alone. Indian salaries are actually higher than those of whites, considering their REQV levels.

The figures above, however, do not consider the impact of post level. Post provisioning is now standard across all former departments, thus the structure of posts is consistent across schools. We now turn to investigating the relationship between salary, race, post level, qualification level and province by way of OLS regression analysis, with the dependent variable being the natural log of salary for all permanent full-time CS educators.

Table 5: Regressions showing effect of race, post level, qualification and province on the natural log of gross income (gross salary, fringe benefits, transport and housing subsidies, but excluding employer pension and medical aid contribution), 2002

| Dependent variable: Natural log of Gross Annual income | | | | | | |
|--|----------------------|---------------------|----------------------|--------------------------|---------------------|----------------------|
| | Regressions: All | | | Regressions: Blacks only | | |
| | Regression 1 | Regression 2 | Regression 3 | Regression 4 | Regression 5 | Regression 6 |
| Whites | 0.139 (98.83)** | 0.267 (178.23)** | 0.123 (82.00)** | | | |
| Indian | 0.132 (52.80)** | 0.279 (99.71)** | 0.129 (49.45)** | | | |
| Coloureds | 0.093 (63.60)** | 0.131 (77.51)** | 0.087 (45.05)** | | | |
| Post level 2 | -0.205 (1.26) | -0.432 (8.88)** | -0.219 (1.35) | -0.595 (2.57)* | -0.439 (8.28)** | -0.549 (2.35)* |
| Post level 3 | 0.057 (0.35) | -0.127 (2.61)** | 0.044 (0.27) | -0.317 (1.37) | -0.121 (2.28)* | -0.270 (1.16) |
| Post level 4 | 0.230 (1.41) | 0.052 (1.06) | 0.221 (1.36) | -0.130 (0.56) | 0.070 (1.31) | -0.093 (0.40) |
| Post level 5 | 0.408 (2.50)* | 0.279 (5.73)** | 0.394 (2.42)* | 0.044 (0.19) | 0.294 (5.53)** | 0.091 (0.39) |
| Post level 6 | 0.690 (4.19)** | 0.572 (10.42)** | 0.680 (4.15)** | 0.363 (1.56) | 0.633 (10.43)** | 0.401 (1.71) |
| Post level 7 | 0.768 (3.32)** | -0.060 (0.81) | 0.759 (3.30)** | -0.243 (0.74) | -0.015 (0.18) | -0.236 (0.72) |
| Post level 8 | -0.155 (0.55) | -0.103 (0.80) | -0.140 (0.50) | -0.503 (1.54) | -0.087 (0.66) | -0.493 (1.49) |
| Post level 9 | 0.000 (.) | -0.202 (2.21)* | 0.000 (.) | 0.000 (.) | -0.207 (2.13)* | 0.000 (.) |
| Post level 10 | 0.000 (.) | -0.197 (3.43)** | 0.000 (.) | 0.000 (.) | -0.174 (2.81)** | 0.000 (.) |
| REQV10 | -0.740 (127.94)** | | -0.743 (128.32)** | -0.734 (125.04)** | | -0.734 (124.91)** |
| REQV11 | -0.387 (182.78)** | | -0.384 (180.67)** | -0.379 (167.62)** | | -0.383 (169.76)** |
| REQV12 | -0.137 (110.58)** | | -0.141 (113.18)** | -0.140 (106.10)** | | -0.136 (103.05)** |
| REQV14 | 0.111 (100.91)** | | 0.107 (97.19)** | 0.113 (87.39)** | | 0.117 (90.70)** |
| REQV15 | 0.183 (119.19)** | | 0.176 (114.00)** | 0.175 (91.24)** | | 0.186 (96.80)** |
| REQV17 | 0.216 (87.68)** | | 0.206 (83.81)** | 0.202 (58.54)** | | 0.220 (63.68)** |
| REQV17 | 0.000 (.) | | 0.000 (.) | 0.000 (.) | | 0.000 (.) |
| REQV18 | 0.122 (0.53) | | 0.129 (0.56) | 0.107 (0.46) | | 0.101 (0.43) |
| Eastern Cape | | | -0.022 (16.45)** | -0.030 (20.82)** | -0.092 (56.43)** | |
| Free State | | | 0.026 (13.64)** | 0.028 (13.66)** | -0.021 (9.04)** | |
| Gauteng | | | 0.052 (32.34)** | 0.080 (42.24)** | 0.081 (36.83)** | |
| Kwazulu-Natal | | | 0.010 (7.08)** | 0.005 (3.26)** | -0.023 (13.23)** | |
| Mpumalanga | | | 0.011 (5.93)** | 0.009 (4.43)** | 0.001 (0.46) | |
| National department | | | 0.000 (.) | 0.000 (.) | 0.000 (.) | |

| | | | | | | |
|---------------|-----------|------------|-----------|-----------|------------|-----------|
| Northern Cape | | | -0.029 | -0.013 | -0.071 | |
| | | | (8.46)** | (1.94) | (8.93)** | |
| Northwest | | | 0.035 | 0.037 | -0.032 | |
| | | | (20.16)** | (20.31)** | (15.32)** | |
| Western Cape | | | 0.029 | 0.024 | 0.052 | |
| | | | (13.18)** | (5.70)** | (10.73)** | |
| Constant | 11.302 | 11.510 | 11.310 | 11.681 | 11.536 | 11.640 |
| | (69.23)** | (236.64)** | (69.62)** | (50.41)** | (217.75)** | (49.81)** |
| Observations | 309581 | 309785 | 309581 | 235442 | 235622 | 235442 |
| R-squared | 0.53 | 0.37 | 0.53 | 0.50 | 0.32 | 0.49 |

Absolute value of t statistics in parentheses

** significant at 5%; ** significant at 1%*

Note: The reference group is, where applicable, black, post-level 1, with an REQV of 13 (the most common value, with three years of tertiary education), and from Limpopo Province

The first three regressions show the whole teaching population (permanent full-time CS educators). The premia in Regression 1 imply that whites employed in the same posts and with the same qualifications as blacks earn 14.9% more, Indians 14.2% more and Coloureds 9.8% more. The small provincial differences account for a small part of this differential, with the residual premia (13.1%, 13.8% and 9.1% for whites, Indian and Coloureds compared to blacks) in Regression 3 then largely reflecting the distribution of experience across the groups. However, more relevant for present purposes are the differences without considering qualifications levels, because a major part of the higher cost in formerly white schools arises from the higher qualification levels of the teachers employed there. Judging only by the race of the teacher and not yet that of the beneficiary children, white teachers in the same post levels earn on average 30.6% more than black teachers, Indian teachers 32.1%, and coloured teachers 13.9% (derived from the coefficients in Regression 2). This therefore confirms that almost 60% of remaining salary differentials between white and black teachers in similar posts derive from the differences in qualifications, and the remainder from differences in experience. These differentials will be used in the subsequent calculations.³

This indicates that there are substantial differences between the salaries earned by teachers of the different race groups. Little has changed in this regard, which is not surprising, considering that qualification levels and experience are slow to change. Thus, the estimate of the 30.6% premium that white teachers are earning is very similar to the 27.9% calculated for 1997 in the previous incidence study. It is worth remembering that our Persal figures perhaps exaggerate the gap between white and black salaries, as referred to earlier.

³ Inserting a female dummy in regression 1 showed that female teachers earned on average 2.5% less than their male counterparts, when all the available other variables were considered. However, this information is not used in the further analysis.

Data on the distribution of teachers was obtained by matching the PERSAL data to the component numbers linked to schools. Though although only some one-quarter of full-time permanent teachers were retained within the sample (there were many non-matches, and many schools did not provide information on former department), it was still a large enough group to give fairly accurate information..

Table 8: Race composition and former department of teachers as obtained from PERSAL data matched to Annual School Survey 2002

| | Black | Coloured | Indian | White | Total |
|--------------|---------------|-----------------|---------------|---------------|---------------|
| DET | 37 924 | 786 | 40 | 742 | 39 492 |
| HOR | 90 | 17 779 | 37 | 322 | 18 228 |
| HOD | 6 | 28 | 107 | 47 | 188 |
| HOA | 48 | 248 | 6 | 8 034 | 8 336 |
| New | 7 | | | | 7 |
| Total | 38 075 | 18 841 | 190 | 9 145 | 66 251 |
| DET | 99.6% | 4.2% | 21.1% | 8.1% | 59.6% |
| HOR | 0.2% | 94.4% | 19.5% | 3.5% | 27.5% |
| HOD | 0.0% | 0.1% | 56.3% | 0.5% | 0.3% |
| HOA | 0.1% | 1.3% | 3.2% | 87.9% | 12.6% |
| New | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| Total | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |

Data on the racial composition of schools confirm that more than 99½% of black teachers are in mainly black schools, whereas there are more teachers from the other race groups in black schools. If this is considered, costs per teacher would be slightly higher in black schools because of the more expensive teachers from other race groups, whereas costs in white schools would be little affected by the few black teachers in such schools.

Applying these ratios to the cost differentials per teacher, the costs ratios per teacher in the different former departments would be as follows:

DET 100; House of Representatives (coloured) 113.2; House of Delegates (Indians) 126.3; House of Assembly (Whites) 130.2 New schools 99.1

Assuming equal teacher-pupil ratios and ignoring the primary-secondary differential, one finds that the costs per child differ as follows for children of the different race groups:

Coloured 10.8% higher than blacks, Indians 17.6% higher, and whites 25.1% higher.

But the primary teacher pupil-ratios are higher and primary teachers less qualified and therefore less remunerated, whilst the black population has a greater numerical domination at primary schools. This still needs to be considered. Table 9 shows the distribution of children by race and grade.

Table 9: Number of students by grade and race, Annual School Survey 2002

| | Black | Coloured | Indian | White | Other/ Unknown | Total |
|------------------|------------------|-----------------|----------------|----------------|---------------------------|-------------------|
| Grade 1 | 1 088 349 | 89 624 | 17 492 | 52 394 | 7 617 | 1 255 476 |
| Grade 2 | 824 854 | 79 917 | 12 003 | 49 524 | 6 710 | 973 008 |
| Grade 3 | 783 517 | 64 913 | 8 678 | 50 414 | 5 842 | 913 364 |
| Grade 4 | 874 613 | 84 259 | 12 594 | 53 326 | 6 961 | 1 031 753 |
| Grade 5 | 923 731 | 98 030 | 13 596 | 55 470 | 7 232 | 1 098 059 |
| Grade 6 | 827 356 | 88 920 | 13 590 | 56 615 | 7 175 | 993 656 |
| Grade 7 | 763 148 | 81 232 | 12 917 | 55 915 | 6 864 | 920 076 |
| Grade 8 | 738 568 | 72 151 | 9 853 | 55 215 | 10 479 | 886 266 |
| Grade 9 | 868 402 | 77 156 | 13 356 | 185 762 | 11 464 | 1 156 140 |
| Grade 10 | 680 474 | 60 737 | 14 172 | 53 767 | 10 337 | 819 487 |
| Grade 11 | 556 576 | 41 734 | 13 007 | 52 408 | 8 770 | 672 495 |
| Grade 12 | 354 521 | 30 098 | 10 734 | 48 275 | 7 682 | 451 310 |
| Total | 9 284 109 | 868 771 | 151 992 | 769 085 | 97 133 | 11 171 090 |
| Primary | 6 085 568 | 586 895 | 90 870 | 373 658 | 48 401 | 7 185 392 |
| Secondary | 3 198 541 | 281 876 | 61 122 | 395 427 | 48 732 | 3 985 698 |
| % primary | 65.5% | 67.6% | 59.8% | 48.6% | 49.8% | 64.3% |

It was found in the previous incidence study that the differential between primary and secondary salaries was about 14%, but did not differ significantly by race. Moreover, if we now also allow for a ratio of 37 teachers per pupils in primary schools, versus 34 in secondary schools, the cost per student would then vary by race as shown in the final column of Table 10 (all ratios relative to black income). The comparison with the 1997 situation (second last column) is particularly interesting.

Table 10: Estimated cost ratios per student, 2000 (2002) versus 1997

| | 1997 | 2000 (2002) | 2000 (2002) (using IES primary- secondary ratios) |
|----------------|-------------|--------------------|--|
| Blacks | 100 | 100 | 100 |
| Coloureds | 120.3 | 110.5 | 110.6 |
| Indians | 162.9 | 118.5 | 120.3 |
| Whites | 171.1 | 128.8 | 127.8 |
| Others/Unknown | 133.6 | 121.8 | |

In the case of whites, where the largest differences existed historically, this premium of 28.8% in the cost per student compared to blacks is much smaller than the estimate that was obtained for 1997, viz. 71.1%. Clearly, the half a decade since has seen considerable change in the distribution of the cost of education, mainly taking the form of a reduction in the teacher-pupil ratio differentials between former white and former black schools. The remaining differentials are in large part the results of differences in teachers qualifications, differences in teachers experience, and the greater weight of white students in the more expensive part of the school system, high schools.

Thus, we have been able to estimate, with a fair degree of confidence, the reduction in cost differentials that had occurred between children who are members of the different race groups in the period 1997 to 2002. However, salary structures have remained largely unchanged, and post provisioning was already equalised by 2000, so these cost structures can be used for the year 2000 as well.

There is one aspect of the cost differentials which has not yet been dealt with, and that is those amongst the black population. One part of the black population has joined formerly white, Indian or coloured schools, thus obtaining greater benefits from public spending. Also, there are differences within formerly black schools, largely resulting from the fact that it is difficult to attract better qualified teachers to poorer, particularly rural schools.

For the relatively small sample (just over 600) of black teachers for whom we had information in this regard, those located in what were termed urban schools earned on average 9.8% more than similar teachers in rural schools. But the small size of this sample, the likelihood that the sample was non-random (there may have been systematic bias in which schools had

information on their location), and the fact that rural pupils often attend town-based schools, makes this information of dubious value.

An alternative indication is found from regression in Table xxx above, which shows a positive and significant coefficient for Gauteng, the most urban province, when not including the qualification levels of teachers in the model. This implies that Gauteng (black) teachers earn on average xxx% more than their counterparts in similar posts in the reference province, Limpopo, which is a poor and relatively rural province. This could be either the result of experience or, more likely, urban teachers being better qualified in terms of REQV. Though some of the other provinces are also urbanised, thus reducing perhaps the magnitude of this coefficient, the reference. This differential between urban and rural can be further used in the modelling of the final incidence analysis.

Conclusion

Despite data deficiencies, the data is clear enough that there has been a continuation of the improved targeting of public school education spending, regarding teacher salaries, largely because of the equalisation of teacher-pupil ratios combined with the already good access of the poor to school education, even in deep rural areas, and the fact that the poor have more children. It is likely that the concentration index for school education would show a further substantial reduction, making it more negative, once this data has been combined with the survey data showing access to education. This is the material that will be used for the final study.

Bibliography

- Castro-Leal, Florencia. 1998. *Poverty and inequality in the distribution of public education spending in South Africa*. South Africa: Poverty and Inequality Informal Discussion Paper Series. Washington, D.C.: World Bank
- Castro-Leal, Florencia; Dayton, Julia; Demery, Lionel; and Mehra, Kalpana. 1998. *Public social spending in Africa: Do the poor benefit?* Processed. Washington, D.C.: World Bank
- Demery, Lionel. 2000. *Benefit incidence: a practitioner's guide*. Poverty and Social Development Group, Africa Region. World Bank: Washington, D.C.
- Janisch, Catherine Ann. 1996. *An analysis of the burdens and benefits of taxes and government expenditure in the South African economy for the year 1993/94*. Unpublished Masters dissertation. Pietermaritzburg: University of Natal
- Van der Berg, Servaas. 2000. *An analysis of fiscal incidence of social spending in South Africa, 1993-97*. Report to the Department of Finance, Pretoria funded by Deutsche Gesellschaft für Technische Zusammenarbeit (German Agency for Technical Cooperation, gtz). Mimeo. Stellenbosch. 17pp.

Yaqub, Shahin. 1999. *How equitable is public spending on health and education?* Background paper to *World Development Report 2000/1*. Poverty Research Unit, Sussex University. September. 23pp. Online:
www.worldbank.org/poverty/wdrpoverty/background/yaqub.pdf

APPENDIX 2:

INCIDENCE OF HEALTH SPENDING

Interim report to the National Treasury, 15th November, 2004⁴

Ronelle Burger assisted by Kara Mackay
Department of Economics
University of Stellenbosch

This section investigates the incidence of health spending across income, race and space. To answer this question two issues are explored: firstly, whether there are systematic differences across income groups, race and space in the cost of health provision and then secondly, whether there are there systematic differences across income groups, race and space in patterns of utilization⁵.

The focus here is broadly on equity. In the health literature this concept is often understood to refer to equality of opportunity, with access to a doctor arguably representing the most appropriate empirical measure of this. In a recent report on health and inequality Di McIntyre highlights three possible sources of inequity, namely

- funding,
- delivery and
- health status or health outcomes.

Whereas the first two dimensions of inequity clearly relate to health services, the last dimension is considerably broader and is influenced by the accessibility and quality of health services as well as factors outside the scope of health services including the individual's environment, lifestyle choices, occupational safety, health knowledge and genetics. The discussion here concentrates on the first dimension of inequity. The second dimension of equity will be covered briefly at the end of this section of the report. The third dimension of inequity is considered to fall outside the scope of this report.

⁴ This study is funded by US AID through Nathan Associated.

⁵ The latter would include questions about patterns in the frequency of the type of service and the associated cost of the type of service utilized

DATA AND METHODOLOGY

The analysis is restricted by the data available. No survey has adequate data on both health services utilization and household income. The General Household Survey (GHS) comes closest, but its lack of comprehensive income information limits the sophistication of the analysis. The available information on salary income does not allow the construction of quintiles due to 40% of households reporting zero salary income. The Income and Expenditure surveys have sufficient information on income to construct quintiles, but unfortunately contain no information on the utilization of health services, only on health expenditure. Due to the provision of free services to the poor the latter is unlikely to provide an adequate representation of the utilization patterns for health services.⁶

Although the health utilization data in the GHS 2003 is superior to that in other surveys, it still has its shortcomings. The survey does for instance not contain any details on the cost of the service or type of service utilized – it just provides information on the place of consultation and the type of health worker who was consulted.,

Also, the data available does not enable tracking changes in health spending and incidence over time. The Health Department's 2000 per hospital expenditure data that is used here to examine systematic differences in hospital costs are not available before that year. There are no surveys that would allow a comparison of how the utilization of public health services has changed from the mid or late nineties. The GHS, which is used for investigating utilization patterns, was only introduced in 2002. The 1993 Project for Statistics on Living Standards and Development data set does not distinguish between private and public clinics and hospitals. The data set provides general information on health outcomes including variables on the prevalence of illness and health worker consultation. It also provides some specific quality and cost measures, but because the survey does not distinguish between public and private health institutions this is of little use for tracking trends pertaining to the questions asked here. The 1995 and 1997 October household surveys have no information on the utilization of health services and the 1999 October household survey will not provide a long enough time

⁶ Efforts to use variables common to both the GHS and IES to model non-salary income proved unsuccessful. The South African Demographic and Health Survey has more detailed information on health utilization than the GHS, but the survey has neither income nor expenditure information.

period for comparison. The 1998 Demographic and Health Survey has detailed information on the utilization of health services, but includes no income or expenditure data.

There are also issues concerning the reliability of data. The deficiencies of the IES 2000 have been well documented including both sampling and data coding problems. The Department of Health's hospital and clinic expenditure data set is still in an experimental/development phase with many seeming discrepancies and irregularities. With a few exceptions, the Department has preferred to leave the expenditure figures in the data base unquestioned and untouched, as reported by the provinces.

The analysis that follows attempts to use the various data sources available in a responsible way - with an awareness of its shortcomings - to provide some indication of who is benefiting from the money the government is spending on health. Despite its limitations, the available data sets can provide adequate answers to most of the questions posed:

- Hospital costs accounts for approximately 60% of the health budget, thus the incidence analysis will concentrate on hospital costs and utilization.
- The Department of Health's National Hospital data base and their per hospital expenditure data can be used to calculate average hospital unit costs for each province.
- Patterns of usage for different population groups, income groups and areas are investigated using both the GHS 2003 and the IES 2000.
- Average subsidies/transfers can be calculated for different groups using the usage patterns and average hospital unit costs
- The GHS 2003 allows a first round assessment of differences in service delivery and service quality across space, race and income groups

1. EQUITY OF HEALTH FUNDING

1.1 THE COST OF PUBLIC HEALTH SERVICES

Despite hospital utilization being considerably lower than that of clinics, expenditure on hospitals is a multiple of expenditure on clinics. Approximately 60% of the total health budget is spent on hospitals while expenditure on clinics represents just slightly more than 10% of the budget, according to the 2004 Intergovernmental Fiscal Review. The rest of the budget is made up out of minor items – none bigger than 5% – such as health facilities management, health care support and administration costs. This provides the motivation for focusing this analysis of health spending on hospitals.

To avoid the once-off “lumpiness” of capital expenditure, capital expenditure items are removed from hospital cost totals before averages are calculated. According to the 2004 Intergovernmental Fiscal Review, current payments account for almost 90% of expenditure.⁷ To investigate the incidence of health funding, an estimate of the average cost of providing hospital services is required. The hospital expenditure entries are matched with the National Hospital data base’s utilization statistics for 2000/1 to calculate a unit cost for each hospital over this period. The unit cost measure used is the actual current expenditure⁸ per inpatient day. Outpatient days were not included in the calculation because it was unavailable for a large number of hospitals in the sample.

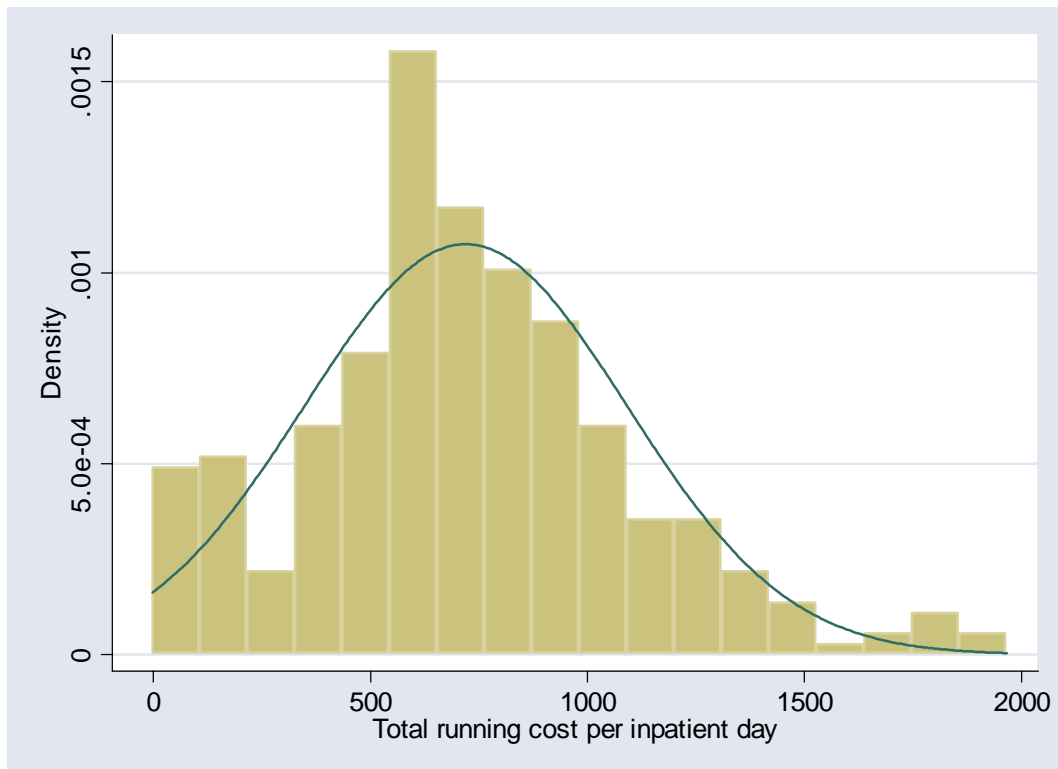
Alternatively, the actual current expenditure per inpatient visit (thus including length of stay) could be used as the unit, but seeing that hospital utilization by outpatients is less costly and the ratio of inpatient to outpatient visits is approximately 1 to 5 according to Intergovernmental Fiscal Review, an inpatient day is considered to be a sensible middle ground estimate for a hospital unit of utilization.

An average unit cost is calculated for each province, using the total number of inpatients as a weighting factor. Specialised hospitals were excluded from the sample for the calculation of the average. Figure 1 below displays the distribution of hospital current expenditure per inpatient day and Table 1 shows the average unit cost per province.

⁷ Personnel costs make up almost 70% of running cost

⁸ Here actual recurrent expenditure was estimated by excluding any expenditure identified as capital expenditure of expenditure on land and buildings from the total. “Actual” is used here to distinguish what was spent by the institution from budgeted expenditure.

FIGURE 1: Distribution of hospital unit cost measure



Source: DoH's National Hospital data base, Expenditure per hospital data base

| Province | Mean | Std. Dev. | Observations |
|-----------------|-------------|------------------|---------------------|
| Eastern Cape | 772 | 402 | 67 |
| Free State | 1118 | 723 | 29 |
| Gauteng | 1132 | 394 | 28 |
| KwaZulu-Natal | 886 | 324 | 68 |
| Limpopo | 725 | 235 | 42 |
| Mpumalanga | 1147 | 1123 | 26 |
| NorthWest | 698 | 220 | 23 |
| Northern Cape | 425 | 268 | 24 |
| Western Cape | 1251 | 803 | 37 |
| Total | 960 | 551 | 344 |

Source: DoH's National Hospital data base, Expenditure per hospital data base

It has been observed that tertiary hospitals have a higher unit cost than other types of hospitals – presumably due to costs associated with the training function and specialization of tertiary

hospitals. For this reason Table 2 shows provincial average unit costs excluding tertiary hospitals.

| TABLE 2: Provincial means for hospital unit cost for a sample of public hospitals - excluding tertiary hospitals, 2000/1 | | | |
|---|-------------|------------------|---------------------|
| Province | Mean | Std. Dev. | Observations |
| Eastern Cape | 772 | 402 | 67 |
| Free State | 893 | 364 | 28 |
| Gauteng | 953 | 300 | 23 |
| KwaZulu-Natal | 858 | 315 | 66 |
| Limpopo | 695 | 221 | 41 |
| Mpumalanga | 1147 | 1123 | 26 |
| NorthWest | 698 | 220 | 23 |
| Northern Cape | 425 | 268 | 24 |
| Western Cape | 769 | 620 | 34 |
| Total | 835 | 471 | 332 |

Source: DoH's National Hospital data base, Expenditure per hospital data base

1. 2 UTILIZATION OF PUBLIC HEALTH SERVICES

Utilization patterns are examined by population groups, area and income group. The GHS 2003 is used for the analysis. A household expenditure category variable is preferred above salary income as proxy for income. This is motivated by three considerations. Firstly, salary can be a poor proxy for income. Then secondly, the interest here is more in the bottom part of the welfare distribution than the top and as reported earlier the salary variable does not provide any separation for the bottom 40%. Furthermore, it is often argued that expenditure provides a more reliable measure of a household's welfare. The expenditure variable contains eight household expenditure brackets, with the top bracket for a monthly income of R10 000 and above.

It is clear from Table 3 that most of public hospital patients do not have medical aid. According to the GHS 2003 approximately two thirds of medical aid patients who reported

having utilized hospitals over the previous month chose private hospitals. Also, as would be expected, Tables 4 and 5 show that medical aid membership is more prevalent among white households and households with higher expenditure levels.

**TABLE 3: Utilization of public hospitals
by medical aid membership, 2003**

| | Number | Proportion |
|----------------|----------------|-------------------|
| No medical aid | 802,545 | 0.95 |
| Medical aid | 41,167 | 0.05 |
| Total | 843,712 | 1.00 |

Source: GHS 2003

**TABLE 4: Medical aid membership
by expenditure category, 2003**

| Expenditure category | Mean | Std. Dev. | Observations |
|---------------------------------|-------------|------------------|---------------------|
| R 0 - R 399 | 0.05 | 0.21 | 22 600 |
| R 400 – R 799 | 0.06 | 0.24 | 30 365 |
| R 800 – R 1 199 | 0.10 | 0.30 | 14 887 |
| R 1 200 – R 1 799 | 0.15 | 0.36 | 8 756 |
| R 1 800 – R 2 499 | 0.24 | 0.43 | 5 929 |
| R 2 500 – R 4 999 | 0.37 | 0.48 | 7 580 |
| R 5 000 – R 9 999 | 0.52 | 0.50 | 4 283 |
| R10 000 or more | 0.63 | 0.48 | 1 744 |
| Total | 0.14 | 0.35 | 96 144 |

Source: GHS 2003

| TABLE 5: Medical aid membership by population group, 2003 | | | |
|--|-------------|------------------|---------------------|
| Population group | Mean | Std. Dev. | Observations |
| Black | 0.08 | 0.27 | 77126 |
| Coloured | 0.19 | 0.39 | 11658 |
| Indian | 0.35 | 0.48 | 2245 |
| White | 0.65 | 0.48 | 8192 |
| Total | 0.15 | 0.35 | 99221 |

Source: GHS 2003

According to Table 6 the occurrence of illness varies between 0.104 and 0.123 for the different expenditure categories. Reported illness and injury are notably higher for the top expenditure categories. There does not appear to be a steady linear relationship between the occurrence of illness and the expenditure categories, but this could be at least partly due to the inappropriateness of household expenditure – instead of household expenditure per capita – as a measure of household welfare.

Table 7 produces similar conclusions: health worker consultations are higher among the top expenditure categories, but there seems to be no reliable linear relationship between expenditure and the decision to consult a health worker.

| TABLE 6: Reported illness and injury by expenditure category, 2003 | | | |
|---|-------------|------------------|---------------------|
| Expenditure category | Mean | Std. Dev. | Observations |
| R 0 - R 399 | 0.118 | 0.323 | 22 625 |
| R 400 – R 799 | 0.104 | 0.305 | 30 411 |
| R 800 – R 1 199 | 0.110 | 0.313 | 14 905 |
| R 1 200 – R 1 799 | 0.109 | 0.312 | 8 765 |
| R 1 800 – R 2 499 | 0.116 | 0.321 | 5 937 |
| R 2 500 – R 4 999 | 0.123 | 0.328 | 7 590 |
| R 5 000 – R 9 999 | 0.120 | 0.325 | 4 283 |
| R 10 000 or more | 0.127 | 0.333 | 1 744 |
| Total | 0.112 | 0.315 | 96 260 |

Source: GHS 2003

| TABLE 7: Consulted health worker as result of illness and injury by expenditure category, 2003 | | | |
|---|-------------|------------------|---------------------|
| Expenditure category | Mean | Std. Dev. | Observations |
| R 0 - R 399 | 0.808 | 0.394 | 2700 |
| R 400 – R 799 | 0.835 | 0.371 | 3349 |
| R 800 – R 1 199 | 0.839 | 0.368 | 1680 |
| R 1 200 – R 1 799 | 0.849 | 0.358 | 997 |
| R 1 800 – R 2 499 | 0.817 | 0.387 | 710 |
| R 2 500 – R 4 999 | 0.843 | 0.364 | 908 |
| R 5 000 – R 9 999 | 0.878 | 0.328 | 522 |
| R 10 000 or more | 0.899 | 0.302 | 214 |
| Total | 0.833 | 0.373 | 11080 |

Source: GHS 2003

The progressive fee structure for health services is evident from Table 8: a noticeably smaller proportion of those who report low household expenditure paid for their health worker consultation. However, according to Table 9 those in the bottom expenditure categories are

less likely to have access to doctors and are thus consuming a less costly medical service. Utilization of doctors is far below their expected values for the two lowest expenditure categories. Table 10 shows that only the bottom two expenditure groups consume a greater than proportional share of public health services.

| TABLE 8: Payment for health worker consultation, 2003 | | | |
|--|-------------|------------------|---------------------|
| Expenditure category | Mean | Std. Dev. | Observations |
| R 0 - R 399 | 0.42 | 0.49 | 2108 |
| R 400 – R 799 | 0.48 | 0.50 | 2746 |
| R 800 – R 1 199 | 0.51 | 0.50 | 1458 |
| R 1 200 – R 1 799 | 0.56 | 0.50 | 854 |
| R 1 800 – R 2 499 | 0.59 | 0.49 | 620 |
| R 2 500 – R 4 999 | 0.74 | 0.44 | 807 |
| R 5 000 – R 9 999 | 0.86 | 0.35 | 444 |
| R 10 000 or more | 0.84 | 0.37 | 170 |
| Total | 0.54 | 0.50 | 9207 |

Source: GHS 2003

| TABLE 9: Cross-tabulation of type of health worker consulted by expenditure category, 2003 | | |
|---|---------------------------|--------------|
| <i>Italics represents expected value</i> | Doctor | Total |
| R 0 - R 399 | 445 755 <i>574 476</i> | 1 007454 |
| R 400 – R 799 | 601 928 <i>688 365</i> | 1 207179 |
| R 800 – R 1 199 | 367 372 <i>365 126</i> | 640 318 |
| R 1 200 – R 1 799 | 232 059 <i>205 252</i> | 359 949 |
| R 1 800 – R 2 499 | 174 634 <i>149 685</i> | 262 501 |
| R 2 500 – R 4 999 | 274 692 <i>203 446</i> | 356 781 |
| R 5 000 – R 9 999 | 190 517 <i>133 959</i> | 234 922 |
| R 10 000 or more | 96 564 <i>63 212</i> | 110 855 |
| Total | 2 383 521 | 4179 959 |
| Pearson chi2 (4): Pr = 0.000 | | |

Source: GHS 2003

TABLE 10: Place of consultation by expenditure category, 2003

| <i>Italics represents expected value</i> | Public hospital | Public clinic | Private hospital | Private clinic | Private doctor | Total |
|--|---------------------------|---------------------------|-------------------------|-------------------------|---------------------------|------------------|
| R 0 - R 399 | 197 227 <i>194 919</i> | 515 931 <i>389 096</i> | 20 938 <i>44 313</i> | 17 816 <i>26 742</i> | 235 961 <i>321 767</i> | 1 006 890 |
| R 400 – R 799 | 262 067 <i>233 860</i> | 556 879 <i>466 829</i> | 37 639 <i>53 166</i> | 17 007 <i>32 085</i> | 301 458 <i>386 049</i> | 1 208 045 |
| R 800 – R 1 199 | 115 340 <i>123 369</i> | 265 278 <i>246 267</i> | 20 323 <i>28 047</i> | 17 391 <i>16 926</i> | 197 612 <i>203 653</i> | 637 282 |
| R 1 200 – R 1 799 | 73 771 <i>69 681</i> | 122 023 <i>139 096</i> | 18 038 <i>15 841</i> | 10 557 <i>9 560</i> | 123 403 <i>115 027</i> | 359 949 |
| R 1 800 – R 2 499 | 55 190 <i>50 759</i> | 68 494 <i>101 325</i> | 13 939 <i>11 540</i> | 9 790 <i>6 964</i> | 106 007 <i>83 792</i> | 262 205 |
| R 2 500 – R 4 999 | 67 009 <i>68 995</i> | 58 498 <i>137 728</i> | 31 470 <i>15 686</i> | 20 589 <i>9 466</i> | 162 379 <i>113 895</i> | 356 407 |
| R 5 000 – R 9 999 | 29 580 <i>45 478</i> | 20 569 <i>90 782</i> | 25 223 <i>10 339</i> | 13 290 <i>6 239</i> | 134 886 <i>75 073</i> | 234 922 |
| R 10 000 or more | 8 370 <i>21 494</i> | 6 355 <i>42 906</i> | 16 248 <i>4 887</i> | 4 491 <i>2 949</i> | 73 031 <i>35 482</i> | 111 031 |
| Total | 808 554 | 1 614 027 | 183 818 | 110 931 | 1 334 737 | 4 176 731 |
| Pearson chi2 (4): Pr = 0.000 | | | | | | |

Source: GHS 2003

According to Table 11 below there does not appear to be any noteworthy differences in the share of rural and urban residents that chose to consult a health worker when they were ill. Their respective shares of public hospital utilization are also close.

| TABLE 11: Health worker consultation when ill by area, 2003 | | | |
|--|--------------|------------------|---------------------|
| Area | Mean | Std. Dev. | Observations |
| Urban | 0.839 | 0.368 | 6 719 |
| Rural | 0.832 | 0.374 | 4 735 |
| Total | 0.836 | 0.370 | 11 454 |

Source: GHS 2003

| TABLE 12: Public Hospital utilization by area, 2003 | | | |
|--|--------------|------------------|---------------------|
| Area | Mean | Std. Dev. | Observations |
| Urban | 0.019 | 0.14 | 53 534 |
| Rural | 0.018 | 0.13 | 45 894 |
| Total | 0.018 | 0.13 | 99 428 |

Source: GHS 2003

1.3 SUBSIDISING HEALTH SERVICES

To enable a comparison of health subsidies for different groups an average expenditure per hospital visit is calculated for each group. The average expenditure per visit is estimated by multiplying the proportion of households that paid for their visit to the hospital (from GHS 2003) with the average hospital expenditure for those households that reported expenditure on public hospitals (from IES 2000).⁹ The use of average reported expenditure will mean that systematic differences between groups in the use of hospitals will also be captured by this

⁹ Note that the expenditure category in the IES 2000 is defined as "Hospitals, nursing-homes, clinics, etc., including ambulance services". The category thus also includes non-hospital health expenditure.

method. For each individual the average expenditure per hospital visit is then subtracted from the hospital cost per visit for the province where he or she resides to estimate the government transfer or subsidy for each of the individuals who utilized hospital services. An average subsidy for the group is calculated by multiplying the group's average subsidy per visit with the proportion of the group that reported utilizing hospital services during the previous month (GHS 2003).

As expected, the analysis demonstrates that on average those in the bottom expenditure groups pay less for their use of public hospitals. The estimated average subsidy varies between R 533 and R 812 with the six bottom expenditure groups all receiving close to R 800. Public hospital use is considerably lower for the top two expenditure groups, resulting in a substantially smaller average subsidy for these two groups.

TABLE 13: Average subsidy per expenditure category, 2000

| Expenditure categories | For those who visited public hospital | | | | For whole category | |
|------------------------|---------------------------------------|----------------------|---------------------|-----------------|--|-----------------|
| | Average expenditure if paid | Proportion that paid | Average expenditure | Average subsidy | Proportion of group who used public hospital | Average subsidy |
| R 0 - R 399 | 48.33 | 0.42 | 20.48 | 801.73 | 0.019 | 15.09 |
| R 400 – R 799 | 48.58 | 0.48 | 23.28 | 800.61 | 0.018 | 14.76 |
| R 800 – R 1 199 | 69.66 | 0.51 | 35.85 | 812.02 | 0.018 | 14.84 |
| R 1 200 – R 1 799 | 89.39 | 0.56 | 50.00 | 768.75 | 0.018 | 13.46 |
| R 1 800 – R 2 499 | 98.25 | 0.59 | 57.85 | 791.71 | 0.021 | 16.59 |
| R 2 500 – R 4 999 | 141.96 | 0.74 | 104.79 | 757.18 | 0.019 | 14.65 |
| R 5 000 – R 9 999 | 308.67 | 0.86 | 264.41 | 596.60 | 0.014 | 8.57 |
| R 10 000 or more | 389.11 | 0.84 | 325.52 | 533.42 | 0.007 | 3.80 |
| Total | 100.95 | 0.54 | 54.38 | 785.55 | 0.018 | 14.29 |

Source: DoH's National Hospital data base, Expenditure per hospital data base, GHS 2003, IES 2000

Notes: Ratios for proportion that paid applies to all individuals who consulted health workers due to small cell size when including only those who visited public hospital

Hospital visits are here approximated using health expenditure. A hospital visit is assumed if the household's expenditure on public exceeded zero

2. EQUITY OF SERVICE DELIVERY AND QUALITY

Average satisfaction with health services is lower among the lowest expenditure groups. The values for the satisfaction variable range from 1 to 5, with 1 representing “very satisfied” and 5 “very dissatisfied”. There are noteworthy differences in the approval levels of the four race groups with black levels substantially lower than that of whites. There are however no significant differences in the average satisfaction of rural and urban residents.

Users of public health facilities generally have lower levels of satisfaction than users of private facilities. Public hospital users cited long waiting times (36% of users) and unavailable drugs (8% of users) as problems.

| TABLE 14: Average satisfaction with health services by expenditure group, 2003 | | | |
|---|-------------|------------------|---------------------|
| Population group | Mean | Std. Dev. | Observations |
| R 0 - R 399 | 1.60 | 1.13 | 2 109 |
| R 400 – R 799 | 1.65 | 1.15 | 2 746 |
| R 800 – R 1 199 | 1.63 | 1.10 | 1 459 |
| R 1 200 – R 1 799 | 1.64 | 1.15 | 853 |
| R 1 800 – R 2 499 | 1.46 | 0.96 | 623 |
| R 2 500 – R 4 999 | 1.43 | 1.02 | 807 |
| R 5 000 – R 9 999 | 1.35 | 0.96 | 444 |
| R 10 000 or more | 1.24 | 0.66 | 170 |
| Total | 1.57 | 1.10 | 9 211 |

Source: GHS 2003

* Note that a higher score here indicates greater dissatisfaction

| TABLE 15: Average satisfaction with health services by population group, 2003 | | | |
|--|-------------|------------------|---------------------|
| Population group | Mean | Std. Dev. | Observations |
| Black | 1.61 | 1.13 | 7 558 |
| Coloured | 1.45 | 0.94 | 885 |
| Indian | 1.49 | 1.03 | 183 |
| White | 1.25 | 0.79 | 916 |
| Total | 1.56 | 1.09 | 9 542 |

Source: GHS 2003

* Note that a higher score here indicates greater dissatisfaction

| TABLE 16: Average satisfaction with health services by area, 2003 | | | |
|--|-------------|------------------|---------------------|
| Population group | Mean | Std. Dev. | Observations |
| Urban | 1.559 | 1.097 | 5 628 |
| Rural | 1.564 | 1.076 | 3 920 |
| Total | 1.561 | 1.089 | 9 548 |

Source: GHS 2003

The reasons given for not consulting a health worker vary by expenditure category and provide an indication of factors constraining use for the different expenditure groups. In addition to having a higher likelihood of consulting a health worker in case of illness, in most cases when individuals in the top expenditure brackets chose to not consult a health worker it was because the illness did not necessitate it. Table 17 shows that those in the bottom expenditure categories are considerably more likely than those in the top brackets to cite distance to the health facility and prohibitive costs as reasons for not consulting a health worker. In the bottom expenditure group more than a third claimed health costs to be prohibitive, while 14% said that the traveling distance to the facility prevented them from consulting a health worker.

Travel time appears to be an important consideration for rural residents when making decisions about medical care. According to Table 18 the number of rural residents reporting

that they decided to not consult a health worker because the facility was “too far away” is much higher than the that for urban workers. Tables 19 and 20 also show that the average travel time to the closest clinic or hospital was considerably higher for rural residents and that they were also less likely to consult doctors than urban residents.

| TABLE 17: Reasons for not consulting health worker during the previous month by expenditure category, 2003 | | | | |
|---|--------------------------|-------------------------|---------------------------|--------------|
| <i>Italics represents expected value</i> | Too expensive | Too far away | Not necessary | Total |
| R 0 - R 399 | 78 870 <i>70 254</i> | 29 290 <i>18 986</i> | 96 316 <i>115 236</i> | 204 476 |
| R 400 – R 799 | 69 199 <i>72 253</i> | 24 645 <i>19 527</i> | 116 450 <i>118 514</i> | 210 294 |
| R 800 – R 1 199 | 38 547 <i>36 363</i> | 7 271 <i>9 827</i> | 60 016 <i>59 644</i> | 105 834 |
| R 1 200 – R 1 799 | 18 303 <i>17 681</i> | 1 920 <i>4 779</i> | 31 239 <i>29 002</i> | 51 462 |
| R 1 800 – R 2 499 | 17 135 <i>16 976</i> | 1 943 <i>4 588</i> | 30 331 <i>27 845</i> | 49 409 |
| R 2 500 – R 4 999 | 15 304 <i>19 708</i> | 1 047 <i>5 326</i> | 41 010 <i>32 327</i> | 57 361 |
| R 5 000 – R 9 999 | 4 733 <i>8 937</i> | 366 <i>2 415</i> | 20 913 <i>14 660</i> | 26 012 |
| R 10 000 or more | 3 907 <i>3 826</i> | 0 <i>1 034</i> | 7 228 <i>6 275</i> | 11 135 |
| Total | 245 998 | 66 482 | 403 503 | 715 983 |
| Pearson chi2 (4): Pr = 0.000 | | | | |

Source: GHS 2003

| TABLE 18: Reasons for not consulting health worker during the previous month by area, 2003 | | | | |
|---|---------------------------|-------------------------|---------------------------|--------------|
| <i>Italics represents expected value</i> | Too expensive | Too far away | Not necessary | Total |
| Urban | 125 372 <i>144 370</i> | 5 941 <i>38 809</i> | 295 604 <i>243 738</i> | 426 917 |
| Rural | 123 124 <i>104 126</i> | 60 859 <i>27 991</i> | 123 929 <i>175 795</i> | 307 912 |
| Total | 248 496 | 66 800 | 419 533 | 734 829 |
| Pearson chi2 (4): Pr = 0.000 | | | | |

Source: GHS 2003

| TABLE 19: Time to travel to closest hospital or clinic by area, 2003 | | | |
|---|-------------|------------------|---------------------|
| Population group | Mean | Std. Dev. | Observations |
| Urban | 17.84 | 11.47 | 53 421 |
| Rural | 33.57 | 18.57 | 45 716 |
| Total | 24.94 | 17.00 | 99 137 |

Source: GHS 2003

| TABLE 20: Doctors consulted by area, 2003 <i>(Italics represents expected value)</i> | | |
|--|-------------------------------|---|
| | Doctor | Total number that consulted health workers |
| Urban | 1 774 598 <i>1 505 925</i> | 2 605 131 |
| Rural | 749 764 <i>1 018 437</i> | 1 761 815 |
| Total | 2 524 362 | 4 366 946 |
| Pearson chi2 (9): Pr = 0.000 | | |

CONCLUSION

The analysis shows that public health spending is progressive. Poorer individuals pay lower hospital fees and make more frequent use of public hospitals than those at the top of the expenditure scale, who often prefer to use private hospitals.

Service satisfaction is notably lower for the users of public rather than private health services. The most frequent complaints regarding public hospitals are long waiting times (36% of users) and drugs that are out of stock (9% of users). Dissatisfaction with health services is highest among blacks and those in the lowest expenditure groups.

Access to health facilities also remain an issue: individuals in the bottom expenditure group cite costs (39%) and travel to the health facility (14%) as factors that prevent them from seeking help when they are ill. Although there are no significant differences in the proportion of rural and urban residents that consult health workers when they are ill, urban residents are considerably more likely to see doctors.

APPENDIX 3:

HOUSING SUBSIDIES AND FREE BASIC WATER

Andries Mouton, working with Janine Thorne

Development Bank of Southern Africa

Housing subsidy information:

I had a meeting with Lenie Visser (DOH) to discuss detail and to clarify information provided by Dept of Housing DBSA. Information is depicted on a provincial level for individual years from 1994/95 to 2003/2004 and includes the following:

- Expenditure on housing subsidies
- Number of subsidies
- Beneficiaries per income group

Free Basic Water information:

I had a meeting with Wessel Steyn of DWAF which focused on technical detail e.g. cost of providing free water. DWAF says it has not quantified the cost associated with free basic water since it a complicated issue and various factors influence the cost of providing free basic water (see notes)

Only cumulative information up to March 2004 is available: Information is depicted on a provincial level and includes the following:

- Population and estimated number of households served
- Poor population and estimated number of poor households served
- Estimated expenditure n free basic water.

Free Basic Electricity:

I engaged in an exercise to obtain information on free basic electricity by contacting the following institutions and persons:

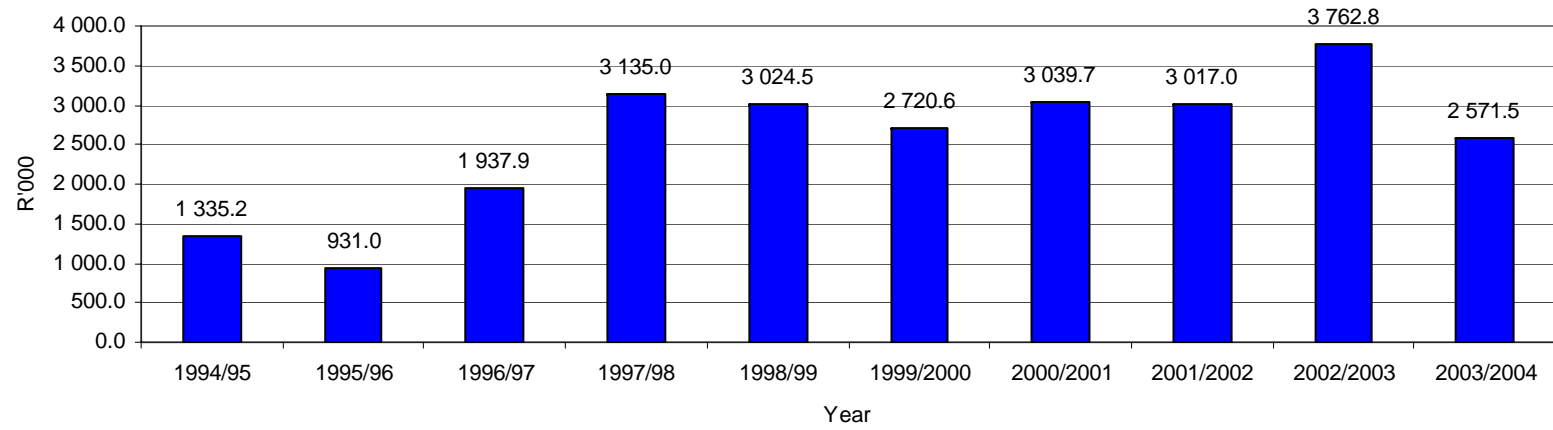
- National Electricity Regulator: Lesley Ferrando: She informed me that NER currently has no information available and will attempt to gather the information from Local Authorities when the municipalities have to submit annual information to the NER. Submissions are only due in Nov 2004 whereupon the NER will capture the free basic electricity information in a database. From the discussion I had with her, it seems that ESKOM and the Municipalities have to iron out financial problems before the implementation of the programme can start in all earnest. She referred me to ESKOM.

- ESKOM. I had contact with Dannie van der Walt who in turn referred me to Department of Mineral and Energy Affairs. David Mahuna's Office who was responsible for the drafting of the Free Basic Electricity Guideline informed that the specific department is only responsible for the policy issues and that I should contact DPLG for statistical information.
- I contacted DPLG (Patrick Flusk's office) who will return my call, since no one was available to assist me. To date DPLG has not yet responded to my request, but it seems (from hearsay) that many problems still exist with regards to the implementation of free basic electricity and that very little (if any) information is available. I will inform you if DPLG does respond but in the meantime it must be assumed that the required information does not currently exist.

HOUSING

| | SUMMARY: PROVINCIAL EXPENDITURE | | | | | | | | | | |
|-----------------|--|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|-----------------|
| Province | R'000m | R'000m | R'000m | R'000m | R'000m | R'000m | R'000m | R'000m | R'000m | R'000m | R'000m |
| | 1994/95 | 1995/96 | 1996/97 | 1997/98 | 1998/99 | 1999/2000 | 2000/2001 | 2001/2002 | 2002/2003 | 2003/2004 | TOTAL |
| | | | | | | | | | | Up to Dec | April |
| | | | | | | | | | | 2003 | 1994 to |
| | | | | | | | | | | | Dec 2003 |
| Eastern Cape | 60.5 | 64.3 | 133.0 | 274.3 | 387.1 | 325.2 | 471.4 | 293.2 | 465.0 | 456.4 | 2 930.4 |
| Free State | 103.2 | 49.3 | 202.3 | 138.2 | 192.0 | 204.8 | 304.3 | 146.3 | 191.5 | 310.7 | 1 842.6 |
| Gauteng | 400.4 | 346.9 | 567.9 | 790.8 | 797.6 | 796.5 | 614.2 | 576.2 | 1 041.3 | 390.5 | 6 322.3 |
| KwaZulu/Natal | 303.4 | 140.6 | 335.3 | 842.7 | 600.1 | 461.8 | 558.4 | 664.3 | 748.1 | 620.0 | 5 274.7 |
| Limpopo | 21.7 | 17.3 | 111.2 | 189.8 | 239.4 | 202.0 | 270.2 | 417.5 | 408.9 | 272.2 | 2 150.2 |
| Mpumalanga | 69.5 | 77.6 | 175.5 | 168.4 | 108.3 | 105.1 | 171.8 | 250.5 | 269.2 | 221.9 | 1 617.8 |
| Northern Cape | 54.9 | 48.2 | 53.5 | 74.7 | 70.9 | 62.7 | 63.8 | 65.5 | 68.9 | 63.3 | 626.4 |
| North West | 37.5 | 30.1 | 124.0 | 263.9 | 221.4 | 181.4 | 261.3 | 275.4 | 221.7 | 80.6 | 1 697.3 |
| Western Cape | 284.1 | 156.7 | 235.2 | 392.2 | 407.7 | 381.1 | 324.3 | 328.1 | 348.2 | 155.9 | 3 013.5 |
| Total | 1 335.2 | 931.0 | 1 937.9 | 3 135.0 | 3 024.5 | 2 720.6 | 3 039.7 | 3 017.0 | 3 762.8 | 2 571.5 | 25 475.2 |

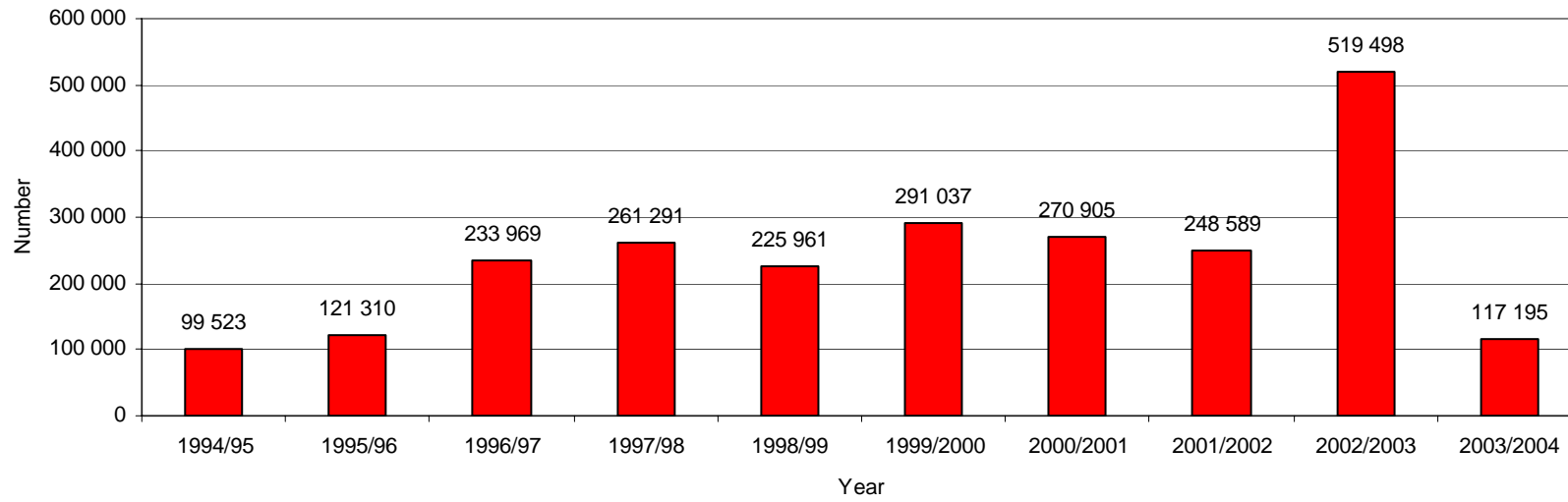
Expenditure on housing subsidies; 1994/95 to Dec 03



Housing Subsidies approved April 1994 to Dec 2003

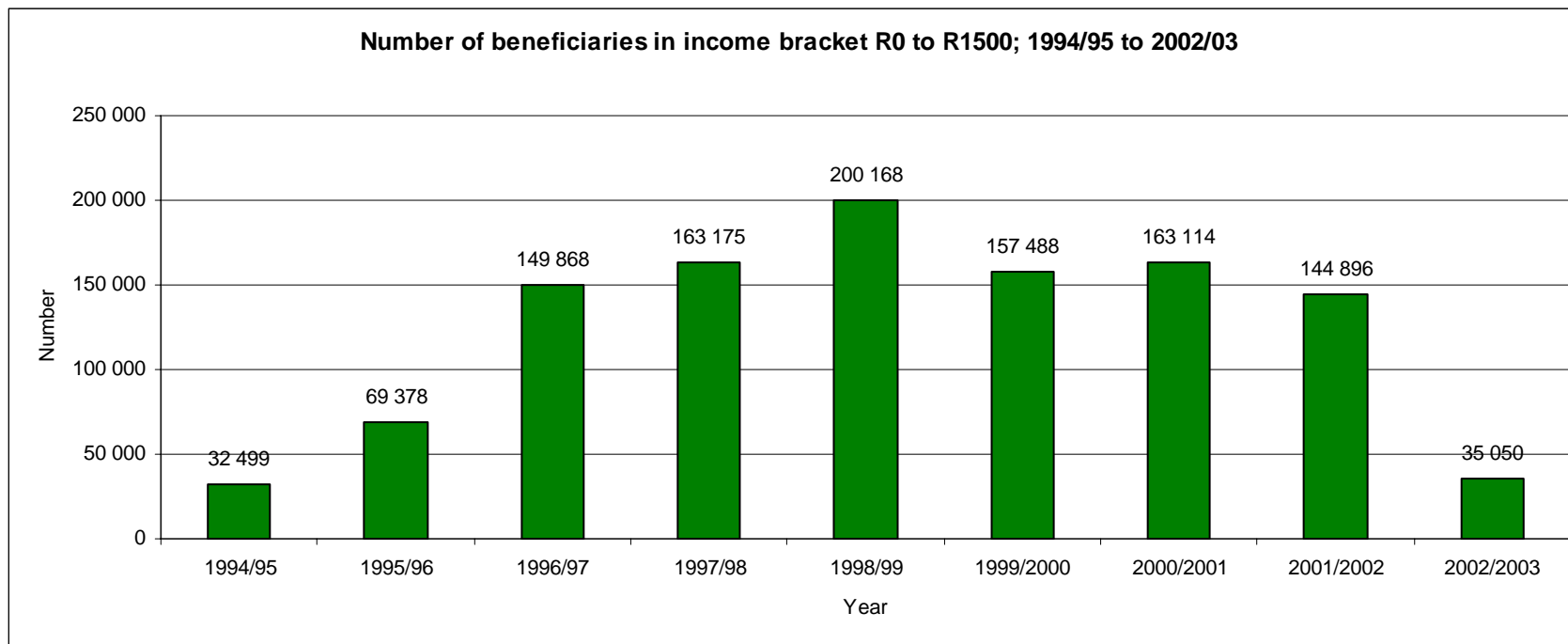
| Province | 1994/95 | 1995/96 | 1996/97 | 1997/98 | 1998/99 | 1999/2000 | 2000/2001 | 2001/2002 | 2002/2003 | 2003/2004 to Dec 03 | Total April 94 to Dec 03 | 2003/2004 |
|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|------------------------|--------------------------------|----------------|
| Eastern Cape | 0 | 19 357 | 28 581 | 34 235 | 33 071 | 28 614 | 31 105 | 38 146 | 10 849 | 18 411 | 242 369 | 20 811 |
| Free State | 2 048 | 20 439 | 7 210 | 4 017 | 11 600 | 16 818 | 13 564 | 8 799 | 17 510 | 5 081 | 107 086 | 5 681 |
| Gauteng | 56 691 | 17 051 | 75 462 | 68 527 | 104 446 | 111 623 | 65 877 | 84 907 | 404 432 | 13 926 | 1 002 942 | 39 086 |
| KwaZulu/Natal | 17 111 | 24 065 | 33 845 | 50 339 | 30 664 | 33 806 | 24 384 | 27 801 | 23 437 | 42 829 | 308 281 | 43 397 |
| Limpopo | 3 193 | 5 450 | 9 794 | 10 929 | 13 625 | 34 727 | 28 805 | 8 115 | 16 506 | 15 764 | 146 908 | 15 764 |
| Mpumalanga | 3 565 | 8 368 | 17 483 | 11 756 | 3 746 | 19 345 | 38 621 | 42 748 | 7 861 | 2 191 | 155 684 | 2 341 |
| Northern Cape | 1 797 | 2 707 | 5 275 | 11 322 | 2 880 | 3 990 | 4 010 | 3 109 | 4 161 | 7 003 | 46 254 | 7 452 |
| North West | 13 381 | 10 429 | 34 987 | 25 429 | 9 579 | 9 054 | 38 962 | 3 107 | 1 790 | 4 247 | 150 965 | 7 570 |
| Western Cape | 1 737 | 13 444 | 21 332 | 44 737 | 16 350 | 33 060 | 25 577 | 31 857 | 32 952 | 7 743 | 228 789 | 8 143 |
| Total | 99 523 | 121 310 | 233 969 | 261 291 | 225 961 | 291 037 | 270 905 | 248 589 | 519 498 | 117 195 | 2 389 278 | 150 245 |

Housing subsidies approved; 1994/95 to Dec 03



Number of beneficiaries: Income bracket R0 to R1500:April 1994 to March 2003

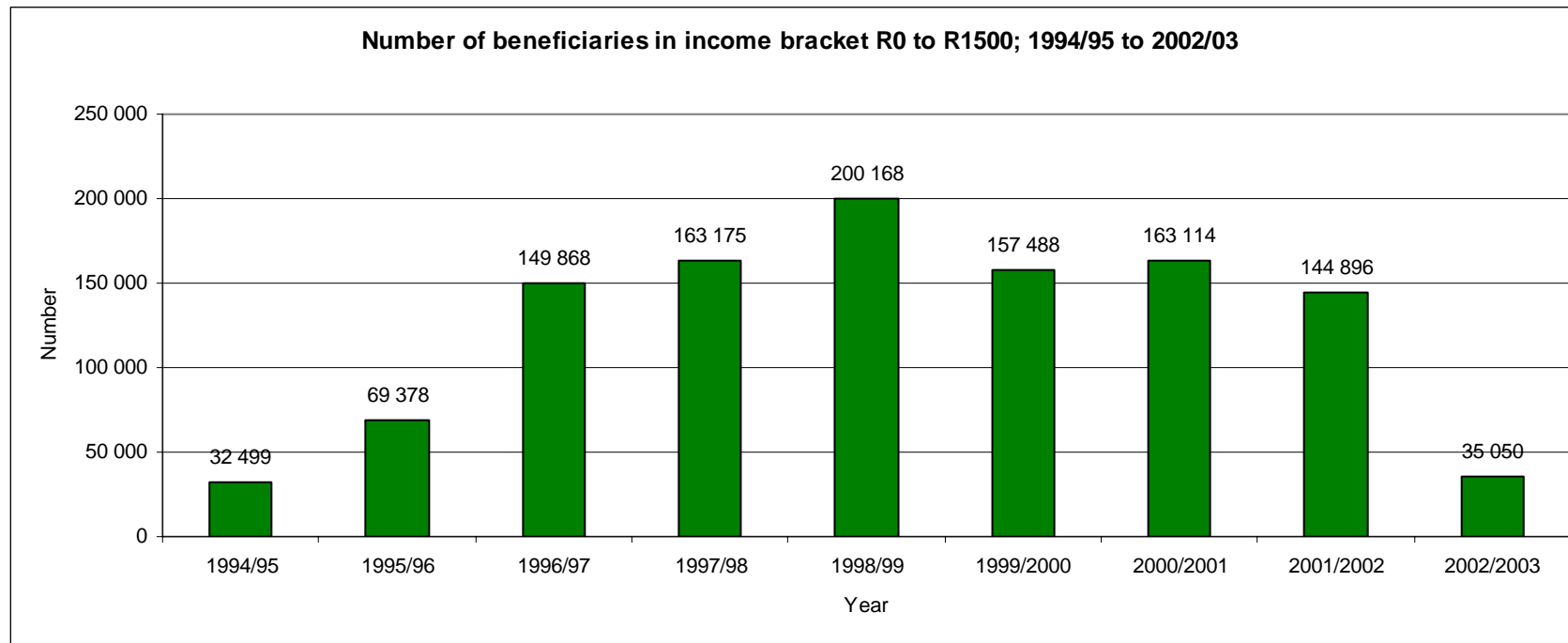
| Province | 1994/95 | 1995/96 | 1996/97 | 1997/98 | 1998/99 | 1999/2000 | 2000/2001 | 2001/2002 | 2002/2003 | 2003/2004 | TOTAL |
|-----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Eastern Cape | 980 | 1 338 | 18 015 | 35 058 | 21 097 | 18 018 | 25 412 | 44 926 | 7 375 | na | 172 219 |
| Free State | 1 029 | 10 078 | 12 570 | 7 856 | 12 286 | 18 002 | 7 360 | 9 646 | 10 259 | na | 89 086 |
| Gauteng | 1 335 | 7 836 | 21 882 | 35 219 | 70 388 | 40 212 | 28 968 | 30 933 | 5 329 | na | 242 102 |
| KwaZulu/Natal | 24 214 | 20 152 | 44 275 | 19 932 | 25 834 | 12 562 | 16 493 | 2 964 | 4 380 | na | 170 806 |
| Limpopo | 106 | 2 536 | 6 269 | 14 752 | 19 180 | 15 240 | 20 154 | 9 821 | 465 | na | 88 523 |
| Mpumalanga | 1 417 | 9 652 | 11 810 | 8 886 | 7 336 | 11 047 | 24 631 | 5 246 | 2 744 | na | 82 769 |
| Northern Cape | 148 | 841 | 6 744 | 5 745 | 4 423 | 3 683 | 2 981 | 1 547 | 175 | na | 26 287 |
| North West | 1 947 | 8 188 | 13 756 | 9 225 | 10 318 | 19 789 | 15 438 | 13 570 | 2 055 | na | 94 286 |
| Western Cape | 1 323 | 8 757 | 14 547 | 26 502 | 29 306 | 18 935 | 21 677 | 26 243 | 2 268 | na | 149 558 |
| Total | 32 499 | 69 378 | 149 868 | 163 175 | 200 168 | 157 488 | 163 114 | 144 896 | 35 050 | na | 1 115 636 |



Number of beneficiaries: Income bracket R0 to R1500: April 1994 to March 2003

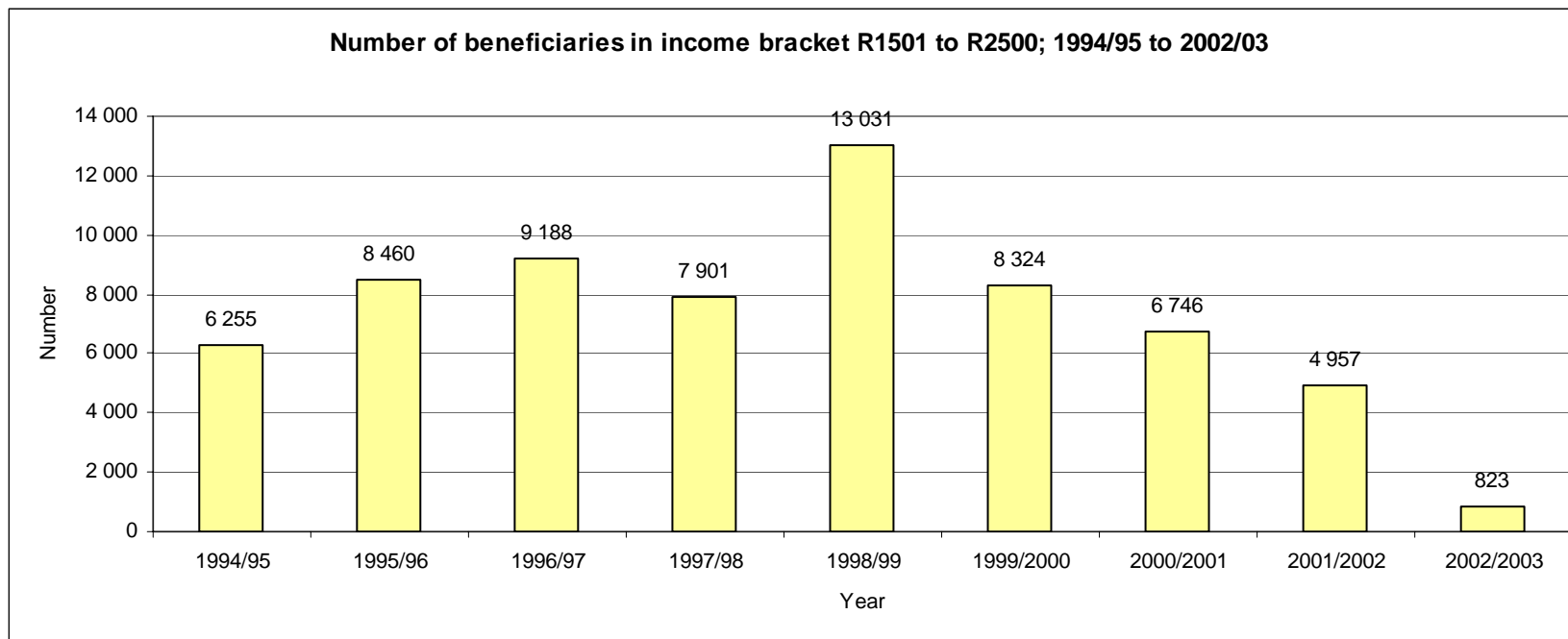
| Province | 1994/95 | 1995/96 | 1996/97 | 1997/98 | 1998/99 | 1999/2000 | 2000/2001 | 2001/2002 | 2002/2003 | 2003/2004 | TOTAL |
|---------------|---------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|----------------|
| Eastern Cape | 980 | 1 338 | 18 015 | 35 058 | 21 097 | 18 018 | 25 412 | 44 926 | 7 375 | na | 172 219 |
| Free State | 1 029 | 10 078 | 12 570 | 7 856 | 12 286 | 18 002 | 7 360 | 9 646 | 10 259 | na | 89 086 |
| Gauteng | 1 335 | 7 836 | 21 882 | 35 219 | 70 388 | 40 212 | 28 968 | 30 933 | 5 329 | na | 242 102 |
| KwaZulu/Natal | 24 214 | 20 152 | 44 275 | 19 932 | 25 834 | 12 562 | 16 493 | 2 964 | 4 380 | na | 170 806 |
| Limpopo | 106 | 2 536 | 6 269 | 14 752 | 19 180 | 15 240 | 20 154 | 9 821 | 465 | na | 88 523 |

| | | | | | | | | | | | |
|---------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------|----|------------------|
| Mpumalanga | 1 417 | 9 652 | 11 810 | 8 886 | 7 336 | 11 047 | 24 631 | 5 246 | 2 744 | na | 82 769 |
| Northern Cape | 148 | 841 | 6 744 | 5 745 | 4 423 | 3 683 | 2 981 | 1 547 | 175 | na | 26 287 |
| North West | 1 947 | 8 188 | 13 756 | 9 225 | 10 318 | 19 789 | 15 438 | 13 570 | 2 055 | na | 94 286 |
| Western Cape | 1 323 | 8 757 | 14 547 | 26 502 | 29 306 | 18 935 | 21 677 | 26 243 | 2 268 | na | 149 558 |
| Total | 32 499 | 69 378 | 149 868 | 163 175 | 200 168 | 157 488 | 163 114 | 144 896 | 35 050 | na | 1 115 636 |



Number of beneficiaries: Income bracket R1501 to R2500: April 1994 to March 2003

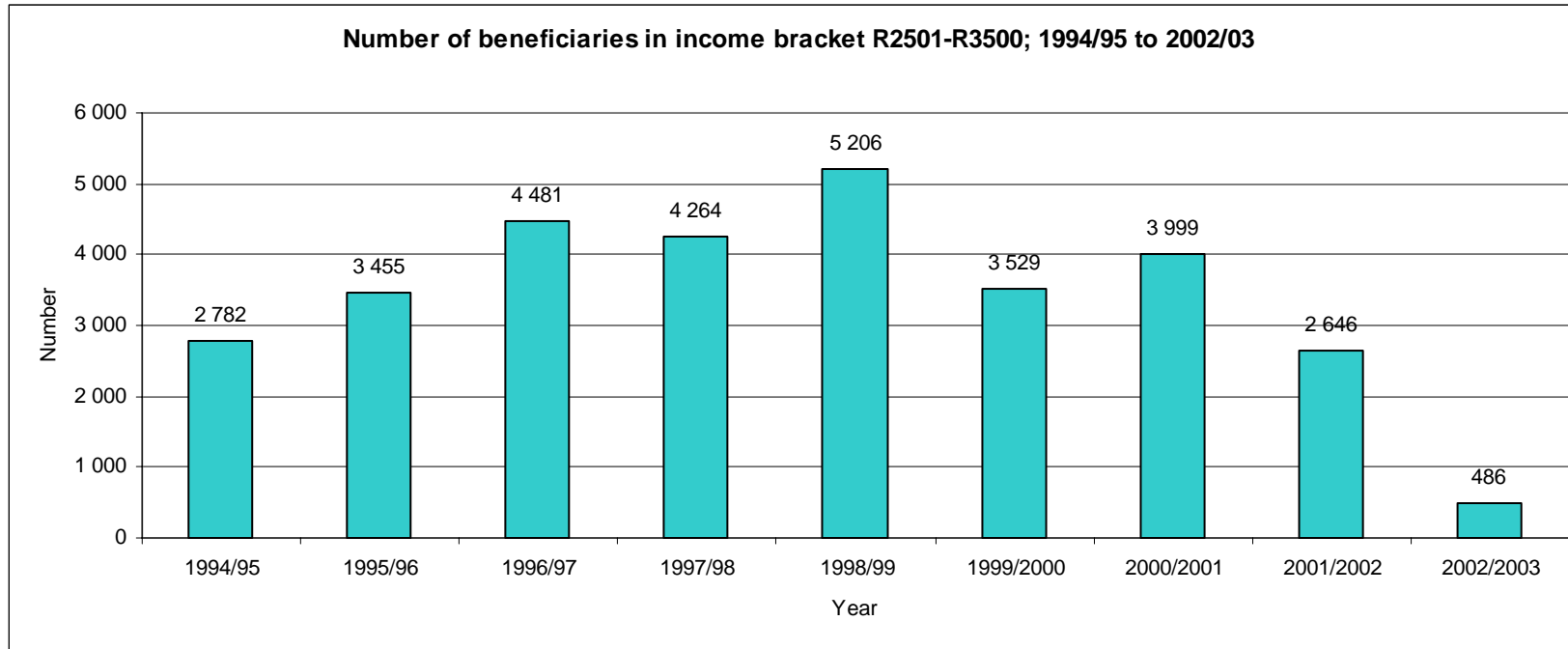
| Province | 1994/95 | 1995/96 | 1996/97 | 1997/98 | 1998/99 | 1999/2000 | 2000/2001 | 2001/2002 | 2002/2003 | 2003/2004 | TOTAL |
|-----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|---------------|
| Eastern Cape | 167 | 726 | 540 | 703 | 535 | 838 | 775 | 1 024 | 121 | na | 5 429 |
| Free State | 166 | 527 | 331 | 501 | 244 | 92 | 34 | 132 | 3 | na | 2 030 |
| Gauteng | 964 | 3 980 | 2 699 | 3 048 | 8 400 | 4 313 | 2 843 | 2 528 | 564 | na | 29 339 |
| KwaZulu/Natal | 4 595 | 786 | 1 724 | 501 | 506 | 286 | 284 | 96 | 33 | na | 8 811 |
| Limpopo | 2 | 24 | 50 | 390 | 606 | 269 | 145 | 36 | 0 | na | 1 522 |
| Mpumalanga | 105 | 456 | 465 | 283 | 203 | 144 | 273 | 92 | 18 | na | 2 039 |
| Northern Cape | 0 | 82 | 213 | 169 | 214 | 164 | 132 | 58 | 4 | na | 1 036 |
| North West | 73 | 565 | 1 282 | 936 | 671 | 1 003 | 809 | 373 | 31 | na | 5 743 |
| Western Cape | 183 | 1 314 | 1 884 | 1 370 | 1 652 | 1 215 | 1 451 | 618 | 49 | na | 9 736 |
| Total | 6 255 | 8 460 | 9 188 | 7 901 | 13 031 | 8 324 | 6 746 | 4 957 | 823 | na | 65 685 |



Number of beneficiaries: Income bracket R2501 to R3500: April 1994 to March 2003

| Province | 1994/95 | 1995/96 | 1996/97 | 1997/98 | 1998/99 | 1999/2000 | 2000/2001 | 2001/2002 | 2002/2003 | 2003/2004 | TOTAL |
|---------------|---------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|---------------|
| Eastern Cape | 53 | 349 | 598 | 572 | 389 | 510 | 547 | 618 | 91 | na | 3 727 |
| Free State | 24 | 114 | 58 | 141 | 66 | 40 | 15 | 72 | 0 | na | 530 |
| Gauteng | 344 | 1 389 | 1 566 | 2 225 | 3 393 | 1 909 | 1 901 | 1 262 | 246 | na | 14 235 |
| KwaZulu/Natal | 2 218 | 412 | 714 | 221 | 230 | 93 | 393 | 58 | 59 | na | 4 398 |
| Limpopo | 2 | 20 | 8 | 73 | 153 | 64 | 27 | 8 | 1 | na | 356 |
| Mpumalanga | 12 | 78 | 149 | 58 | 48 | 43 | 59 | 103 | 24 | na | 574 |
| Northern Cape | 0 | 19 | 47 | 26 | 65 | 59 | 40 | 10 | 0 | na | 266 |

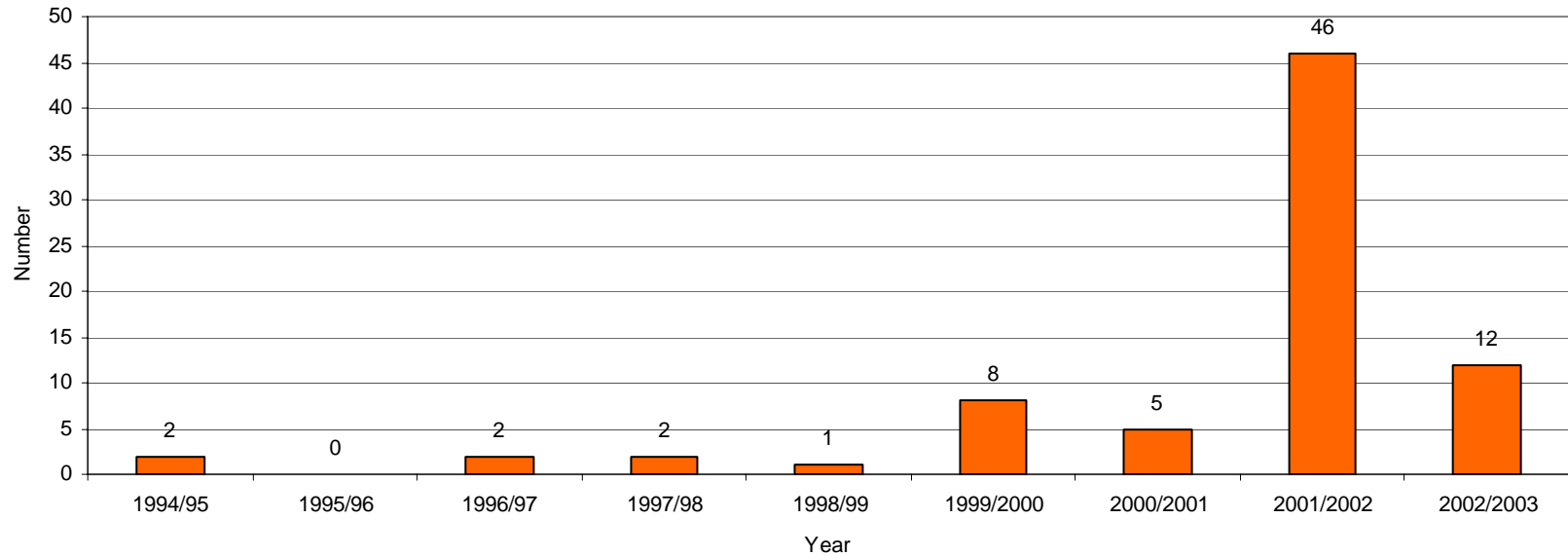
| | | | | | | | | | | | |
|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------------|----|---------------|
| North West | 18 | 190 | 436 | 194 | 122 | 241 | 144 | 142 | 29 | na | 1 516 |
| Western Cape | 111 | 884 | 905 | 754 | 740 | 570 | 873 | 373 | 36 | na | 5 246 |
| Total | 2 782 | 3 455 | 4 481 | 4 264 | 5 206 | 3 529 | 3 999 | 2 646 | 486 | na | 30 848 |



Number of beneficiaries: Income bracket R3501 and more: April 1994 to March 2003

| Province | 1994/95 | 1995/96 | 1996/97 | 1997/98 | 1998/99 | 1999/2000 | 2000/2001 | 2001/2002 | 2002/2003 | 2003/2004 | TOTAL |
|-----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|--------------|
| Eastern Cape | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 1 | na | 5 |
| Free State | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | na | 0 |
| Gauteng | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 24 | 1 | na | 29 |
| KwaZulu/Natal | 0 | 0 | 0 | 2 | 1 | 6 | 0 | 0 | 5 | na | 14 |
| Limpopo | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | na | 2 |
| Mpumalanga | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | na | 0 |
| Northern Cape | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | na | 3 |
| North West | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 15 | 5 | na | 21 |
| Western Cape | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | na | 4 |
| Total | 2 | 0 | 2 | 2 | 1 | 8 | 5 | 46 | 12 | na | 78 |

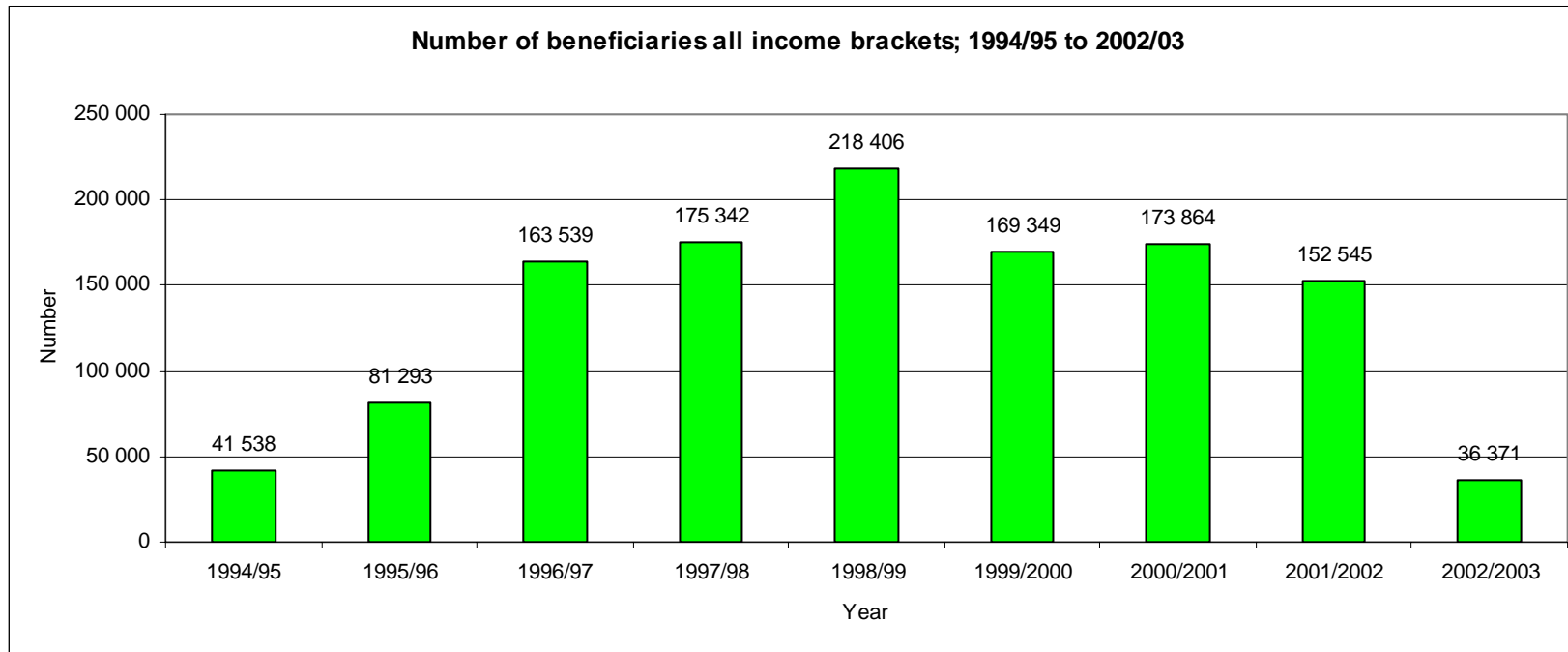
Number of beneficiaries in income bracket R3501 and more; 1994/94 to 2002/03



Number of beneficiaries: Income bracket: ALL: April 1994 to March 2003

| Province | 1994/95 | 1995/96 | 1996/97 | 1997/98 | 1998/99 | 1999/2000 | 2000/2001 | 2001/2002 | 2002/2003 | 2003/2004 | TOTAL |
|---------------|---------|---------|---------|---------|---------|-----------|-----------|-----------|-----------|-----------|----------------|
| Eastern Cape | 1 200 | 2 413 | 19 153 | 36 333 | 22 021 | 19 366 | 26 735 | 46 571 | 7 588 | na | 181 380 |
| Free State | 1 219 | 10 719 | 12 959 | 8 498 | 12 596 | 18 134 | 7 409 | 9 850 | 10 262 | na | 91 646 |
| Gauteng | 2 643 | 13 205 | 26 147 | 40 492 | 82 181 | 46 436 | 33 714 | 34 747 | 6 140 | na | 285 705 |
| KwaZulu/Natal | 31 027 | 21 350 | 46 713 | 20 656 | 26 571 | 12 947 | 17 170 | 3 118 | 4 477 | na | 184 029 |
| Limpopo | 110 | 2 580 | 6 327 | 15 215 | 19 939 | 15 573 | 20 326 | 9 867 | 466 | na | 90 403 |

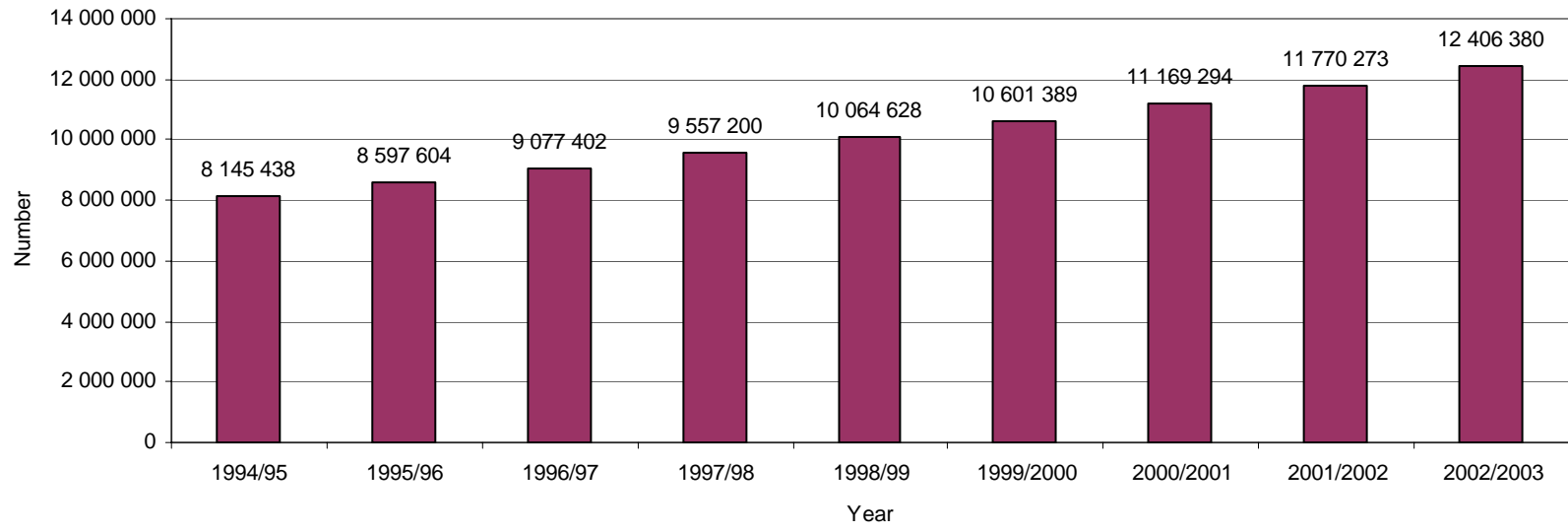
| | | | | | | | | | | | |
|---------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------|----|------------------|
| Mpumalanga | 1 534 | 10 186 | 12 424 | 9 227 | 7 587 | 11 234 | 24 963 | 5 441 | 2 786 | na | 85 382 |
| Northern Cape | 148 | 942 | 7 004 | 5 940 | 4 702 | 3 906 | 3 154 | 1 617 | 179 | na | 27 592 |
| North West | 2 038 | 8 943 | 15 474 | 10 355 | 11 111 | 21 033 | 16 392 | 14 100 | 2 120 | na | 101 566 |
| Western Cape | 1 619 | 10 955 | 17 338 | 28 626 | 31 698 | 20 720 | 24 001 | 27 234 | 2 353 | na | 164 544 |
| Total | 41 538 | 81 293 | 163 539 | 175 342 | 218 406 | 169 349 | 173 864 | 152 545 | 36 371 | na | 1 212 247 |



Number of households:

| Province | 1994/95 | 1995/96 | 1996/97 | 1997/98 | 1998/99 | 1999/2000 | 2000/2001 | 2001/2002 | 2002/2003 | 2003/2004 |
|-----------------|------------------|------------------|------------------|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|
| Eastern Cape | 1 258 609 | 1 295 690 | 1 333 862 | 1 372 034 | 1 411 299 | 1 451 688 | 1 493 232 | 1 535 966 | 1 579 922 | 1 625 136 |
| Free State | 578 807 | 602 104 | 626 339 | 650 574 | 675 747 | 701 893 | 729 052 | 757 261 | 786 561 | 816 996 |
| Gauteng | 1 680 320 | 1 818 294 | 1 967 597 | 2 116 900 | 2 277 533 | 2 450 354 | 2 636 290 | 2 836 334 | 3 051 558 | 3 283 113 |
| KwaZulu/Natal | 1 479 886 | 1 569 857 | 1 665 299 | 1 760 741 | 1 861 652 | 1 968 347 | 2 081 157 | 2 200 432 | 2 326 544 | 2 459 882 |
| Limpopo | 890 378 | 936 236 | 984 457 | 1 032 678 | 1 083 260 | 1 136 321 | 1 191 980 | 1 250 365 | 1 311 611 | 1 375 856 |
| Mpumalanga | 542 786 | 573 101 | 605 110 | 637 119 | 670 820 | 706 305 | 743 666 | 783 004 | 824 422 | 868 032 |
| Northern Cape | 175 650 | 181 525 | 187 596 | 193 667 | 199 935 | 206 405 | 213 085 | 219 981 | 227 101 | 234 450 |
| North West | 634 037 | 676 428 | 721 652 | 766 876 | 814 935 | 866 005 | 920 276 | 977 948 | 1 039 234 | 1 104 361 |
| Western Cape | 904 965 | 944 369 | 985 490 | 1 026 611 | 1 069 447 | 1 114 071 | 1 160 556 | 1 208 982 | 1 259 428 | 1 311 979 |
| Total | 8 145 438 | 8 597 604 | 9 077 402 | 9 557 200 | 10 064 628 | 10 601 389 | 11 169 294 | 11 770 273 | 12 406 380 | 13 079 805 |

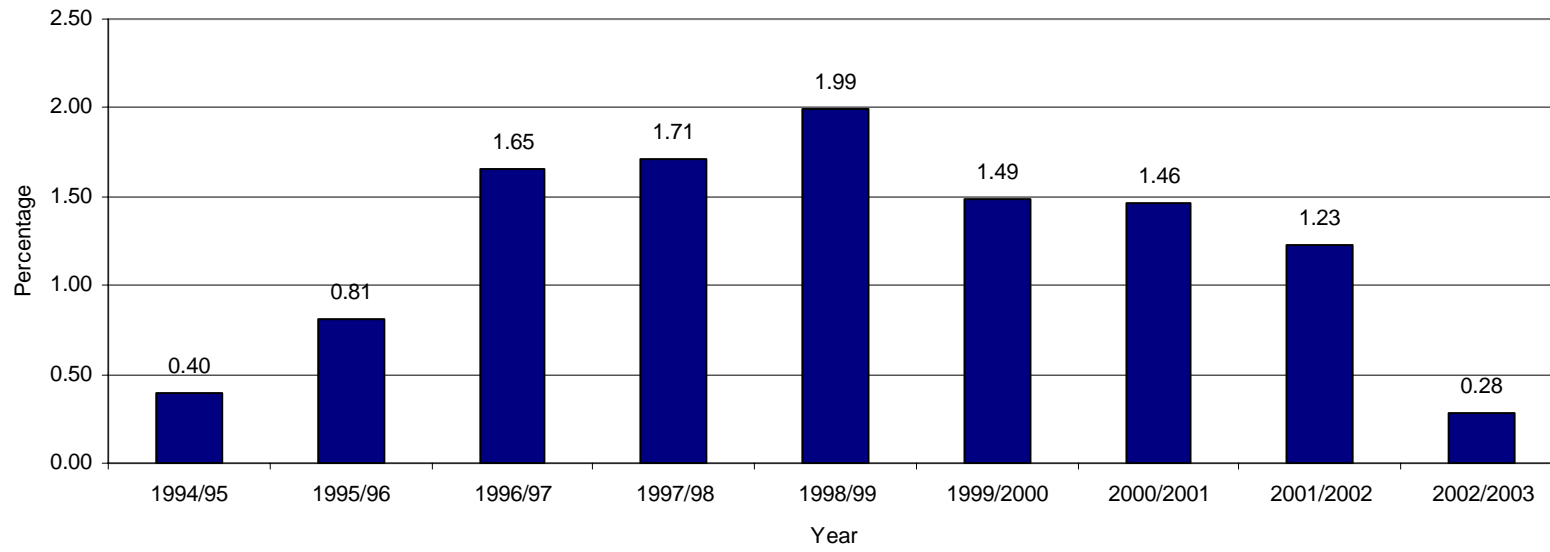
Number of households; 1994/95 to 2003/04 (estimate)



Beneficiaries as % of total households: Income bracket R0 to R1500

| Province | 1994/95 | 1995/96 | 1996/97 | 1997/98 | 1998/99 | 1999/2000 | 2000/2001 | 2001/2002 | 2002/2003 | 2003/2004 |
|-----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|
| Eastern Cape | 0.08 | 0.10 | 1.35 | 2.56 | 1.49 | 1.24 | 1.70 | 2.92 | 0.47 | nc |
| Free State | 0.18 | 1.67 | 2.01 | 1.21 | 1.82 | 2.56 | 1.01 | 1.27 | 1.30 | nc |
| Gauteng | 0.08 | 0.43 | 1.11 | 1.66 | 3.09 | 1.64 | 1.10 | 1.09 | 0.17 | nc |
| KwaZulu/Natal | 1.64 | 1.28 | 2.66 | 1.13 | 1.39 | 0.64 | 0.79 | 0.13 | 0.19 | nc |
| Limpopo | 0.01 | 0.27 | 0.64 | 1.43 | 1.77 | 1.34 | 1.69 | 0.79 | 0.04 | nc |
| Mpumalanga | 0.26 | 1.68 | 1.95 | 1.39 | 1.09 | 1.56 | 3.31 | 0.67 | 0.33 | nc |
| Northern Cape | 0.08 | 0.46 | 3.59 | 2.97 | 2.21 | 1.78 | 1.40 | 0.70 | 0.08 | nc |
| North West | 0.31 | 1.21 | 1.91 | 1.20 | 1.27 | 2.29 | 1.68 | 1.39 | 0.20 | nc |
| Western Cape | 0.15 | 0.93 | 1.48 | 2.58 | 2.74 | 1.70 | 1.87 | 2.17 | 0.18 | nc |

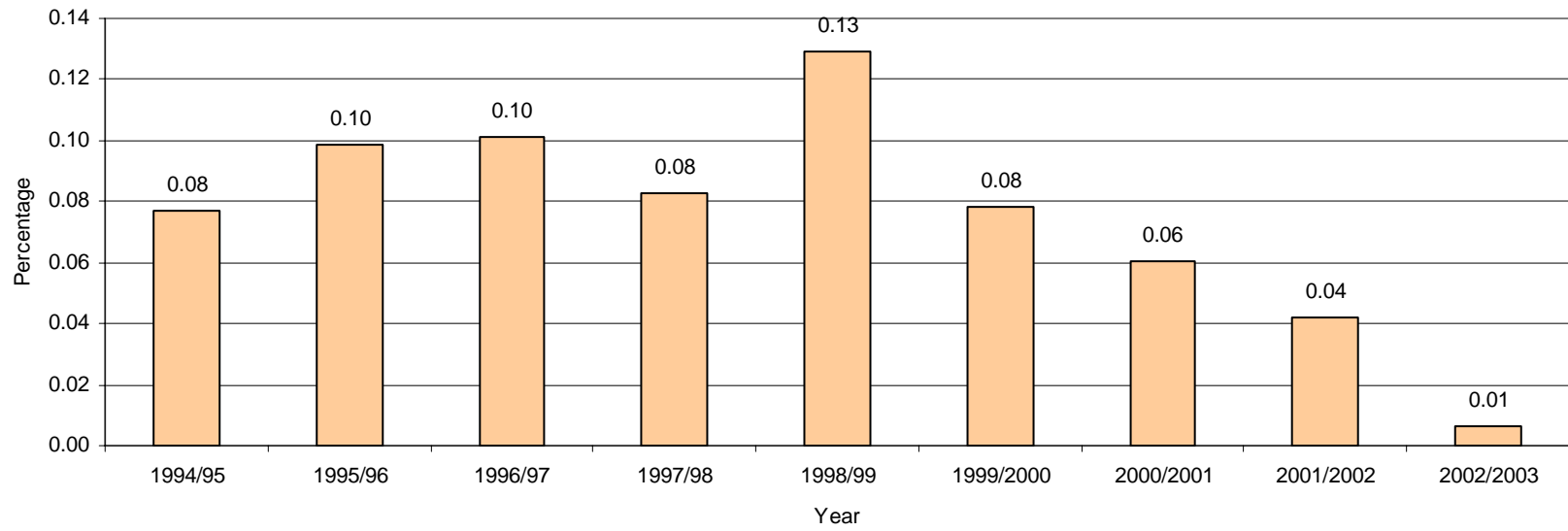
Beneficiaries in income bracket R0 to R1500 as % of households; 1994/95 to 2002/03



Beneficiaries as % of total households: Income bracket R1501 to R2500

| Province | 1994/95 | 1995/96 | 1996/97 | 1997/98 | 1998/99 | 1999/2000 | 2000/2001 | 2001/2002 | 2002/2003 | 2003/2004 |
|-----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|
| Eastern Cape | 0.01 | 0.06 | 0.04 | 0.05 | 0.04 | 0.06 | 0.05 | 0.07 | 0.01 | nc |
| Free State | 0.03 | 0.09 | 0.05 | 0.08 | 0.04 | 0.01 | 0.00 | 0.02 | 0.00 | nc |
| Gauteng | 0.06 | 0.22 | 0.14 | 0.14 | 0.37 | 0.18 | 0.11 | 0.09 | 0.02 | nc |
| KwaZulu/Natal | 0.31 | 0.05 | 0.10 | 0.03 | 0.03 | 0.01 | 0.01 | 0.00 | 0.00 | nc |
| Limpopo | 0.00 | 0.00 | 0.01 | 0.04 | 0.06 | 0.02 | 0.01 | 0.00 | 0.00 | nc |
| Mpumalanga | 0.02 | 0.08 | 0.08 | 0.04 | 0.03 | 0.02 | 0.04 | 0.01 | 0.00 | nc |
| Northern Cape | 0.00 | 0.05 | 0.11 | 0.09 | 0.11 | 0.08 | 0.06 | 0.03 | 0.00 | nc |
| North West | 0.01 | 0.08 | 0.18 | 0.12 | 0.08 | 0.12 | 0.09 | 0.04 | 0.00 | nc |
| Western Cape | 0.02 | 0.14 | 0.19 | 0.13 | 0.15 | 0.11 | 0.13 | 0.05 | 0.00 | nc |
| Total | 0.08 | 0.10 | 0.10 | 0.08 | 0.13 | 0.08 | 0.06 | 0.04 | 0.01 | nc |

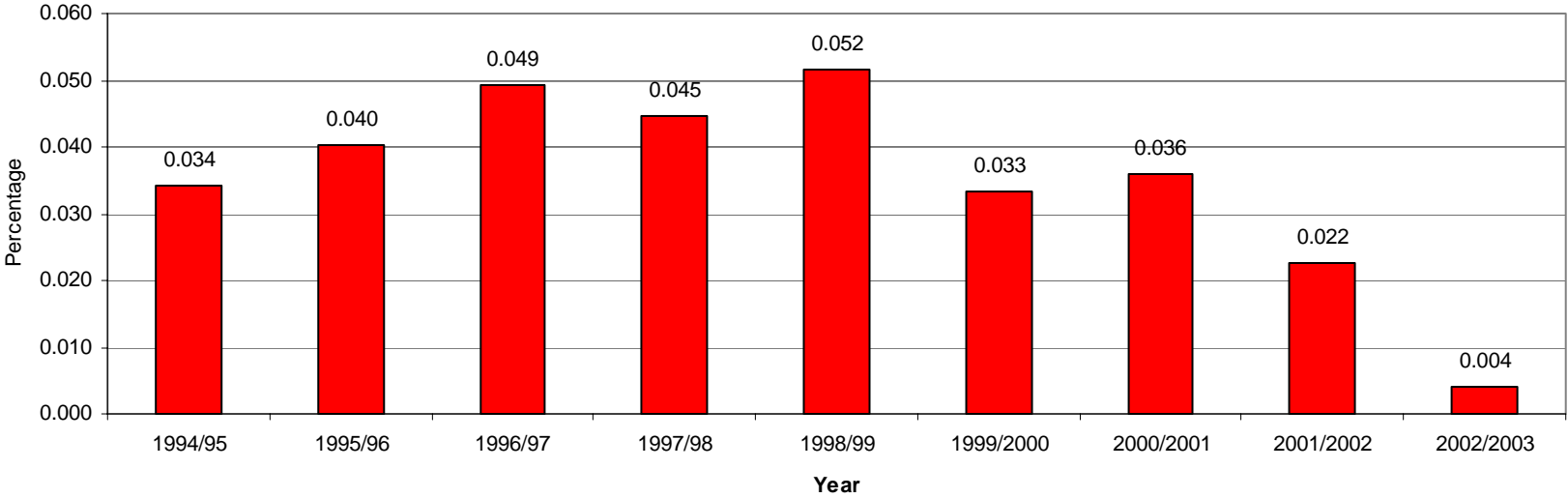
Beneficiaries in income bracket R1500 to R2500 as percentage of households; 1994/95 to 2002/03



Beneficiaries as % of total households: Income bracket R2501 to R3500

| Province | 1994/95 | 1995/96 | 1996/97 | 1997/98 | 1998/99 | 1999/2000 | 2000/2001 | 2001/2002 | 2002/2003 | 2003/2004 |
|-----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|
| Eastern Cape | 0.004 | 0.027 | 0.045 | 0.042 | 0.028 | 0.035 | 0.037 | 0.040 | 0.006 | nc |
| Free State | 0.004 | 0.019 | 0.009 | 0.022 | 0.010 | 0.006 | 0.002 | 0.010 | 0.000 | nc |
| Gauteng | 0.020 | 0.076 | 0.080 | 0.105 | 0.149 | 0.078 | 0.072 | 0.044 | 0.008 | nc |
| KwaZulu/Natal | 0.150 | 0.026 | 0.043 | 0.013 | 0.012 | 0.005 | 0.019 | 0.003 | 0.003 | nc |
| Limpopo | 0.000 | 0.002 | 0.001 | 0.007 | 0.014 | 0.006 | 0.002 | 0.001 | 0.000 | nc |
| Mpumalanga | 0.002 | 0.014 | 0.025 | 0.009 | 0.007 | 0.006 | 0.008 | 0.013 | 0.003 | nc |
| Northern Cape | 0.000 | 0.010 | 0.025 | 0.013 | 0.033 | 0.029 | 0.019 | 0.005 | 0.000 | nc |
| North West | 0.003 | 0.028 | 0.060 | 0.025 | 0.015 | 0.028 | 0.016 | 0.015 | 0.003 | nc |
| Western Cape | 0.012 | 0.094 | 0.092 | 0.073 | 0.069 | 0.051 | 0.075 | 0.031 | 0.003 | nc |
| Total | 0.034 | 0.040 | 0.049 | 0.045 | 0.052 | 0.033 | 0.036 | 0.022 | 0.004 | nc |

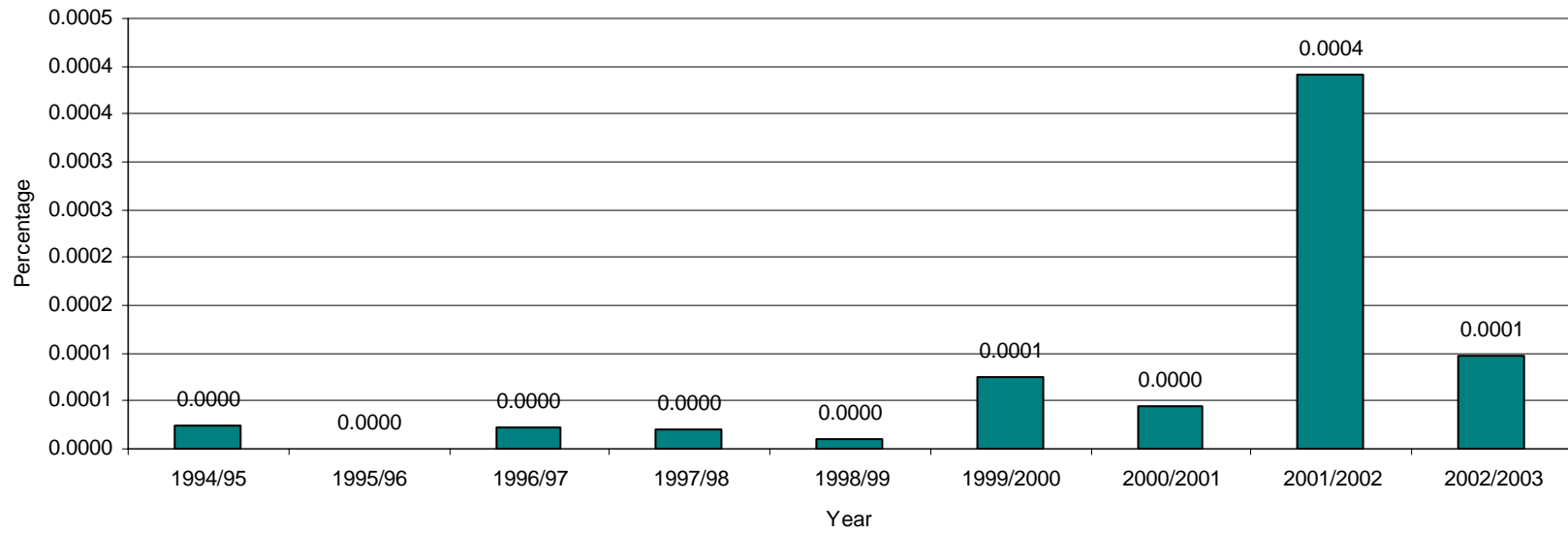
benefiaries in income bracket R2501 to R3500 as % of households; 1994/05 to 2002/03



Beneficiaries as % of total households: Income bracket R3501 and more

| Province | 1994/95 | 1995/96 | 1996/97 | 1997/98 | 1998/99 | 1999/2000 | 2000/2001 | 2001/2002 | 2002/2003 | 2003/2004 |
|-----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|
| Eastern Cape | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0001 | 0.0002 | 0.0001 | nc |
| Free State | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | nc |
| Gauteng | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0001 | 0.0001 | 0.0008 | 0.0000 | nc |
| KwaZulu/Natal | 0.0000 | 0.0000 | 0.0000 | 0.0001 | 0.0001 | 0.0003 | 0.0000 | 0.0000 | 0.0002 | nc |
| Limpopo | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0002 | 0.0000 | nc |
| Mpumalanga | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | nc |
| Northern Cape | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0005 | 0.0009 | 0.0000 | nc |
| North West | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0001 | 0.0015 | 0.0005 | nc |
| Western Cape | 0.0002 | 0.0000 | 0.0002 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | nc |
| Total | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0001 | 0.0000 | 0.0004 | 0.0001 | nc |

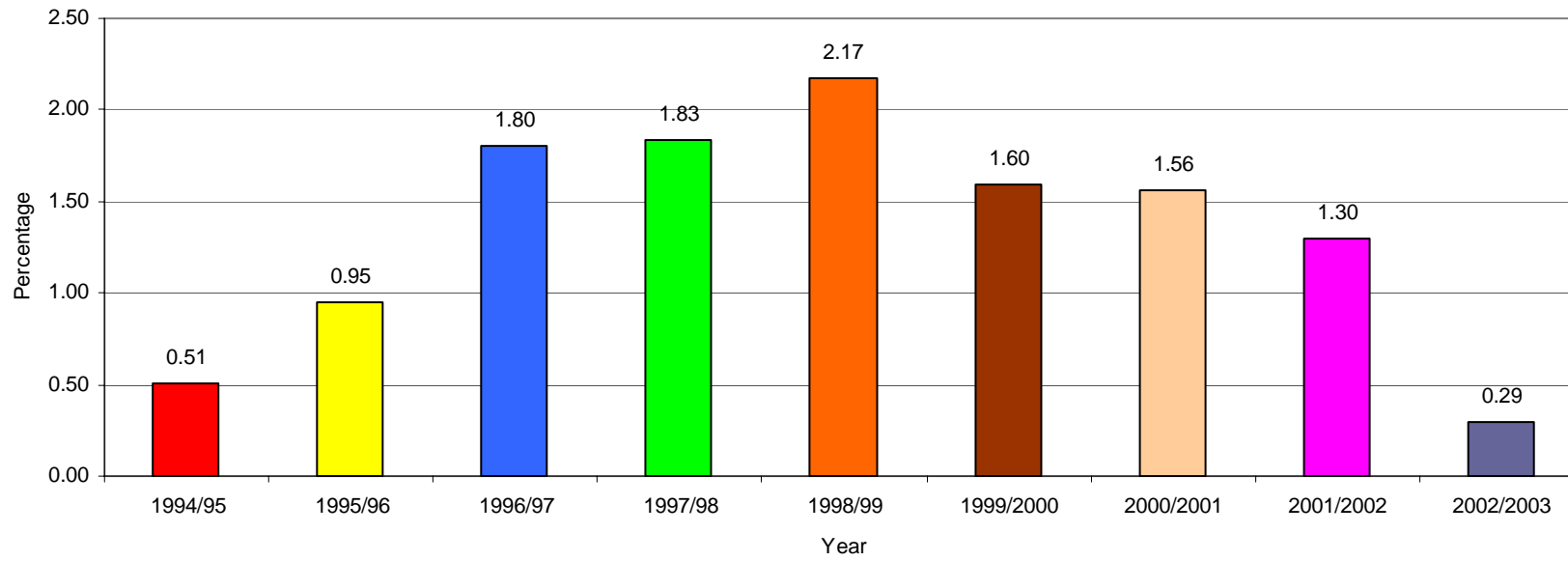
Benefiaries in income bracket R3501 and more as % of households; 1994/95 to 2002/03



Beneficiaries as % of total households: Income bracket: ALL

| Province | 1994/95 | 1995/96 | 1996/97 | 1997/98 | 1998/99 | 1999/2000 | 2000/2001 | 2001/2002 | 2002/2003 | 2003/2004 |
|-----------------|----------------|----------------|----------------|----------------|----------------|------------------|------------------|------------------|------------------|------------------|
| Eastern Cape | 0.10 | 0.19 | 1.44 | 2.65 | 1.56 | 1.33 | 1.79 | 3.03 | 0.48 | nc |
| Free State | 0.21 | 1.78 | 2.07 | 1.31 | 1.86 | 2.58 | 1.02 | 1.30 | 1.30 | nc |
| Gauteng | 0.16 | 0.73 | 1.33 | 1.91 | 3.61 | 1.90 | 1.28 | 1.23 | 0.20 | nc |
| KwaZulu/Natal | 2.10 | 1.36 | 2.81 | 1.17 | 1.43 | 0.66 | 0.83 | 0.14 | 0.19 | nc |
| Limpopo | 0.01 | 0.28 | 0.64 | 1.47 | 1.84 | 1.37 | 1.71 | 0.79 | 0.04 | nc |
| Mpumalanga | 0.28 | 1.78 | 2.05 | 1.45 | 1.13 | 1.59 | 3.36 | 0.69 | 0.34 | nc |
| Northern Cape | 0.08 | 0.52 | 3.73 | 3.07 | 2.35 | 1.89 | 1.48 | 0.74 | 0.08 | nc |
| North West | 0.32 | 1.32 | 2.14 | 1.35 | 1.36 | 2.43 | 1.78 | 1.44 | 0.20 | nc |
| Western Cape | 0.18 | 1.16 | 1.76 | 2.79 | 2.96 | 1.86 | 2.07 | 2.25 | 0.19 | nc |
| Total | 0.51 | 0.95 | 1.80 | 1.83 | 2.17 | 1.60 | 1.56 | 1.30 | 0.29 | nc |

beneficiaries in all income brackets as 5 of households; 1994/95 to 2002/03



Notes:

Expenditure information covered the period April 1994 to December 2003

The number of subsidies covered the period April 1994 to December 2003.

The number of beneficiaries covered the period April 1994 to March 2003

The number of households for 1996 and 2001 were sources from STATS SA 1996 and 2001 Population Census Community profile databases. The number of households for other years were estimated by using the average annual growth rate between 1996 and 2001.

na: not available

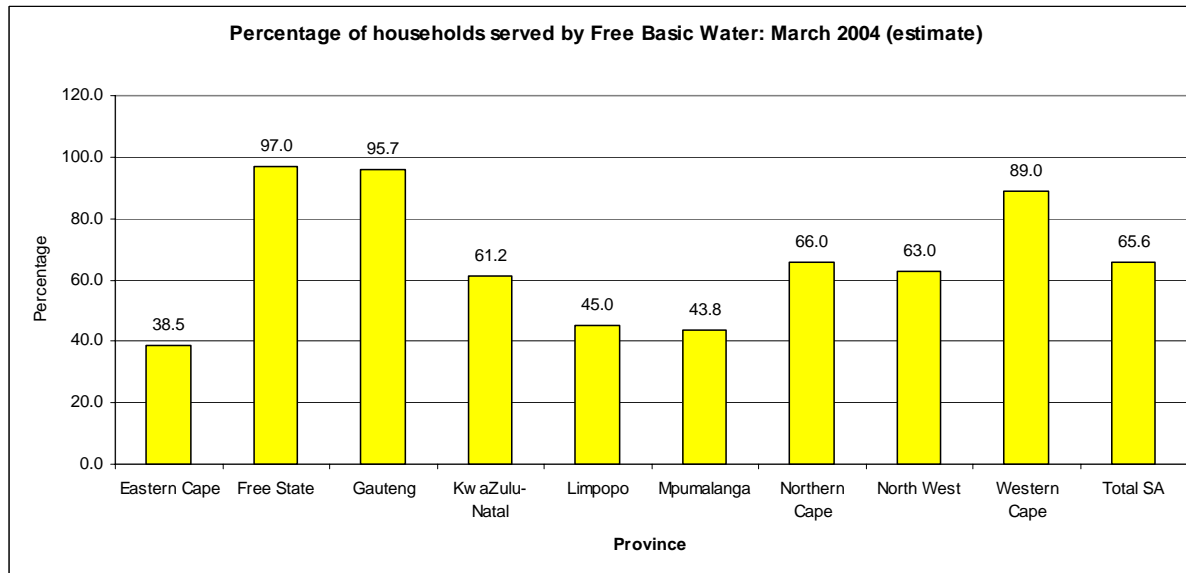
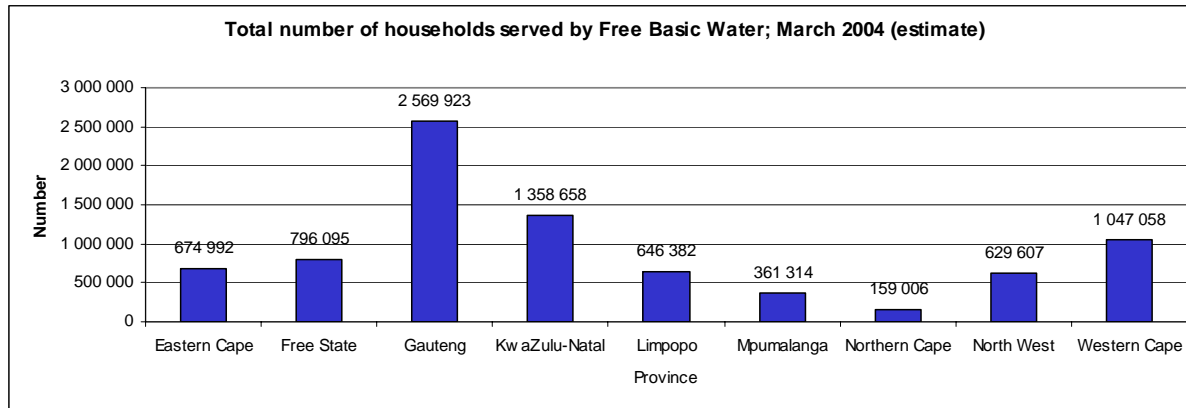
nc: not calculable

Source:

National Department of Housing: 2004. Operational Information. Pretoria

FREE BASIC WATER:

| | Total population 2004 | Population served 2004 | % population served | Total households 2004 estimate | Total households served 2004 estimate | % households served | Total population 2001 | Total households 2001 | Household size 2001 |
|-------------------|--------------------------------------|---------------------------------------|------------------------------------|---|--|------------------------------------|--------------------------------------|--------------------------------------|--------------------------------|
| Eastern | | | | | | | | | |
| Cape | 7 353 937 | 2 828 680 | 38.5 | 1 754 829 | 674 992 | 38.5 | 6 436 760 | 1 535 968 | 4.2 |
| Free State | 2 934 118 | 2 845 595 | 97.0 | 820 860 | 796 095 | 97.0 | 2 706 779 | 757 259 | 3.57 |
| Gauteng | 8 362 716 | 8 007 114 | 95.7 | 2 684 055 | 2 569 923 | 95.7 | 8 837 175 | 2 836 335 | 3.12 |
| KwaZulu- Natal | 9 503 017 | 5 820 107 | 61.2 | 2 218 405 | 1 358 658 | 61.2 | 9 426 017 | 2 200 430 | 4.28 |
| Limpopo | 6 057 659 | 2 726 238 | 45.0 | 1 436 251 | 646 382 | 45.0 | 5 273 641 | 1 250 363 | 4.22 |
| Mpumalanga | 3 286 858 | 1 441 094 | 43.8 | 824 088 | 361 314 | 43.8 | 3 122 995 | 783 004 | 3.99 |
| Northern Cape | 901 405 | 594 682 | 66.0 | 241 018 | 159 006 | 66.0 | 822 726 | 219 981 | 3.74 |
| North West | 3 751 150 | 2 362 338 | 63.0 | 999 751 | 629 607 | 63.0 | 3 669 347 | 977 949 | 3.75 |
| Western Cape | 4 402 436 | 3 918 376 | 89.0 | 1 176 408 | 1 047 058 | 89.0 | 4 524 338 | 1 208 982 | 3.74 |
| Total SA | 46 553 296 | 30 544 224 | 65.6 | 12 225 516 | 8 021 320 | 65.6 | 44 819 778 | 11 770 271 | 3.81 |



Notes:

Total population for 2004 was estimated from Census 96 information and STATS SA growth factor for 2003 (DWAF estimate).

Total number of households 2004, total number of households served 2004 were estimated by using 2001 Census information on household size.

Source:

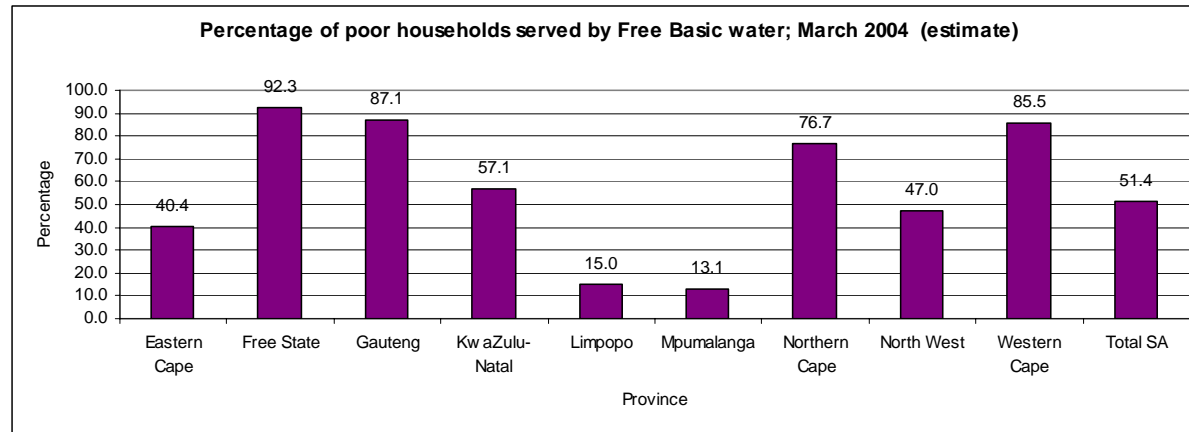
Total population 2004, population served 2004, % population served information were obtained from DWAF Website:

<http://www.dwaf.gov.za/FreeBasicWater>

**Free Basic Water: Poor population
and number of poor households
served: July 2001 to March 2004**

| Province | Total poor population 2004 | Poor population served 2004 | % poor population served 2004 | Total poor households 2004 estimate | Total poor households served 2004 estimate | % Poor households served | Total population 2001 | Total households 2001 | Household size 2001 |
|-------------------|---|--|--|--|---|---|--------------------------------------|--------------------------------------|--------------------------------|
| Eastern Cape | 5 481 547 | 2 216 093 | 40.4 | 1 308 031 | 528 814 | 40.4 | 6 436 760 | 1 535 968 | 4.2 |
| Free State | 1 951 829 | 1 801 350 | 92.3 | 546 051 | 503 953 | 92.3 | 2 706 779 | 757 259 | 3.57 |
| Gauteng | 4 055 972 | 3 532 076 | 87.1 | 1 301 784 | 1 133 637 | 87.1 | 8 837 175 | 2 836 335 | 3.12 |
| KwaZulu- Natal | 6 297 337 | 3 597 503 | 57.1 | 1 470 064 | 839 809 | 57.1 | 9 426 017 | 2 200 430 | 4.28 |
| Limpopo | 4 731 809 | 708 166 | 15.0 | 1 121 896 | 167 904 | 15.0 | 5 273 641 | 1 250 363 | 4.22 |
| Mpumalanga | 2 257 622 | 295 083 | 13.1 | 566 036 | 73 984 | 13.1 | 3 122 995 | 783 004 | 3.99 |
| Northern Cape | 524 831 | 402 316 | 76.7 | 140 330 | 107 572 | 76.7 | 822 726 | 219 981 | 3.74 |
| North West | 2 406 752 | 1 130 691 | 47.0 | 641 444 | 301 350 | 47.0 | 3 669 347 | 977 949 | 3.75 |
| Western Cape | 1 671 093 | 1 429 131 | 85.5 | 446 545 | 381 889 | 85.5 | 4 524 338 | 1 208 982 | 3.74 |

| | | | | | | | | | |
|-----------------|-------------------|-------------------|-------------|------------------|------------------|-------------|-------------------|-------------------|-------------|
| Total SA | 29 378 792 | 15 112 409 | 51.4 | 7 715 262 | 3 968 720 | 51.4 | 44 819 778 | 11 770 271 | 3.81 |
|-----------------|-------------------|-------------------|-------------|------------------|------------------|-------------|-------------------|-------------------|-------------|



Notes:

Poor population for 2004 was estimated from Census 96 information and STATS SA growth factor for 2003 and referred to the population with an income less than R1000 per month (DWAF estimate).

Total number of poor number of households 2004, total poor households served were etimated by using 2001 Census information on household size.

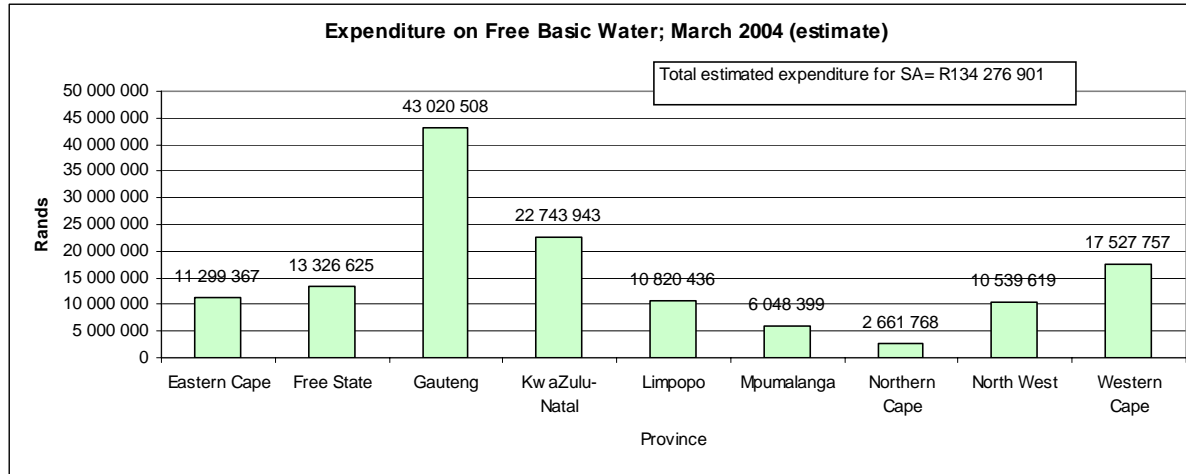
Expenditure on free basic water:

July 2001 to March 2004

(estimate)

| Province | Total | 6 kl | Cost | Expenditure |
|----------|-------|------|------|-------------|
|----------|-------|------|------|-------------|

| | households served 2004 estimate | water per month free | (Cent per kl) | per month (March 2004) (Rands) |
|-------------------|--|---|--------------------------|---|
| Eastern Cape | 674 992 | 6 | 2.79 | 11 299 367 |
| Free State | 796 095 | 6 | 2.79 | 13 326 625 |
| Gauteng | 2 569 923 | 6 | 2.79 | 43 020 508 |
| KwaZulu- Natal | 1 358 658 | 6 | 2.79 | 22 743 943 |
| Limpopo | 646 382 | 6 | 2.79 | 10 820 436 |
| Mpumalanga | 361 314 | 6 | 2.79 | 6 048 399 |
| Northern Cape | 159 006 | 6 | 2.79 | 2 661 768 |
| North West | 629 607 | 6 | 2.79 | 10 539 619 |
| Western Cape | 1 047 058 | 6 | 2.79 | 17 527 757 |
| Total | 8 021 320 | 6 | 2.79 | 134 276 901 |



Notes:

Total households served were estimated by using the Census 2001 household size. These figures represent cumulative totals from implementation (July 2001) to March 2004.

Each municipality determines its own amount of free basic water per month. For purposes of this exercise 6kl per month is used as a norm.

Cost:

Because the cost of providing water may differ substantially a general cost of R2.79c per kl is used (As obtained from the water services model) for purposes of this exercise. Factors influencing cost include the following:

- a. In some instance flat rates are used.
- b. cost varies depending on the source of water
- c. Cost varies depending on the location of the water source
- d. Cross subsidisation of services may occur

Expenditure:

Only cumulative figures are available: Information in this column thus depicts estimated expenditure for the month of March 2004.

APPENDIX 4:

TERTIARY EDUCATION

Pierre de Villiers
University of Stellenbosch

Fiscal incidence of expenditure on tertiary education. A comparison between 1995 & 2000

Pierre de Villiers¹⁰

Introduction

In this analysis the tertiary expenditure on technikons and universities are compared for 1995 and 2000. The technical colleges are not discussed here because it became an expenditure item of the provinces after 1994 and not enough data could be obtained to make it a worthwhile exercise to do for these institutions. In 1994 there were 65 477 full-time equivalent students at technical colleges (Race Relation Survey 1995/96). In comparison with the 280 774 full-time equivalent students at universities and 127 527 at technikons it is clear that the number of students at technical colleges are fairly small in comparison with the other two types of institutions. Financial data for technical colleges could not be obtained for the period 1994-2000. According to the Budget Expenditure Review 2001, R7 114 112 000 were allocated to tertiary education with R6 204 358 000 earmarked for universities and technikons. This left R909 764 000 that could be spend on technical colleges. However, the technical notes are not clear enough to make conclusive conclusions. Due to these uncertainties and the relatively small size of technical colleges they were excluded from this analysis.

Method of analysis

The analysis was done with headcounts of students as well as full-time equivalent student numbers. There is not much difference between the two methods because full-time equivalent numbers are just a constant fraction of headcounts of student numbers. The difference is students that are not enrolled for full courses and are therefore not counted as full-time students when subsidies are determined. The number of enrolled students at both technikons and universities were obtained from the relevant Race Relations Surveys. These student numbers are available per race per

¹⁰ Economics Department, University of Stellenbosch

institution. The funds spent on tertiary education were obtained from the Budget of 1995 and the Budget Expenditure Review for 2000.

Two methods of analysis are done. In the first instance it is assumed that all students receive the same subsidy and with the second method a distinction is made between students in the human sciences and those studying in the natural sciences. The results of these two methods are discussed separately and the most important reasons for different subsidies for different racial groups will be highlighted.

Subsidies spent proportionally

With the first method it was assumed that the funds were spent proportionally to the number of students at each institution. It was thus assumed that the subsidy for each student at an institution was the same and that no distinction was made according to race or course followed. The conversion to full time equivalent numbers (FE) was done from the Information on the State Budget for Higher Education. The subsidies calculated per student will differ in size between these two methods, although the relative difference will be the same. The reason is because the only difference between the two methods is that you divide with a smaller number of students with the FE-method. The relative difference between subsidies per student with headcount of students and FE student numbers will differ from institution to institution, but the relative difference between racial groups stays the same with this method. With this method the most equal possible distribution of education subsidies between racial groups are discussed.

Table 1

Expenditure on Technikon education: 1995

| | Blacks | Coloureds | Indian | Whites |
|-----------------------------------|--------|-----------|--------|--------|
| Enrollment % | 48.0 | 7.7 | 5.7 | 38.5 |
| Expenditure % | 49.0 | 8.2 | 5.7 | 37.1 |
| Per capita expenditure: Headcount | R5 402 | R5 621 | R5 260 | R5 092 |
| Per capita expenditure: Full-time | R7 978 | R8 598 | R8 402 | R7 574 |

In Table 1 the enrollment percentage of each racial group to the total number of students at all the technikons are given as well as the percentage of total expenditure allocated to each group. The table also includes the per capita expenditure per headcount and per full- time equivalent student.

Somewhat surprisingly there was not much difference between the different racial groups. The relatively high expenditure on blacks can be explained by the high subsidies paid to Border Technikon (more than double the subsidy per student than at any other technikon) where basically all students was black. Transkei and Setlogelo Technikons also received high subsidies per student and were exclusively black. The cheapest technikon (measured in subsidy per student) was Technikon South Africa with a per student subsidy of less than 30% of the second lowest subsidy per technikon student. The difference between the highest (coloured) and lowest (white) subsidy per student was less than 10%, and almost negligible.

Table 2

Expenditure on technikon education: 2000

| | Blacks | Coloureds | Indian | Whites |
|--|----------------------------|----------------------------|----------------------------|----------------------------|
| Enrollment % | 73.1 | 6.2 | 3.9 | 16.7 |
| Expenditure % | 73.3 | 6.6 | 4.6 | 15.5 |
| Per capita expenditure: Headcount <i>[In 1995 prices]</i> | R9 035 <i>[R6 541]</i> | R9 548 <i>[R6 913]</i> | R10 560 <i>[R7645]</i> | R8 324 <i>[R6 027]</i> |
| Per capita expenditure: Full-time <i>[In 1995 prices]</i> | R12 611 <i>[R9 130]</i> | R13 223 <i>[R9 573]</i> | R13 657 <i>[R9 888]</i> | R12 071 <i>[R8 739]</i> |

How did the picture changed from 1995 to 2000? The number of black students at technikons increased by almost 60 % and by far the majority of students were black by 2000 (see Table 2). Expenditure per student is also given in 1995 prices so that it can easily be compared with the 1995-values. The highest subsidy per student was paid to ML Sultan Technikon where about one third of all Indian students were attending the institution. This partly explains the high subsidy per Indian student. The low subsidy of white students can be explained by the fact that about one third of total white students attended Technikon South Africa which received the lowest subsidy per student. Here the difference between the lowest subsidy (white) and highest subsidy (Indian) is quite substantial with more than a 20% difference.

For both 1995 and 2000 whites received the lowest subsidy per student, coloureds received the highest subsidy in 1995 while Indians received the highest subsidy in 2000. The difference between the subsidies paid to the different groups widened over the years if we calculate it using the above-mentioned method.

Table 3

Expenditure on university education: 1995

| | Africans | Coloureds | Indian | Whites |
|-----------------------------------|----------|-----------|---------|---------|
| Enrollment % | 50.8 | 5.0 | 6.9 | 37.3 |
| Expenditure % | 46.7 | 5.3 | 7.1 | 40.9 |
| Per capita expenditure: Headcount | R7 318 | R8 385 | R8 223 | R8 732 |
| Per capita expenditure: Full-time | R9 844 | R11 204 | R11 329 | R12 364 |

Exactly the same procedure was followed with universities for the two years under discussion. Here the gap between the different groups in 1995 was not that big, although there was more than a 16% difference between white and black subsidies per student (see Table 3). The gap would be even wider, but the highest subsidy per FE student was paid to Medunsa (R27 200), North West (R25 959) and Transkei (R17 696) that was almost exclusively black. Unisa received the lowest subsidy per student (R4 399) and with almost one third of all white students enrolled at Unisa decreased the white subsidy per student quite substantially. These two factors brought the two figures closer than would otherwise be the case.

Table 4

Expenditure on university education: 2000

| | Africans | Coloureds | Indian | Whites |
|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Enrollment % | 53.3 | 4.8 | 8.2 | 33.7 |
| Expenditure % | 54.9 | 4.8 | 8.0 | 32.3 |
| Per capita expenditure: Headcount <i>[In 1995 prices]</i> | R12 640 <i>[R9 151]</i> | R12 330 <i>[R8 927]</i> | R11 935 <i>[R8 641]</i> | R11 785 <i>[R8 532]</i> |
| Per capita expenditure: Full-time <i>[In 1995 prices]</i> | R17 677 <i>[R12 798]</i> | R17 516 <i>[R12 682]</i> | R17 422 <i>[R12 614]</i> | R17 261 <i>[R12 470]</i> |

From 1995 to 2000 the situation changed quite dramatically. Although the number of black students increased by only 2.5 percentage points of the total number of students this group received 8.2 percentage points more of the total funds channeled to universities (see Table 4). This resulted in the subsidy per student that was much more evenly spread between the different groups in 2000 than in 1995. There is only about 7 % difference between the highest and the lowest subsidy per student. The figure for blacks is artificially high due to high subsidies paid per FE student at

Medunsa (R52 963 – due to mainly natural sciences being presented there) and Transkei (R29 423). However, their figure is lowered by the lowest subsidy per student (excluding Unisa) being paid to Port Elizabeth (R15 601) where almost 9% of all black students were studying. The difference between the different racial groups by 2000 was negligible small.

Distinction between students in natural and human sciences

With the next method a distinction was made between students doing courses in human sciences and those following courses in natural sciences to see how that influenced the subsidy per student. With this method the number of students, according to race, that received degrees, diplomas or certificates at universities and technikons in 1998 and 2000 in human and natural sciences were taken from the Race Relations Surveys 2001/02 (page 268) and 2002/03 (page 274). The difference between the number of awards between the two fields of study did not change much over this period and the average of the two years was used as a proxy for students taking courses in the natural and human sciences. It was further assumed that the ratio between the number of students in the human sciences relatively to those in the natural sciences did not change between 1995 and 2000. It was also assumed that the ratio of the number of students of each racial group following human sciences relatively to natural sciences at a specific institution was equal to the national ratio. The subsidy paid to students in the natural sciences was 2.55 times more than for those in human sciences in 2003. This ratio did not change much since the introduction of the Sapse formula and it was assumed that subsidy per student was distributed in this ratio for both 1995 and 2000.

Table 5

Expenditure on technikon education with distinction between human and natural sciences: 1995

| | Blacks | Coloureds | Indian | Whites |
|-----------------------------------|--------|-----------|--------|--------|
| Enrollment % | 48.0 | 7.7 | 5.7 | 38.5 |
| Expenditure % | 47.0 | 8.7 | 6.3 | 38.1 |
| Per capita expenditure: Headcount | R5 179 | R5 934 | R5 816 | R5 224 |
| Per capita expenditure: Full-time | R7 648 | R9 077 | R9 290 | R7 771 |

The subsidy per student for 1995 between the different racial groups was remarkably of the same magnitude. However, the figures for blacks may give the wrong impression. They represented 48% of the total number of students at technikons, but although this represented 51.1% of students in human sciences they were only 37.6% of students in natural sciences. The Border Technikon

received the most funds per FE student (R21 068) and Setlogelo (9 739) and Transkei (R11 417) also received much more per student. Students at all three these institutions were almost exclusively black. The other technikons received between R6 300 and R8 700 per student. The one exception was Technikon South Africa that received only R2 419 per student. Seeing that approximately 47% black technikon students attended this institution, this decreased the amount payable per black student quite substantially.

The picture changed quite dramatically in 2000 (see Table 6). The gap between the highest (Indians) and the lowest (whites) subsidy per student widened to almost 30%. The number of students following courses in the natural sciences can explain the relatively high subsidy per Indian student. Although they were only 4.3% of the total number of students they represented 7.4% of students studying in the natural sciences. The same applies to coloured students. They were 6.2% of the students, but 8.8% of students in the natural sciences. The number of students taking courses in human sciences can explain the low subsidy per black student. They were 73.3% of technikon students, but represented only 63.3% of students in the natural sciences. This figure was further lowered by the low subsidies per FE student paid to Technikon South Africa (R4 905) as well as Pretoria (R8 739). Almost 47% of black students were enrolled at these two institutions. However, their figure was increased by the highest FE student subsidies being paid to Border (R12 995), Mangosuthu (R13 598) and Witwatersrand (R13 026) Technikons. No other technikon received more than R12 400 per FE student. White students were 16.2% of the total number of students, but represented 20.2% of students in the natural sciences. This should lead to a high subsidy per student, but the low subsidy paid to Technikon South Africa (R4 905) and Pretoria (R8 739) lowered their figure substantially. Almost 54% of white students were enrolled at these two institutions.

Table 6

Expenditure on technikon education with distinction between human and natural sciences: 2000

| | Blacks | Coloureds | Indian | Whites |
|--|---------------------------|----------------------------|----------------------------|---------------------------|
| Enrollment % | 73.3 | 6.3 | 4.3 | 16.2 |
| Expenditure % | 71.4 | 7.1 | 5.3 | 16.2 |
| Per capita expenditure: Headcount <i>[In 1995 prices]</i> | R8 795 <i>[R6 368]</i> | R10 252 <i>[R7 422]</i> | R12 128 <i>[R8 781]</i> | R8 742 <i>[R6 329]</i> |
| Per capita expenditure: Full-time | R12 276 | R14 199 | R15 685 | R12 677 |

| | | | | |
|-------------------------|-----------------|------------------|------------------|-----------------|
| <i>[In 1995 prices]</i> | <i>[R8 888]</i> | <i>[R10 280]</i> | <i>[R11 356]</i> | <i>[R9 178]</i> |
|-------------------------|-----------------|------------------|------------------|-----------------|

If we look at the figures for universities in 1995 the subsidy per student is very much the same for Indians, coloured and white students, but for blacks it is much lower (see Table 7). The difference between the highest and lowest subsidy was more than 20%. The high figure for the first three groups can be explained by the fact that those students were more enrolled in natural sciences. While white students were 36.1% of total university students they represented 41.4% of students in the natural sciences. Indian students were 6.8% of total students and 10.8% of those studying in natural sciences. Coloured students represented 5.1% of the total number of students and they were 6.5% of those studying in natural sciences.

Table 7

Expenditure on university education with distinction between human and natural sciences: 1995

| | Blacks | Coloureds | Indian | Whites |
|-----------------------------------|--------|-----------|---------|---------|
| Enrollment % | 51.9 | 5.1 | 6.8 | 36.1 |
| Expenditure % | 45.1 | 5.5 | 7.9 | 41.4 |
| Per capita expenditure: Headcount | R7 066 | R8 814 | R9 209 | R8 838 |
| Per capita expenditure: Full-time | R9 496 | R11 733 | R12 688 | R12 515 |

The low figure for black students can be explained by various factors. They represented 51.9% of the total number of students, but they were only 41.2% of students studying in the natural sciences. Their average subsidy figure was further lowered by the low subsidies paid to Unisa and Vista. Almost 50% of black students attended these two institutions. However, their subsidy was artificially increased by the high subsidy per FE student paid to Medunsa (R20 481), North West (R20 296) and Transkei (R13 836). Except for the University of the Witwatersrand (R14 120) no other university received a subsidy of more than R12 400 per student. Clearly, with this method it does seem as though there was a substantial difference between the subsidy paid per black student relatively to the other three groups.

How did the picture changed in 2000? (see Table 8). The number of black students moving into universities did not change at the same rate as the technicons. The number of white and coloured students decreased in this 5-year period, but Indian students increased by more than 16% and blacks by approximately 5%. The high subsidy per Indian student can be explained by the fact that

although they were only 8.0% of the students they represented 13.0% of the students in natural sciences. The same applies to white students that were 32.8% of the students, but were almost 39% of students in natural sciences. Their figure was decreased by the fairly low subsidy (R5 441) that Unisa received per FE student. More than 26% of FE white students were enrolled at Unisa.

Table 8

Expenditure on university education with distinction between human and natural sciences: 2000

| | Blacks | Coloureds | Indian | Whites |
|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Enrollment % | 54.4 | 4.8 | 8.0 | 32.8 |
| Expenditure % | 52.8 | 5.1 | 9.0 | 33.2 |
| Per capita expenditure: Headcount <i>[In 1995 prices]</i> | R12 146 <i>[R8 794]</i> | R13 038 <i>[R9 440]</i> | R13 525 <i>[R9 792]</i> | R12 080 <i>[R8 746]</i> |
| Per capita expenditure: Full-time <i>[In 1995 prices]</i> | R16 986 <i>[R12 298]</i> | R18 523 <i>[R13 107]</i> | R19 744 <i>[R14 947]</i> | R17 694 <i>[R12 810]</i> |

The relatively low subsidy per black student can to a large extent be explained by so many black students taking courses in the human sciences. Although they were more than 54% of the students they represented only about 43% of students in the natural sciences. Their figure is also lowered by the low FE subsidy of Unisa (R5 441) where almost 20% of black students were enrolled. The black subsidy figures were artificially increased by high FE subsidies to Fort Hare (R18 626), Medunsa (R40 212) and Transkei (R22 878). The difference between the highest (Indian) and the lowest (whites) subsidy per FE student decreased to just above 10% in 2000.

Concluding remarks

Although a few other options were investigated it did not lead to much different results than the above-mentioned. Therefore only the results of these methods will be summarized, although an

appendix is attached with the same analysis except that Technikon South Africa and Unisa were excluded. The difference in subsidy per FE student at technikons increased from about 10% in 1995 to 20% in 2000 when we use the first method. When a distinction is being made between students in natural and human sciences the difference is bigger. In 1995 it was about 17% and in 2000 approximately 30%. With both methods the gap between the highest and the lowest subsidy paid per student widened over the period under discussion.

With universities the opposite results were achieved. With the first method the difference between the highest and lowest subsidy per FE students was 16% in 1995 that decreased to only 7% in 2000. When a distinction was made between natural and human sciences, the gap decreased from 20% to only 10%. With both methods the difference between subsidies paid per student (per race) was negligible by 2000.

APPENDIX 4A

Table 1b

Expenditure on Technikon education (excluding Technikon South Africa): 1995

| | Blacks | Coloureds | Indian | Whites |
|-----------------------------------|---------|-----------|---------|---------|
| Enrollment % | 47.9 | 7.9 | 6.0 | 38.4 |
| Expenditure % | 48.9 | 8.4 | 6.0 | 36.7 |
| Per capita expenditure: Headcount | R8 361 | R8 330 | R6 899 | R7 704 |
| Per capita expenditure: Full-time | R10 859 | R11 618 | R10 533 | R10 163 |

Table 2b

Expenditure on technikon education (excluding Technikon South Africa): 2000

| | Blacks | Coloureds | Indian | Whites |
|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Enrollment % | 74.1 | 6.1 | 4.4 | 15.4 |
| Expenditure % | 73.7 | 6.6 | 4.7 | 15.0 |
| Per capita expenditure: Headcount <i>[In 1995 prices]</i> | R11 207 <i>[R8 838]</i> | R12 359 <i>[R8 948]</i> | R13 368 <i>[R9 678]</i> | R10 568 <i>[R7 651]</i> |
| Per capita expenditure: Full-time <i>[In 1995 prices]</i> | R14 541 <i>[R10 527]</i> | R15 668 <i>[R11 343]</i> | R15 705 <i>[R11 370]</i> | R14 259 <i>[R10 323]</i> |

Table 3b

Expenditure on university education (excluding Unisa): 1995

| | Africans | Coloureds | Indian | Whites |
|-----------------------------------|----------|-----------|---------|---------|
| Enrollment % | 53.2 | 5.5 | 6.2 | 35.0 |
| Expenditure % | 46.6 | 5.4 | 6.9 | 41.0 |
| Per capita expenditure: Headcount | R9 612 | R10 466 | R12 635 | R12 281 |
| Per capita expenditure: Full-time | R11 336 | R12 638 | R14 329 | R15 141 |

Table 4b

Expenditure on university education (excluding Unisa): 2000

| | Africans | Coloureds | Indian | Whites |
|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Enrollment % | 56.9 | 4.8 | 7.0 | 31.3 |
| Expenditure % | 55.9 | 4.8 | 7.6 | 31.8 |
| Per capita expenditure: Headcount <i>[In 1995 prices]</i> | R15 633 <i>[R11 318]</i> | R15 829 <i>[R11 460]</i> | R17 484 <i>[R12 658]</i> | R15 657 <i>[R11 335]</i> |
| Per capita expenditure: Full-time <i>[In 1995 prices]</i> | R20 191 <i>[R14 618]</i> | R20 529 <i>[R14 863]</i> | R22 318 <i>[R16 154]</i> | R20 830 <i>[R15 081]</i> |

Table 5b

Expenditure on technikon education with distinction between human and natural sciences
(excluding Technikon South Africa): 1995

| | Blacks | Coloureds | Indian | Whites |
|-----------------------------------|---------|-----------|---------|---------|
| Enrollment % | 47.9 | 7.7 | 6.0 | 38.4 |
| Expenditure % | 47.0 | 8.8 | 6.6 | 37.6 |
| Per capita expenditure: Headcount | R8 035 | R8 772 | R7 586 | R7 886 |
| Per capita expenditure: Full-time | R10 436 | R12 236 | R11 583 | R10 402 |

Table 6b

Expenditure on technikon education with distinction between human and natural sciences
(excluding Technikon South Africa): 2000

| | Blacks | Coloureds | Indian | Whites |
|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Enrollment % | 74.1 | 6.1 | 4.4 | 15.4 |
| Expenditure % | 71.6 | 7.0 | 5.4 | 15.8 |
| Per capita expenditure: Headcount <i>[In 1995 prices]</i> | R10 921 <i>[R7 907]</i> | R13 231 <i>[R9 579]</i> | R15 310 <i>[R11 084]</i> | R11 081 <i>[R8 023]</i> |
| Per capita expenditure: Full-time <i>[In 1995 prices]</i> | R14 170 <i>[R10 258]</i> | R16 774 <i>[R12 144]</i> | R17 985 <i>[R13 021]</i> | R14 950 <i>[R10 824]</i> |

Table 7b

Expenditure on university education with distinction between human and natural sciences
(excluding Unisa): 1995

| | Blacks | Coloureds | Indian | Whites |
|-----------------------------------|---------|-----------|---------|---------|
| Enrollment % | 53.2 | 5.5 | 6.2 | 35.0 |
| Expenditure % | 45.2 | 5.7 | 7.7 | 41.5 |
| Per capita expenditure: Headcount | R9 306 | R10 990 | R14 106 | R12 406 |
| Per capita expenditure: Full-time | R10 974 | R13 272 | R15 997 | R15 296 |

Table 8b

Expenditure on university education with distinction between human and natural sciences
(excluding Unisa): 2000

| | Blacks | Coloureds | Indian | Whites |
|--|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Enrollment % | 56.9 | 4.8 | 7.0 | 31.3 |
| Expenditure % | 53.8 | 5.1 | 8.6 | 32.5 |
| Per capita expenditure: Headcount <i>[In 1995 prices]</i> | R15 056 <i>[R10 901]</i> | R16 731 <i>[R12 113]</i> | R19 792 <i>[R14 329]</i> | R16 044 <i>[R11 616]</i> |
| Per capita expenditure: Full-time <i>[In 1995 prices]</i> | R19 445 <i>[R14 078]</i> | R21 700 <i>[R15 711]</i> | R25 259 <i>[R18 287]</i> | R21 345 <i>[R15 454]</i> |