

# Mapping socio-economic status, geographical location and matriculation pass rates in Gauteng, South Africa

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*In South Africa, prior to 1994, the racially defined geographical neighbourhood in which a child resided usually determined which school they could enrol in. Post 1994, this changed to legally allow enrolment in any public school. Unfortunately, due to the legacy of apartheid, in particular, resource allocation inequity, schools in African areas seldom offered quality education. Thus, African parents seeking quality public education for their children had to either opt for commuting or moving home, both options having financial implications. For the purposes of this study, quality education is defined using three variables: matriculation pass rates, learner-to-teacher ratios, and quintile rankings, even though use of these variables have their limitations. Almost two decades since the demise of apartheid, this study found that there is still a strong relationship between the old 'apartheid' geographical zoning, where the right to reside in an area was previously designated by race, and resourced schooling in the South African province of Gauteng. It also found a collinear relationship between resourced schools, teacher-to-learner ratios, school fees and matriculation pass rates. That is, schools ranked as quintile 4 and 5 schools, which have low teacher-to-learner ratios and charge more than R6 500 per year in school fees, generally produce high matriculation pass rates. There were some exceptions, with a few no-fee, quintile one schools, located in formerly African zoned areas, which also achieved high matriculation pass rates.*

**Keywords:** matriculation success; spatial distribution; teacher-learner ratios; school fees; Gauteng; quality education

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## **Introduction**

Prior to 1994, South African children in school usually attended a neighbourhood one, close to where they lived. But, as apartheid laws restricted where people could live by their race, school enrolment was effectively both racially and geographically zoned (Swilling, 1991; Kalloway, 1997; Bell & McKay, 2011). Under apartheid, racial categorisation also conferred socio-economic status, so schooling was further segregated by class. Furthermore, children usually attended a school that had their home language as the language of teaching and learning (Johnson, 1982; Molteno, 1984).

Post 1994, the South African Schools Act (SASA), Act No 84 of 1996, gave learners the legal right to access any public school, regardless of race. African learners, who could afford it, flocked to enrol in former white schools (Soudien & Sayed, 2003; Maile, 2004; Msila, 2008; Fataar, 2009; Bell & McKay, 2011). This movement was primarily to access 'quality' education, as apartheid actively embedded inequality into South African society by purposefully (and massively) underfunding African schools (Christie & Collins, 1982; Pillay, 1990; Weber, 2002; Fleisch, 2008).

African schools under apartheid were characterised by too few teachers (many of whom were under or unqualified), thinly spread physical resources, and poor school management (Chisholm, 1983; Nattrass & Seekings, 2001; Fataar, 2008). Furthermore, as sites for the anti-apartheid struggle, any culture of teaching and learning that did prevail, was destroyed in the 'liberation before education' campaign (Enslin & Pendlebury, 1998; Hofmeyr, 2000; Maile, 2004).

Unfortunately, in general, most schools offering quality public education were semi-privatised under the de Klerk government, just prior to the 1994 transition. These schools, thus, began charging school fees, meaning that access was restricted by the ability to pay. Even though the post-apartheid government subsequently introduced a school fee waiver system, there is evidence that it does not work well. Moreover, in Gauteng, schools are allowed to manage admissions using geographical catchment zoning, the boundaries of which often conform to former apartheid spatial configurations (Bell & McKay, 2011). So, not only must parents be able to pay the fees, they must also either relocate to a former white area or commute to gain access to quality education (Sekete *et al.*, 2001; Louw, 2004; Redpath, 2006; Soudien, 2007; Bell & McKay, 2011; GDE, 2011; Lancaster, 2011; Lucas, 2011). Thus, access to quality education is now driven more by class division than by race division alone (Lemon, 1994; 1995; Sayed, 1999; Bush & Heystek, 2003). That is, children of people of high social standing (regardless of race) access well-resourced schools. Children of the poor do not (Sujee, 2004, Soudien *et al.*, 2004, Fiske & Ladd, 2006; Redpath, 2006; Woolman & Fleish, 2009; Bloch, 2010; Bell & McKay, 2011). Sadly, then, it seems that many learners, by dint of their socio-economic status, may be permanently locked into enrolling in poorly resourced schools. Geographically, in Gauteng, they are 'zoned' outside of the catchment zones of the resourced schools.

Financially, they are confined to township schools which have not transformed into sites of excellence, despite massive injections of money into education by the post-apartheid government. Township are still characterised by fewer, less qualified teachers, poor physical resources (such as libraries), and poor school management systems (Bush & Heystek, 2003; Herman, 2003; Gustafsson & Patel, 2006; Motala, 2006; Evoh & Mafu, 2007).

This study seeks to contribute to the literature by providing a detailed analysis of high school location, socio-economic status, and matriculation pass rates for the province of Gauteng. It seeks to examine the effect that embedded spatial apartheid and resource inequality has on the distribution of matriculation pass rates across Gauteng. It, therefore, seeks to address the call by Fleisch (2008) to provide a comprehensive picture of the effects of funding inequalities. Results presented here represent the early empirical findings of a much larger, on-going study.

## **The impact of neighbourhood socio-economic status on schooling**

Internationally, several studies have found that the geographic location of a school is significant. That is, the geographic neighbourhood a school is located in influences the quality of the education provided by the school. In the United States of America, for example, Bell (2003; 2007; 2009) concluded that poor learners end up with poor quality teachers because schools reflect the socio-economic characteristics of the neighbourhood they are located in. Research conducted in Peru by Peters and Hall (2004) concurs. They found that schools located in low socio-economic areas are less likely to have sufficient resources or modern infrastructure. Thus, while attending a neighbourhood school is ideal, if the quality of the school is poor, it may be better to commute or move house to access a better one (Sinha *et al.*, 2005; Nettles *et al.*, 2008). Moving house to access quality schooling was found to be a common practice in countries such as New Zealand, Sweden, United Kingdom and Germany (Parsons *et al.*, 2000; White *et al.*, 2001; Butler & Robson, 2003; La Rocque, 2004; Söderström & Uusitalo, 2004; Pearce & Gordon, 2005; Noreisch, 2007; Thrupp, 2007). However, only financially stable parents can do this. For example, Davidoff and Leigh (2007) demonstrated that Australian parents pay up to 3.5% more for a house located in the catchment area of a 'better' school than one which is not. This drives up prices of homes in such localities, further excluding low-income households from accessing quality education. The cheaper alternative to moving house is commuting, although a long commute may negatively affect the child's well-being due to weakened family bonds and less family and relaxation time (Bell, 2007). Thus, when parents move house or pay for a commute and/or pay school fees, Yamauchi (2011) found that schooling costs invariably rise. Under such circumstances, socio-economic mobility is limited (Weber, 2002; Lemon, 2004; Gibbons & Machin, 2007). It can, therefore, be concluded that social equality and intergenerational mobility is best promoted by

ensuring that neighbourhood schools are 'schools of choice', that is, they are well resourced and viewed as providers of quality education.

## **Accessing public schools in South Africa**

Since the demise of apartheid, South Africa's education landscape has begun to mirror international trends. In particular, it seems that several limiting socio-economic mobility factors are at play. For example, poor learners are not able to enrol in resourced schools because their parents cannot afford the school fees, as Bell and McKay (2011) found for Sandton schools. Anderson *et al.* (2001) found evidence that parents are moving house in order to fall into the catchment zones of resourced schools. That is, educated, financially secure people actively selected to reside in neighbourhoods with schools that had small classes and high test scores. As moving house is a costly option, many more parents opt for the learner commute. This daily school commute has two important trends: (1) a commute from former African areas to schools in former white areas, and (2) an intra-township commute where learners travel from one part of an African township to a school in another part of the same African township (Sekete *et al.*, 2001; Soudien *et al.*, 2004; Bisschoff & Koebe, 2005; Fataar, 2007; 2009; Hunter, 2010; Soudien, 2010). Sekete *et al.* (2001) maintain that the driver of this commute is a desire to access quality education. This commute is costly, so only those who can afford it do it. There is evidence that parents make many sacrifices to fund this commute (Woolman & Fleish, 2006). Money, however, is not the only issue.

Bush and Heystek (2003) found that the commute has social costs as well, leading to lower school enrolment, higher dropout rates and poor academic performance. As access to resourced schools comes at a price, structurally, then, the poorer you are, the more likely you will be confined to a poorly resourced school (Weber, 2002; Lemon, 2004). As a result, intergenerational poverty will persist, as poorly resourced schools do not sufficiently equip learners with the knowledge and skills required to access the world of work and/or tertiary education.

## **Research design**

Quantitative data on 561 high schools in Gauteng with regard to teacher-to-learner ratios, school fees, matriculation pass rates, geographical coordinates and quintile rankings were supplied by the Gauteng Department of Education (GDE). The data were for the year 2012, with the exception of the matriculation pass rates, which were for 2010 and 2011. Analysis was initially conducted at the level of district and then collated for the province. Geographical coordinates were used to assign schools into pre-1994 apartheid boundaries. Matriculation pass rates were determined by averaging the results for 2010 and 2011. Using the natural break method, schools were placed in one of three categories: (1) poor performers; (2) average performers; and (3) good performers. As quintile rankings are used by the state as a measure of

wealth or poverty, quintile 1, 2 and 3 schools were placed in one – poorly resourced – category and quintile 4 and 5 placed in another – well resourced – category (GDE, 2011). Teacher-to-learner ratios, also an indicator of resources, were determined by dividing the number of learners by the number of state and educators paid by the School Governing Body for each school.

Both the data and the methodology have their shortcomings. The GDE database had gaps, although, where possible, schools were contacted to obtain the missing data. Some high schools only offer Grade 7 to 9, so they were excluded. Also, using matriculation pass rates as an indicator of quality, is not without its critics (Carnoy, & Chisholm, 2008). We acknowledge that matriculation pass rates can be manipulated, by, for example, holding weak learners back, encouraging weak learners to drop out of school, or by encouraging learners to substitute a difficult subject (e.g. mathematics) with an easier one (e.g. mathematical literacy). In addition, learners can pass matric without passing all their subjects. Finally, in the South African schooling system, a pass mark of 30% is considered by many to be too low (Gilmour & Soudien, 2009). Quintile rankings and teacher-to-learner ratios are also not absolute indicators of quality. For example, some schools dispute their quintile rankings. In addition, a low teacher-to-learner ratio does not automatically guarantee academic success.

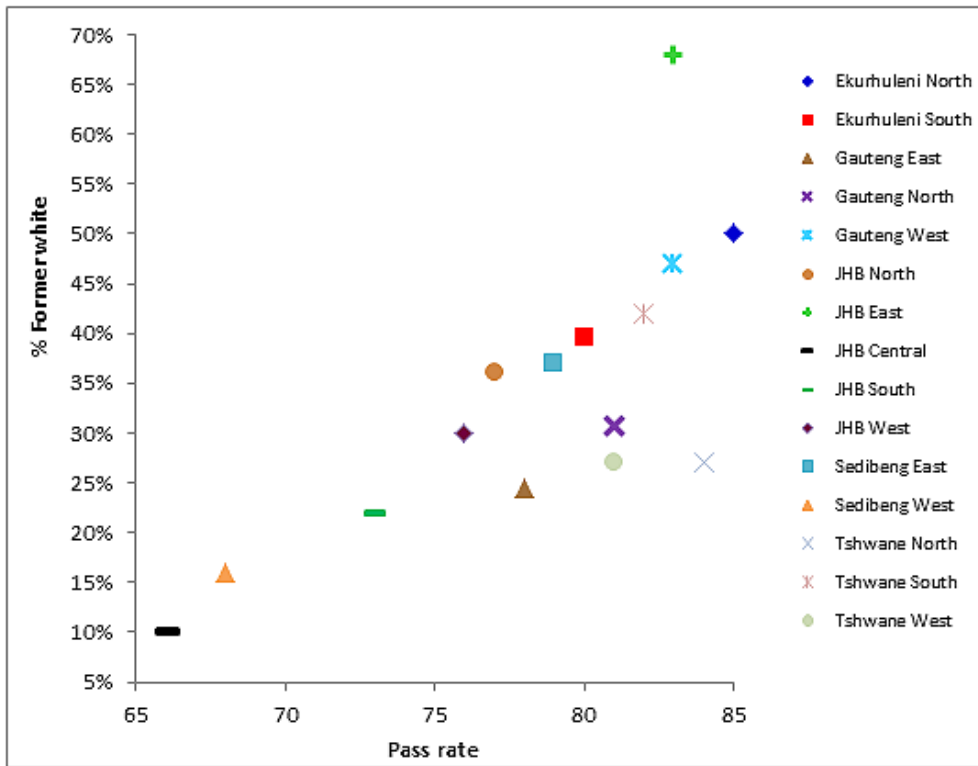
## **Results**

As table 1 shows, each education district has, on average, 8.8 and 11.53 quintile 4 and quintile 5 schools respectively. So, Gauteng is a wealthy province dominated by resourced schools. However, some education districts have more resourced schools than others. For example, districts such as Ekurhuleni North, Ekurhuleni South, Johannesburg East and Tshwane South have a disproportionately high number of resourced schools with an average of 19.75 quintile 5 schools across these four districts. In general, quintile 4 and 5 schools are located in former ‘whites only’ residential areas. In general, matriculation pass rates in these resourced districts are high; with average matriculation pass rates above 80%. Yet, Gauteng West and Tshwane North both report pass rates of over 80% as well, despite far fewer quintile 5 schools. There was a less distinct pattern between quintile ranking and matriculation pass rates for schools that produce only ‘average’ matriculation pass rates. This is due to the mean pass rates for ‘average’ performers being dragged downwards by some schools located in the Johannesburg North, Johannesburg South and Johannesburg West districts. Importantly, Johannesburg Central district, dominated by Orange Farm and Lenasia-based schools, is a significant outlier. This district is a significantly poorer performer than any other district in Gauteng, despite these schools not having quintile 1 and 2 status. Thus, based on their quintile rankings, they should be performing better than they are.

| District         | Matriculation pass rate |         |         | Quintile |      |      |      |       | Former area |       | School fees |            |
|------------------|-------------------------|---------|---------|----------|------|------|------|-------|-------------|-------|-------------|------------|
|                  | Lowest                  | Average | Highest | 1        | 2    | 3    | 4    | 5     | African     | White | Average     | Highest    |
| Gauteng North    | 41%                     | 81%     | 98%     | 2        | 7    | 0    | 2    | 2     | 69%         | 31%   | R1 443      | R8 200     |
| Sedibeng West    | 35%                     | 68%     | 99%     | 6        | 13   | 13   | 5    | 6     | 84%         | 16%   | R750        | R5 900     |
| JHB South        | 46%                     | 73%     | 100%    | 3        | 12   | 0    | 5    | 7     | 78%         | 22%   | R1 375      | R12 584    |
| JHB West         | 52%                     | 76%     | 100%    | 1        | 2    | 12   | 4    | 8     | 70%         | 30%   | R2 439      | R13 500    |
| Tshwane North    | 43%                     | 84%     | 100%    | 10       | 3    | 2    | 7    | 8     | 73%         | 27%   | R2 011      | R8 350     |
| Gauteng East     | 45%                     | 78%     | 100%    | 4        | 6    | 12   | 14   | 9     | 76%         | 24%   | R1 677      | R8 700     |
| Sedibeng East    | 46%                     | 79%     | 100%    | 1        | 2    | 5    | 2    | 9     | 63%         | 37%   | R2 577      | R6 700     |
| Tshwane West     | 33%                     | 81%     | 100%    | 10       | 3    | 7    | 16   | 9     | 73%         | 27%   | R1 598      | R8 250     |
| JHB Central      | 24%                     | 66%     | 100%    | 1        | 1    | 17   | 20   | 10    | 90%         | 10%   | R936        | R9 750     |
| Gauteng West     | 50%                     | 83%     | 100%    | 4        | 6    | 11   | 10   | 12    | 53%         | 47%   | R3 042      | R16 900    |
| JHB North        | 50%                     | 77%     | 100%    | 5        | 8    | 7    | 5    | 14    | 64%         | 36%   | R4 458      | R22 350    |
| JHB East         | 47%                     | 83%     | 100%    | 0        | 7    | 4    | 6    | 17    | 32%         | 68%   | R6 988      | R26 100    |
| Ekurhuleni South | 50%                     | 80%     | 100%    | 0        | 11   | 14   | 10   | 18    | 60%         | 40%   | R2 248      | R11 900    |
| Tshwane South    | 39%                     | 82%     | 100%    | 2        | 2    | 10   | 17   | 21    | 58%         | 42%   | R5 635      | R24 500    |
| Ekurhuleni North | 56%                     | 85%     | 100%    | 0        | 1    | 9    | 9    | 23    | 50%         | 50%   | R4 026      | R13 500    |
| Average          | 44%                     | 78%     | 100%    | 3.27     | 5.60 | 8.20 | 8.80 | 11.53 | 66%         | 34%   | R2 746.99   | R13 938.93 |

**Table 1: Matric pass rates, quintile rankings, former apartheid zoning and school fees**

Overall, there was a strong positive correlation between the average matriculation pass rate of a district and the extent to which it is home to schools located in former white areas (see figure 1). As figure 1 shows, schools in former white areas have higher matriculation pass rates than schools in former African areas. There are some exceptions to this, with the districts of Gauteng East and Gauteng North doing well despite the majority of their schools being located in former African areas. Significantly, as can be seen in table 1, the two districts with the most number of schools located in former African areas (Johannesburg Central and Sedibeng West) are also the two districts with the lowest average matriculation pass rates and are home to some of the worst-performing schools in the province.



**Figure 1: Correlation between average matriculation pass rate for a district and the percentage of schools located in former white areas in that district**

With regard to school fees, there are two key findings: First, there was a big range (R26 100) and, secondly, the majority of schools located in African areas are no-fee schools. Of the schools who do charge fees, a distinct geographical pattern emerged. The districts of Gauteng West, Johannesburg North, Johannesburg East, Tshwane South and Ekurhuleni North all charge fees higher than the average (R2 746.99) for Gauteng. The highest fees were recorded in the districts of Johannesburg North, Johannesburg East and Tshwane South. As these districts are dominated by very expensive real estate, it is speculated that school fees could be linked to household income. However, this would need further investigation. In general, schools in areas where home property values are relatively low, such as Johannesburg Central and Sedibeng West, school fees are also low, but some individual schools in Gauteng East and Johannesburg South charge very low fees. With the exception of Ekurhuleni South, it was found that the more quintile 4 and 5 schools a district has, the higher the average school fees are. Thus, resourced schools charge high school fees. Furthermore, there was a large gap between average fees and the highest fees (see table 1). Thus, each district has a small set of schools which charge very high fees, although for Gauteng West, Johannesburg North, Johannesburg East and Ekurhuleni South the gap was the widest, making these districts more unequal than the rest.

Table 2 and figures 2 and 3 detail the top- and the bottom-performing schools for Gauteng. For the top-performing schools it was found that pass rates, school fees and teacher-to-learner ratios enjoy a collinear relationship with a high correlation ( $r=-0.5$ ;  $p<0.0001$ ;  $n=183$ ) (see table 2 and figure 2). In particular, by examining the best-performing schools by district, it was determined that there was a high correlation between school fees and teacher-to-learner ratios. That is, the higher the school fees, the better the teacher-to-learner ratio although, for some schools, charging very high fees did not improve the teacher-to-learner ratio or the matriculation pass rate (as it reached 100%). Overall, the best-performing schools all had teacher-to-learner ratios of less than 1 : 24. The best-performing schools all charge school fees of more than R5 500 per year, with one exception in Johannesburg East. For the worst-performing schools, the average teacher-to-learner ratio was 1 : 28.5 and the average school fees were R35, as most were no-fee schools. In general, there was no correlation ( $r=0.14$ ;  $p=0.3$ ;  $n=188$ ) between teacher-to-learner ratios and matriculation pass rates for the worst-performing schools (see figure2)

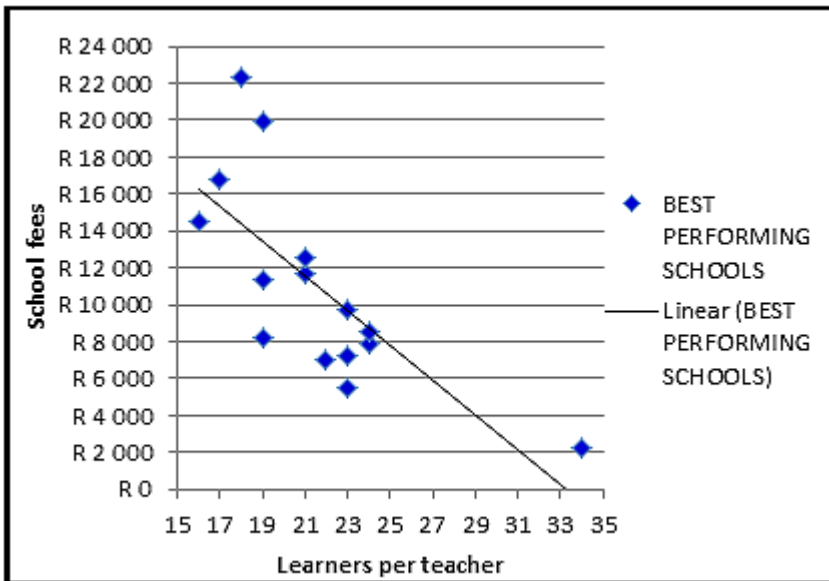


Figure 2: Correlation between school fees and teacher-to-learner ratio, top schools



| DISTRICT             | BEST-PERFORMING SCHOOLS |             |           |          | WORST-PERFORMING SCHOOLS |             |           |          |
|----------------------|-------------------------|-------------|-----------|----------|--------------------------|-------------|-----------|----------|
|                      | T : L ratio             | School fees | Pass rate | Quintile | T : L ratio              | School fees | Pass rate | Quintile |
| Ekurhuleni North     | 24                      | R7 900      | 100.00%   | 5        | 28                       | R0          | 55.83%    | 3        |
|                      | 19                      | R11350      | 100.00%   | 5        |                          |             |           |          |
| Ekurhuleni South     | 23                      | R9 700      | 100.00%   | 5        | 27                       | R0          | 49.82%    | 2        |
| Gauteng East         | 22                      | R7 080      | 100.00%   | 5        | 26                       | R0          | 44.70%    | 3        |
| Gauteng North        | 19                      | R8 200      | 98.08%    | 5        | 31                       | R0          | 40.93%    | 1        |
| Gauteng West         | 21                      | R11670      | 100.00%   | 5        | 29                       | R200        | 50.00%    | 4        |
|                      | 23                      | R5 500      | 100.00%   | 5        |                          |             |           |          |
| Johannesburg Central | 24                      | R8 500      | 99.67%    | 5        | 17                       | R150        | 24.00%    | 4        |
| Johannesburg East    | 34                      | R2 300      | 100.00%   | 5        | 29                       | R0          | 46.78%    | 2        |
|                      | 17                      | R16 800     | 100.00%   | 5        |                          |             |           |          |
| Johannesburg North   | 16                      | R14 500     | 100.00%   | 5        | 33                       | R0          | 49.84%    | 2        |
|                      | 19                      | R19 950     | 100.00%   | 5        |                          |             |           |          |
|                      | 18                      | R22 350     | 100.00%   | 5        |                          |             |           |          |
| Johannesburg South   | 21                      | R12 584     | 99.79%    | 5        | 33                       | R0          | 46.17%    | 1        |
| Johannesburg West    | 23                      | R7 200      | 99.65%    | 5        | 32                       | R0          | 52.14%    | 1        |
| Sedibeng East        | 18                      | R6 700      | 99.53%    | 5        | 29                       | R0          | 46.13%    | 2        |
| Sedibeng West        | 24                      | R5 800      | 99.48%    | 5        | 20                       | R0          | 35.14%    | 1        |
| Tshwane North        | 23                      | R8 350      | 100.00%   | 5        | 16                       | R0          | 42.57%    | 2        |
|                      | 16                      | R18 865     | 100.00%   | 5        | 27                       | R200        | 39.30%    | 3        |
|                      | 21                      | R12 400     | 100.00%   | 5        |                          |             |           |          |
| Tshwane South        | 19                      | R12 300     | 100.00%   | 5        |                          |             |           |          |
|                      | 19                      | R12 000     | 100.00%   | 5        |                          |             |           |          |
|                      | 19                      | R8 510      | 100.00%   | 5        |                          |             |           |          |
| Tshwane West         | 26                      | R5 000      | 99.56%    | 5        | 35                       | R0          | 33.14%    | 3        |
| Average              | 21.17                   | R10 646.21  | 99.82%    | 5        | 27.47                    | R36.67      | 43.77%    | 3        |

Table 2: Best- and worst-performing schools in Gauteng, by district

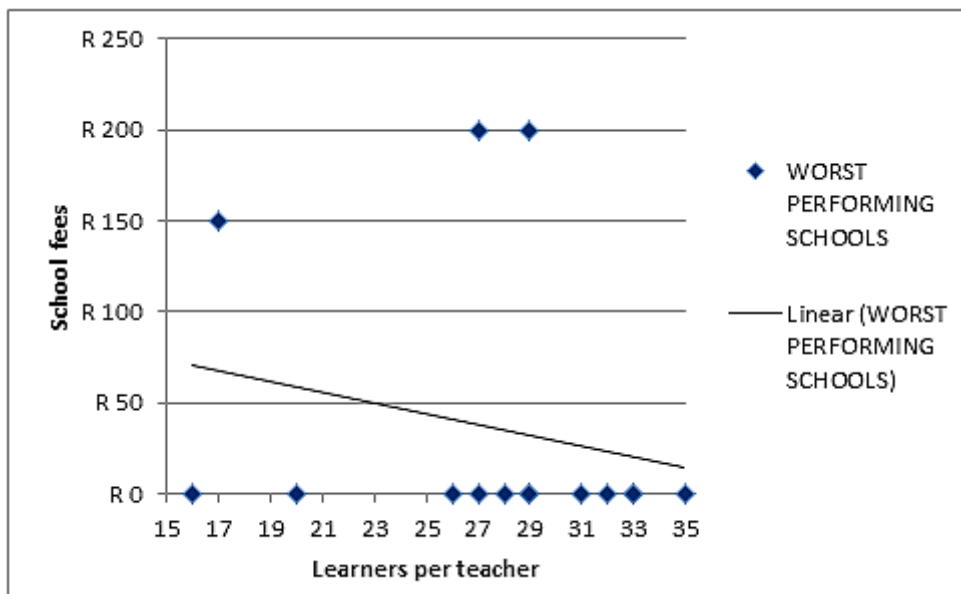
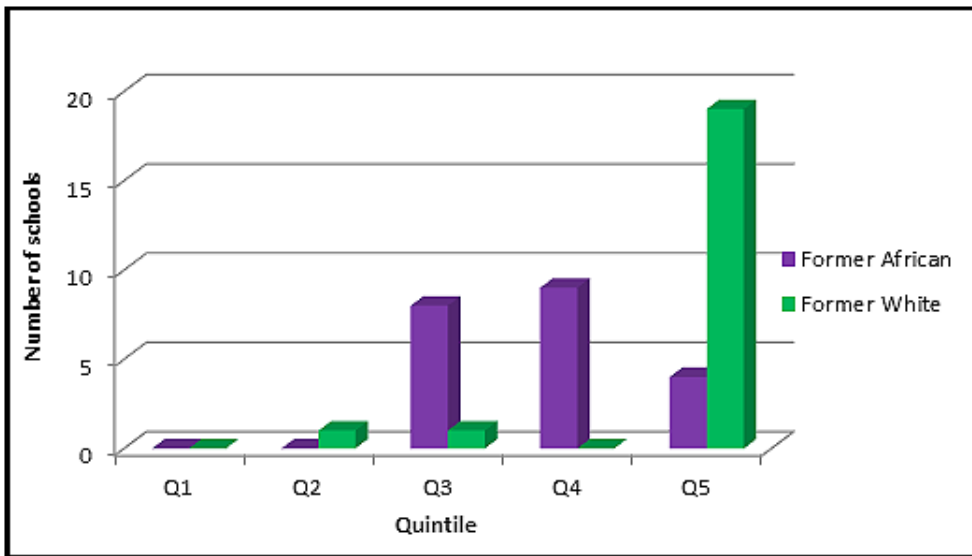


Figure 3: School fees, teacher-to-learner ratios, worst-performing schools

## An in-depth view: The case of Ekurhuleni North

Although all education districts were analysed for this study, one, Ekurhuleni North, is showcased here as it illustrates the key findings of the study. This district forms part of the Ekurhuleni Metropolitan Municipality. It is home to 42 high schools located in the northern part of the East Rand, which includes urban areas such as Benoni, Germiston, Kempton Park and Tembisa. As can be seen from figure 4, the majority (76%) of the schools are resourced, as most are either quintile 4 or quintile 5 schools. Quintile ranking is clearly linked to geographical location. Most schools in former African areas are quintile 2 to 4 schools, whereas most schools in former white geographical areas are quintile 5 schools. Thus, African learners living in formerly designated African areas will either have to commute or move house if they want to enrol in a resourced school, although there were a few exceptions. School fees ranged from R0 (no-fee schools) to R13 500 per annum. Twenty five per cent of the schools were no-fee schools. Fifty per cent of the schools charged R1 350 or less per annum, and three quarters of the schools charged less than R7 872.50 per year. Overall, no-fee and low-fee schools dominate the district (53.4%). As with the rest of Gauteng, there are a minority of schools – all quintile 4 and 5 – that charge significantly higher fees than the average.



**Figure 4: Quintile ranking of schools by former geographical zones according to race**

Matriculation pass rates for this district ranged from 55% to 100%. It was found that school fees have a positive relation to matriculation pass rates. In general, the higher the fees, the better the matriculation pass rate, although there were some cases of schools charging very low or no fees that achieved good pass rates (see figure 5). The majority of schools located in former white areas charged fees and recorded high pass rates. Moderately and poorly performing schools are mainly located in the former African neighbourhoods and they are quintile 2 to 4 schools. However, one school in a former white area had a low matriculation pass rate and eight schools located in former African areas had pass rates of over 80% (see figure 6). One school located in a former African area achieved a pass rate of over 95%. Some notable exceptions are schools located in Tembisa and Daveyton (see figure 7). This suggests the possible presence of another factor or mediating variable at play in these few low-fee, low quintile schools.

Teacher-to-learner ratios have a negative correlation ( $r=-0.4$ ;  $p<0.0001$ ;  $n=561$ ) to matriculation pass rates. That is, schools with low teacher-to-learner ratios produced better matriculation pass rates than those with higher ratios. In particular, schools with a teacher-to-learner ratio of 1 : 23 or less had matriculation pass rates above 90%, with one outlier, as documented in figure 8.

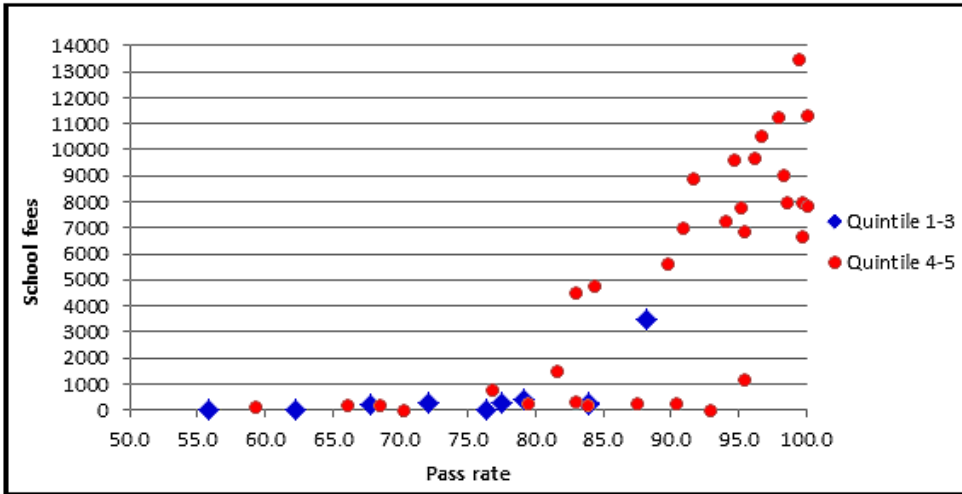


Figure 5: Correlation between matriculation pass rates and school fees by quintile ranking

Overall, geographic location has a strong relationship with performance. The best-performing schools are located in former white neighbourhoods (see figure 6).

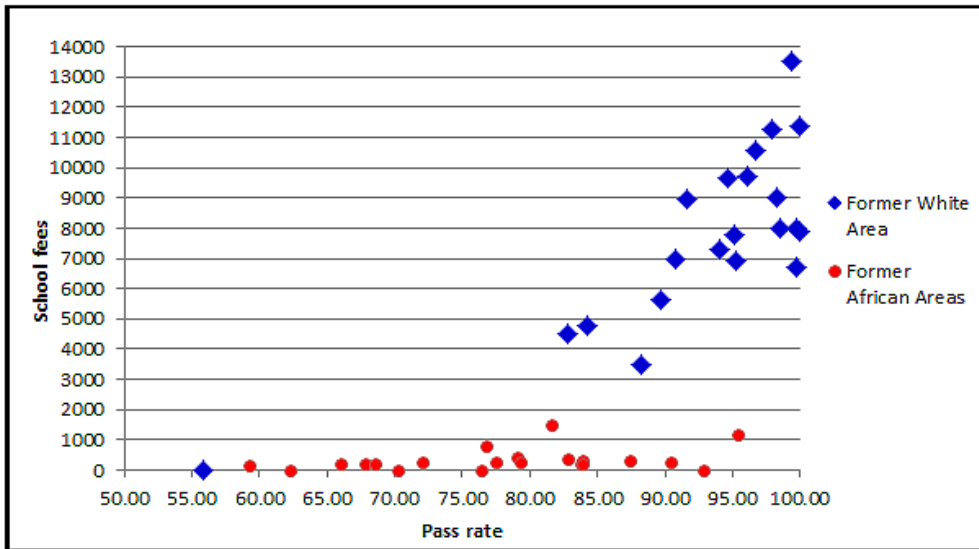


Figure 6: Correlation between matriculation pass rate, school fees and geographic area

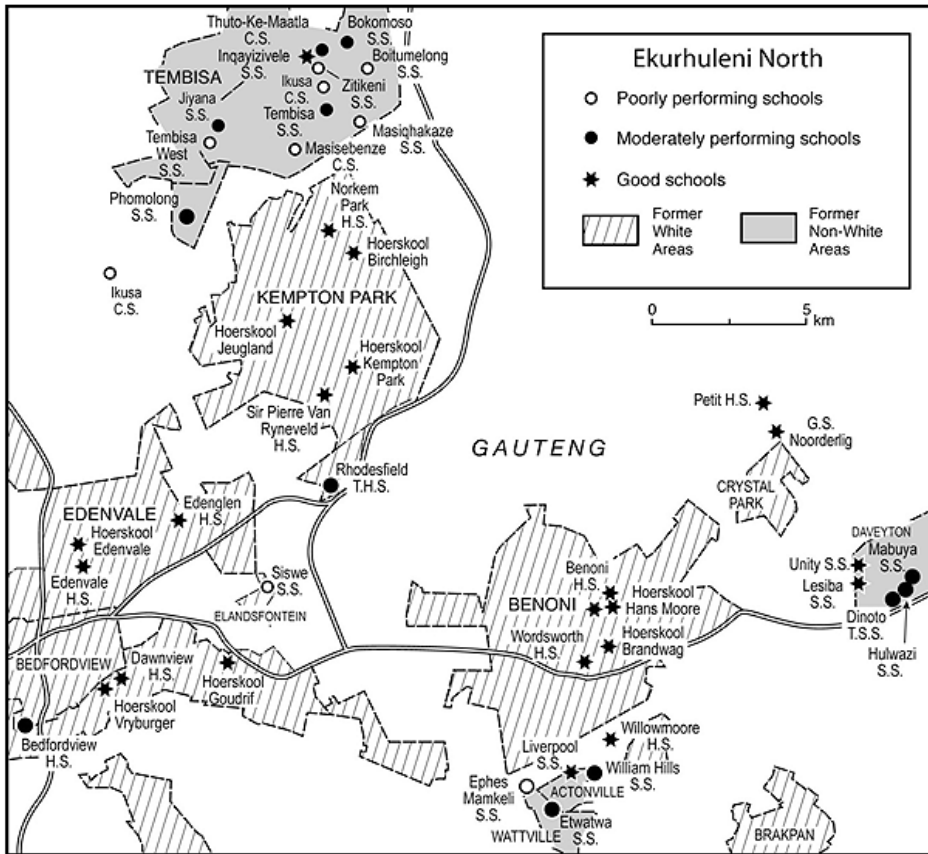


Figure 7: Distribution of schools by matriculation pass rates and former apartheid spatial zoning

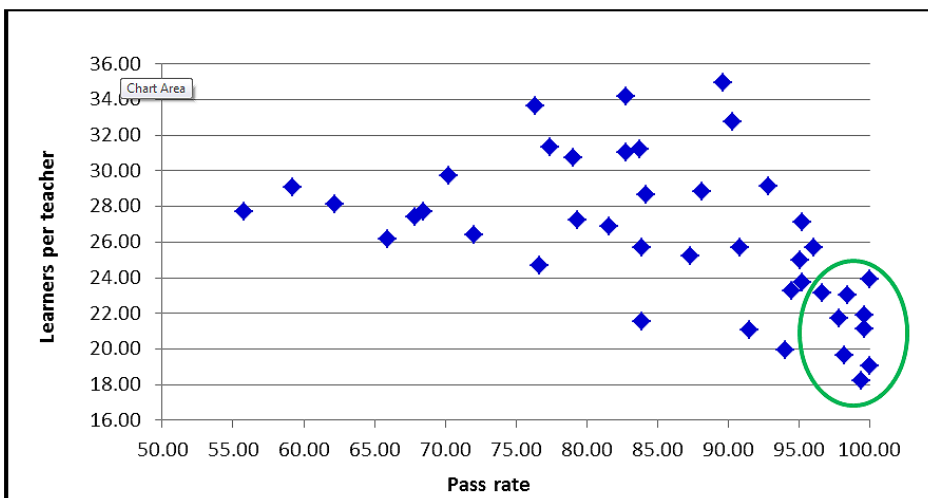


Figure 8: Correlation between matriculation pass rate and teacher-to-learner ratios

## **Overall findings for Gauteng**

We believe, like Fleisch (2008), that all children have the potential to achieve, so the uneven geographic distribution of matriculation achievement revealed here should not occur. For Gauteng, it is clear that, for many learners, their neighbourhood school is not one that is likely to prepare them to perform well in the matriculation examinations. The highest matriculation pass rates (85% or more) are generally found in quintile 4 and 5 schools located in former white geographic areas and it is most likely that this finding is the drive behind the school commute and/or causing parents to move house to access such schools. Such a finding has implications for Gauteng's catchment zoning policy. Schools that are performing well in African areas may also be driving the intra-township commute documented by Sekete *et al.* (2001).

This study confirms the significant role that resources play in matriculation pass rates, supporting the work of Fleisch (2008) and van der Berg and Louw (2007). In addition, matriculation pass rates are influenced positively by teacher-to-learner ratios, that is, small class sizes generally result in better matriculation pass rates. In particular, schools posting matriculation pass rates above 95% usually had a teacher-to-learner ratio of less than 1 : 25. School fees also have a positive impact on matriculation pass rates. In particular, schools charging over R6 500 all had good matriculation pass rates. Schools charging relatively high school fees had lower teacher-to-learner ratios, so we speculate that school fees are used to employ additional teachers. It is clear that, on the whole, the resources allocated by the state to schools under the current public funding system is insufficient to enable matriculation pass rates to improve across the board. In general, schools who are achieving good matriculation pass rates are doing so by 'topping up' state funding through collection of school fees.

## **Recommendations**

The results of this study show that teacher-to-learner ratios affect matriculation performance. Class size, therefore, needs to be managed actively. In line with the recommendations of Peters and Hall (2004) and Davidoff and Leigh (2007), additional state funds will have to be provided to poorly resourced schools if matriculation pass rates are to improve.

It further seems that the quintile rankings of some schools may need to be investigated, as some may be incorrectly assigned a higher quintile rank. This is especially true for Johannesburg Central schools. In addition, the practice of geographic catchment zoning may need scrutiny, as it is inhibiting learner choice. With regard to research recommendations, exploring the relationship between school fees, teacher-to-learner ratios and academic success could be extended to primary schools, using the ANA results. Investigating no-fee schools located in former African areas which are achieving high pass rates could also provide insight into other

factors that may be affecting academic success, such as school management, teacher qualifications, and teacher experience.

Finally, the causal relationship between fees, teacher-to-learner ratios and matriculation pass rates should be investigated. This could be done by unpacking if multi-co-linearity is present so as to determine which factor may spark a virtuous circle and provide a way to systematically improve matriculation pass rates across the board.

## **Conclusion**

The analysis of schools in Gauteng by geographical location, teacher-to-learner ratio, school fees and matriculation pass rates has demonstrated that poor education performance in the province can, in part, be attributed to both past historical legacies of inequality and post-1994 funding decisions. The legacy of apartheid is still embedded in our society as schools located in former African areas consistently underperform compared to schools in former white areas. However, policies relating to investment in school resources post-1994 mean that many schools are still under resourced. Their inability to raise school fees to make up for the lack of state investment is hampering their ability to offer quality education to their learners, in particular, to hire SGB teachers in order to reduce their teacher-to-learner ratios. It seems that schools located in former white areas have not only inherited significant resources from the apartheid era; the neighbourhoods they are located in enable them to levy school fees with which they are able to keep matriculation pass rates high.

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