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## **Educational inequality in Mozambique**

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**Abstract:** In very poor countries, inequality often means that a small part of the population maintains living standards far above the rest. This is also true for educational inequality in Mozambique: only a small segment of the population has access to higher levels of education (there are 30 times as many schools offering grade 1 than grade 12) and receives education of a good quality.

This study investigates inequality in past attainment, in current school access, and learning or educational quality, by gender, geography and parental socio-economic status. Survey and census data measure attainment and access, while a grade-3 Portuguese test and 2007 SACMEQ tests measure quality.

While the gender gap in access has been closed, large geographical and wealth inequalities remain. The South—particularly Maputo City—is far better served than other regions or provinces, while richer children remain in school longer. The overall weakness of the school system limits its ability to overcome these inequalities.

**Key words:** education, economic development, inequality, poverty, Mozambique

**JEL codes:** I21, I24, O1, O15

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## 1 Introduction

Mozambique is one of the world's poorest countries. Educational access is still low, despite the introduction of free primary education more than a decade ago. Many children are still out of school, and those who do attend often enter late or progress slowly through the education system, with immense drop-out occurring before the secondary phase of education. In addition, amongst those children who are at school, levels of cognitive development are quite low as a result of poor quality of education. Data from the SACMEQ educational evaluations at grade-6 level in some 15 countries of southern and eastern Africa confirm this. Kotzé and Van der Berg (2017, unpublished) have also shown that Mozambican students in grade 6 perform weakly when measured against the 12 SACMEQ<sup>1</sup> and SERCE (Latin American) countries that they have investigated, though at comparable levels of income not as weakly as a handful of countries in these educational evaluations.

In a country in which poverty is as endemic as in Mozambique, inequality largely asserts itself in the form of a relatively small part of the population who maintain living standards far above those of the mass of the population. This is also the way that educational inequality reveals itself: only a small segment of the population has access to higher levels of education and receives education of a good quality.

Current educational inequality in Mozambique cannot be separated from its past. Colonialism and the civil war both left a large imprint on current society and particularly on education and its distribution. At the end of the colonial period, only a small part of the population was equipped with the skills to participate in a modern economy and administration. The civil war lasted from shortly after independence in 1975 to the signing of a peace treaty in 1992, and left devastation in its wake. Hanlon (1997: 14) estimated that the war caused about 1 million deaths, and that about 4.7 million people fled the war, most of them relocating in other parts of the country but as many as 1.7 million migrating to neighbouring countries.

An additional impact of the war was on school infrastructure. According to the Ministry of Education (1996: 40), the war led to the destruction or closure of 58 per cent of schools. This affected those regions most which had lagged behind historically in terms of education. Almost 82 per cent of all schools in the Central Region were destroyed or closed between 1983 and 1992 (Table 1). The effect was especially severe in Tete (95 per cent destroyed or closed) and Zambézia (88 per cent). In contrast, in Maputo City no schools were destroyed or closed.

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<sup>1</sup> SACMEQ, the Southern and Eastern Africa Consortium for Monitoring Education Quality, is a consortium involving 15 ministries of education in 14 countries located in Southern and Eastern Africa (Mainland Tanzania's education system is evaluated separately from that of Zanzibar). The SACMEQ studies involve the collection of data on background characteristics, access to school resources, and access to public services at the pupil (grade 6), teacher and school levels. Pupils and teachers were required to write standardized tests on Reading and Mathematics.

Table 1: Impact of the civil war on the destruction of the school network

Province /Region	Schools		
	Existing in 1983	Destroyed or closed by 1992	
		Number	%
Niassa	508	352	69%
Cabo Delgado	542	109	20%
Nampula	1 116	535	48%
Zambézia	1 130	997	88%
Tete	479	454	95%
Manica	225	109	48%
Sofala	386	253	66%
Inhambane	506	220	44%
Gaza	546	169	31%
Maputo Province	339	204	60%
Maputo City	109	0	0%
Total	5 886	3 402	57.8%
Northern Region	2 166	996	46.0%
Central Region	2 220	1 813	81.7%
Southern Regions	1 500	593	39.5%
Total	5 886	3 402	57.8%

Source: Authors' own calculations, adapted from Ministry of Education (1996: 40)

This left a large part of the population with little education. The World Bank (2012) noted that 'five years after the peace treaty, 80 per cent of the labor force reported to have no education at all', and that enrolment levels outside the main cities were very low.

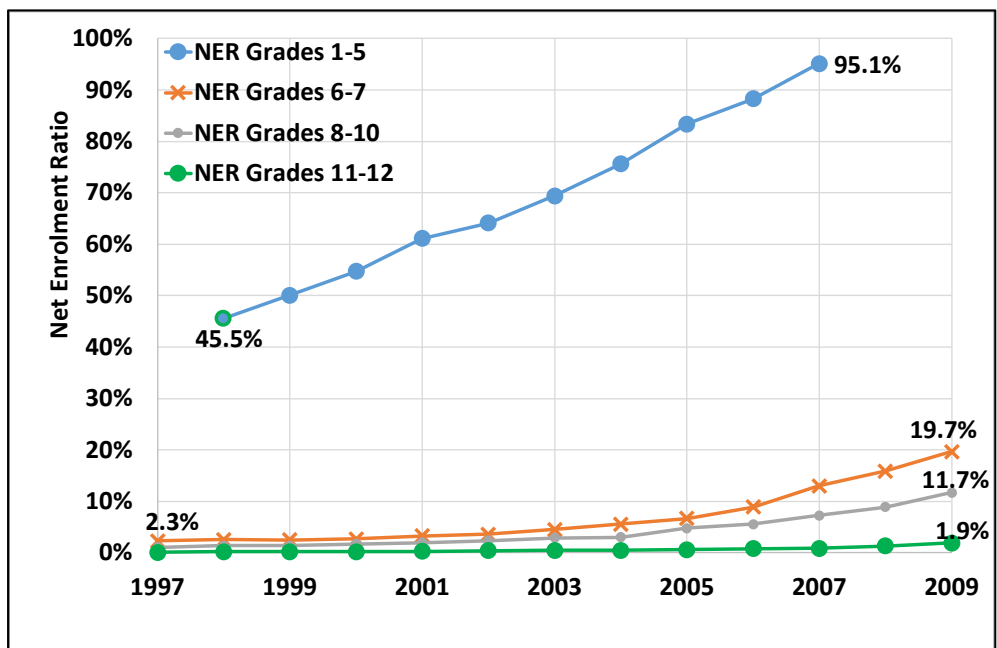
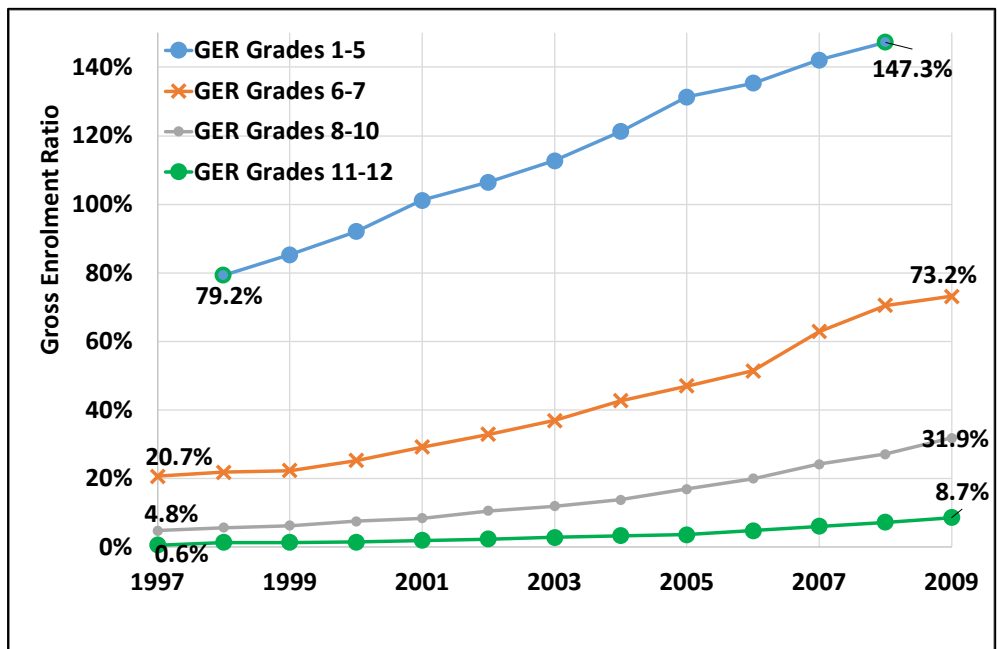
Both the first two development plans following the war, PARPA<sup>2</sup> (from 2001 to 2005) and PARPA II (2006–2009), emphasised the role of education as a central pillar in poverty reduction. Achieving universal primary education was the main education objective. Following reforms to make all primary schooling free, school fees decreased significantly between 2003 and 2008 (Fox et al. 2012), yet voluntary contributions were often imposed, thus limiting the effect of the reduction of the compulsory fees.<sup>3</sup> Education quality received greater emphasis in PARPA II.

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<sup>2</sup> *Plano de Acção para a Redução da Pobreza Absoluta* - Action Plan for the Reduction of Absolute Poverty

<sup>3</sup> See also World Bank and UNICEF (2009) for a more detailed analysis of the implementation of Free Primary Education in Mozambique.

Figure 1 – Gross Net Enrolment Ratios (Panel A) and Net Enrolment Ratios (Panel B), 1997 to 2009



Source: Da Maia (2012), adapted using data from Mozambique Education Statistics 1998–2009. (The figure is reproduced here with permission from the University of Stellenbosch, copyright holder of the thesis.)

Table 2: Gross and net enrolment ratios according to Ministry of Education data, 1997–2009

	Gross enrolment ratio (GER)				Net enrolment ratio (NER)			
	GER Grades 1-5	GER Grades 6-7	GER Grades 8-10	GER Grades 11-12	NER Grades 1-5	NER Grades 6-7	NER Grades 8-10	NER Grades 11-12
1997		20.7%	4.8%	0.6%		2.3%	1.1%	0.1%
1998	79.2%	21.9%	5.7%	1.4%	45.5%	2.6%	1.4%	0.2%
1999	85.3%	22.4%	6.3%	1.4%	50.1%	2.5%	1.4%	0.2%
2000	92.1%	25.3%	7.6%	1.5%	54.7%	2.7%	1.7%	0.2%
2001	101.2%	29.2%	8.5%	2.0%	61.1%	3.3%	2.0%	0.3%
2002	106.5%	32.9%	10.6%	2.4%	64.1%	3.6%	2.4%	0.4%
2003	112.7%	36.9%	12.0%	2.9%	69.4%	4.5%	2.9%	0.5%
2004	121.2%	42.7%	13.8%	3.4%	75.6%	5.6%	3.0%	0.5%
2005	131.3%	47.0%	17.0%	3.7%	83.4%	6.7%	4.8%	0.6%
2006	135.3%	51.4%	20.0%	4.8%	88.3%	8.9%	5.6%	0.8%
2007	142.1%	62.9%	24.2%	6.1%	95.1%	13.0%	7.3%	0.9%
2008	147.3%	70.5%	27.2%	7.3%	15.9%	8.9%	8.9%	1.3%
2009		73.2%	31.9%	8.7%		19.7%	11.7%	1.9%

Source: Da Maia (2012), adapted using data from Mozambique Education Statistics 1998–2009. (The table is reproduced here with permission from the University of Stellenbosch, copyright holder of the thesis.)

Mozambique endorsed the *Education for All* (EFA) global agenda. Along with the need for catching up after the war, this meant very sharp increases in enrolments. The gross enrolment rate<sup>4</sup> (GER) in the lower primary (grades 1 to 5) rose from 79 per cent to 147 per cent between 1998 and 2008. The GER also rose strongly for upper primary as well as both lower and upper secondary education, as the table and Figure 1A show. Note though that at higher education levels the GER is not particularly high, though it rose over the period considered.

The net enrolment rate (NER) is a more restricted measure that considers only children from the appropriate age group in the numerator. It is the number of children of the appropriate age group being in the grades considered or even higher grades, divided by the children of that age group in the population. For junior primary, the NER is thus the proportion of junior primary aged children that are actually at junior primary or above. The NER at Junior Primary level more than doubled from almost 46 per cent in 1998 to 95 per cent in 2008, reflecting a rapid expansion of these grades. Note in Table 2 and Figure 1B, however, that the NER for the other school phases, though rising, were still quite low at the end of the first decade of this century. High repetition rates more than late enrolment rates were the main reason for this, with children repeating often and in many cases dropping out before reaching the higher grades.

The GERs and NERs in the table and figures shown were calculated by the Ministry of Education based on enrolment data from the school level for the numerator and population estimates for the

<sup>4</sup> The gross enrolment rate (GER) is the number of children, irrespective of age, in grades associated with a particular age group, divided by the number of children of that age group in the population. Thus, for instance, the lower primary GER is the number of children in the lower primary grades divided by the number of children aged 6 to 11. If there are many over-aged or under-aged children in these grades, the GER can be higher than 100%. This indeed became the case for lower primary education largely because of late entry to school and repetition in these grades, leading to many older children being part of the numerator.

denominator. More recent data will be shown later in this paper where both numerator and denominator are taken from survey data.

Comparison of data from the SACMEQ surveys of 2000 and 2007 respectively show the effect of the rising enrolment in grade 6, and also allows a perspective on regional enrolment and provincial trends, albeit only at the upper primary level. The number of grade-6 students increased from 122,338 to 319,243, an increase of 161 per cent over the period or 14.7 per cent per year (Table 3). In both the North and the Central region—which had the largest backlogs—enrolment increased more than threefold, and even in the South enrolment doubled. The provinces recording the largest increases were Cabo Delgado (a staggering 24.1 per cent per annum), Zambézia (19.0 per cent p.a), and Inhambane and Tete (both at 18.3 per cent p.a.)

Table 3: Number of grade-6 pupils in Mozambique, 2000 and 2007

<b>Provinces/ Regions</b>	<b>SACMEQ II 2000</b>	<b>SACMEQ III 2007</b>	<b>%-change 2000 to 2007</b>	<b>Annual rate of change</b>
<b>Niassa</b>	5 317	13 944	162%	14.8%
<b>Cabo Delgado</b>	4 660	21 184	355%	24.1%
<b>Nampula</b>	14 514	40 692	180%	15.9%
<b>Zambézia</b>	13 722	46 396	238%	19.0%
<b>Tete</b>	7 269	23 561	224%	18.3%
<b>Manica</b>	7 986	23 786	198%	16.9%
<b>Sofala</b>	9 192	29 861	225%	18.3%
<b>Inhambane</b>	12 531	29 935	139%	13.2%
<b>Gaza</b>	12 063	27 059	124%	12.2%
<b>Maputo Province</b>	10 257	32 397	216%	17.9%
<b>Maputo City</b>	24 827	30 429	23%	2.9%
<b>Total</b>	<b>122 338</b>	<b>319 243</b>	<b>161</b>	<b>14.7%</b>
<b>Northern Region</b>	24 491	75 820	210%	17.5%
<b>Central Region</b>	38 169	123 604	224%	18.3%
<b>Southern Regions</b>	59 678	119 820	101%	10.5%
<b>Total</b>	<b>122 338</b>	<b>319 244</b>	<b>161%</b>	<b>14.7%</b>

Source: Derived from SACMEQ II and SACMEQ III

Unicef (2017) writes that “The abolition of school fees in 2003/04 and provision of direct support to schools and free textbooks, along with investments in classroom construction and teachers, resulted in a surge in primary and secondary school enrolments from 3.6 million in 2003 to around 6.7 million by 2014. .... Intake of children aged 6 years old has significantly improved up to over 80 per cent. Gender parity in primary and secondary enrolment has also improved.’

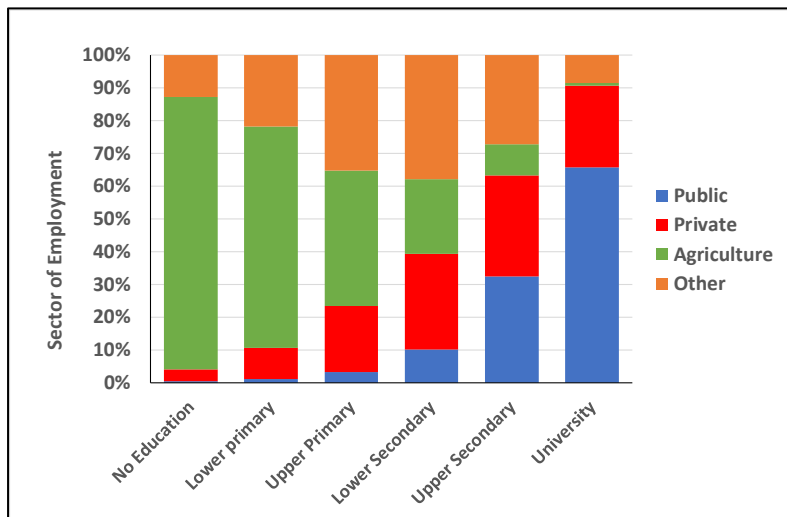
While increased access to education is in itself desirable, such rapid expansion of enrolment is likely to have had affected education quality. Indeed, as discussed later in this paper, the average quality of education as measured by performance of grade-6 pupils in SACMEQ deteriorated. This could have been the result of resource pressure, or the effect of more poor children entering schools. If the deterioration in education quality affects some groups more than others, it might also have an effect on inequality. This paper returns to this issue when analysing the SACMEQ results.

## 1.1 Education and well-being

Education's effect on living standards works particularly through the labour market, as more educated people more easily find better-earning jobs. However, as in many other very poor countries, Mozambique's labour market is highly segmented. Most members of the labour force work in subsistence agriculture and informal activities rather than in the wage sectors (either public or private wage employment). In such countries, the public sector often provides most of the best jobs, and better educated people are more able to compete for such jobs. Therefore, as da Maia (2012) indicated: 'if disadvantaged groups such as people in the civil war's most affected provinces have fewer opportunities to access quality education, they will also have fewer opportunities of escaping poverty. Those in Maputo City, however, who were barely affected by the war and who had access to the best schools, had better chances of escaping poverty.'

Figure 2 shows how strongly the level of education people have attained is reflected in the parts of the labour market they access. As a person's education level rises, he or she becomes commensurately more likely to find a wage job in the private sector or, even more attractively, in the public sector, and far less likely to work in agriculture.

Figure 2: Level of education and position in the labour market, 2014/5



Source: Authors' illustration based on Mozambique Income and Expenditure Survey 2014/15

## 1.2 The approach of this paper

To investigate educational inequality in Mozambique, at least three routes are open. The first is to investigate attainment (year of education completed) of the population across geographic space (provinces and urban-rural) and also for different levels of parental socio-economic status<sup>5</sup>. This part of the study will require data from household surveys or censuses. (The DHS is often used for this purpose). The second route of investigation will again use survey or census data. In this case, school access is measured for children of school age, across geographic space and parental socio-economic status, as well as by gender. The third route for investigating educational inequality in Mozambique is by investigating cognitive performance on the 2016 grade-3 Portuguese test and the 2007 SACMEQ tests.

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<sup>5</sup> Parental status can however only usefully be considered for children still of school age, as migration away from their families of origin makes it difficult to link adults to their household of origin.



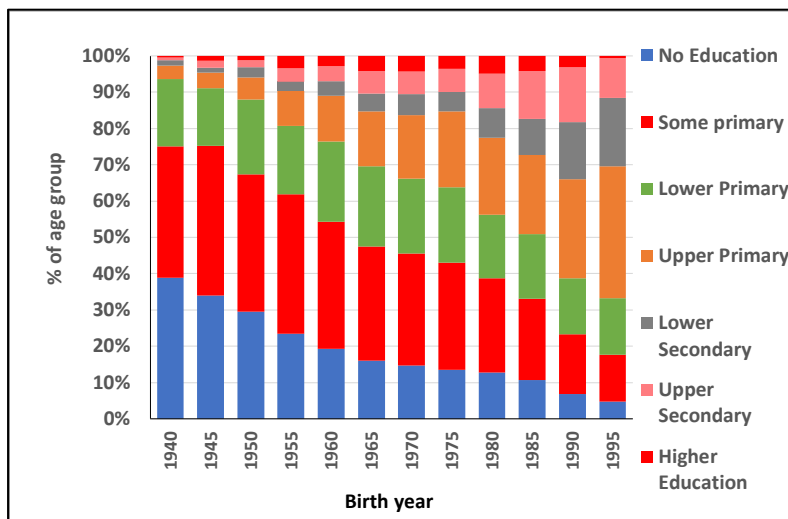
## 2 Inequality in school access and progression through schools

### 2.1 Historical patterns of access to school based on census data

The number of years of education (successfully) completed, or educational attainment, is often taken as a measure of education. This is not an invalid measure, where quality of education is relatively consistent or varies only a little and then largely varies randomly. In most cases, it is the obvious place to start to measure the level of education of a nation. Figure 3 is one way of looking at attainment over time, considering the levels of attainment of the population participating in the 2007 census.<sup>6</sup>

Figure 3 shows that most Mozambicans born around 1940 had no education at all, and the other 15–20 percent had only some primary education. Yet over time, the proportion without any education declined whilst first primary and later also lower secondary education expanded. It is interesting to note that even for the cohorts who would have entered school during the civil war, there was nevertheless continuation of access to schooling: the proportion that never went to school continued to decline, though at a slower pace.

Figure 3: Level of education reached by birth year based on 2014/15 survey

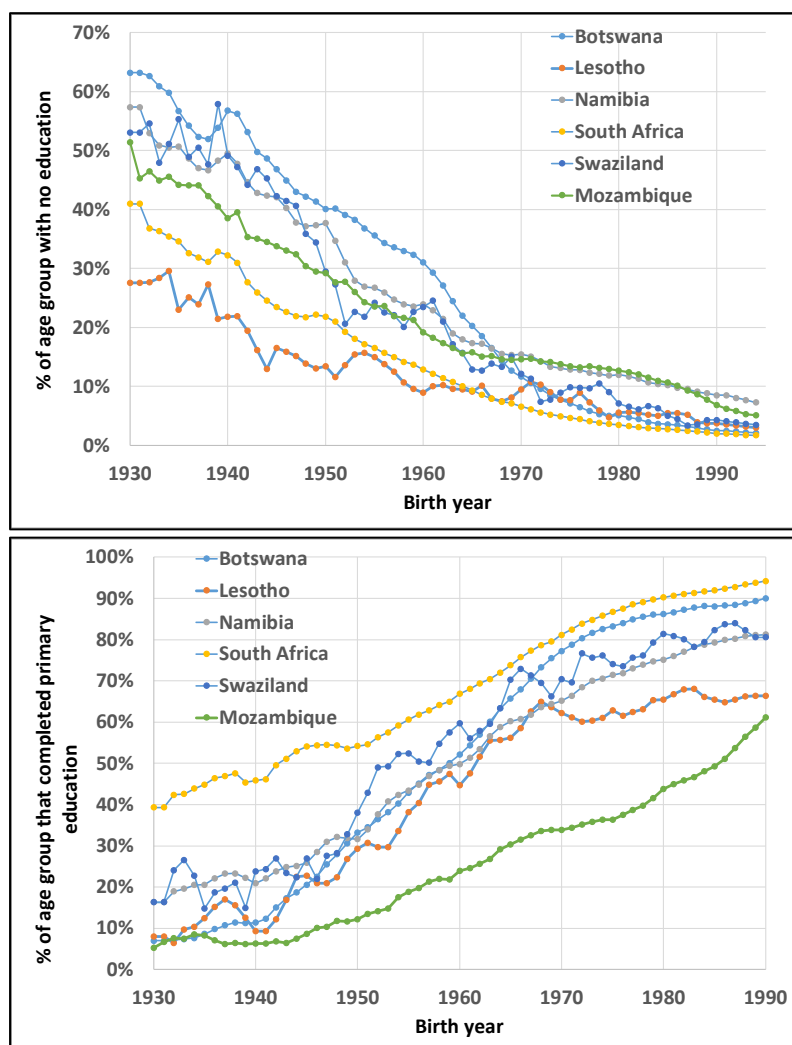


Source: Authors' illustration based on Mozambique Income and Expenditure Survey 2014/15

Panel A of Figure 4 shows that Mozambique's school access is very low in regional context. In all five countries of the South African Customs Union (Botswana, Lesotho, Namibia, South Africa and Swaziland), a far smaller proportion of children have never had access to schools than in Mozambique, and this gap was already large in 1930. Panel B of the same figure shows some progress relative to the other five countries in the proportion of Mozambican cohorts that have completed primary school (grade 7), after this gap had widened for decades.

<sup>6</sup> This may not be completely accurate for the older population, however, as survival to higher ages was non-random and likely to be lower in parts of the community that experienced only low levels of education. Thus attainment for older cohorts may be slightly over-estimated using current census or survey data.

Figure 4: Percentage of population never accessing school (Panel A) and completing at least primary school (Panel B) by birth cohort: Mozambique in regional context



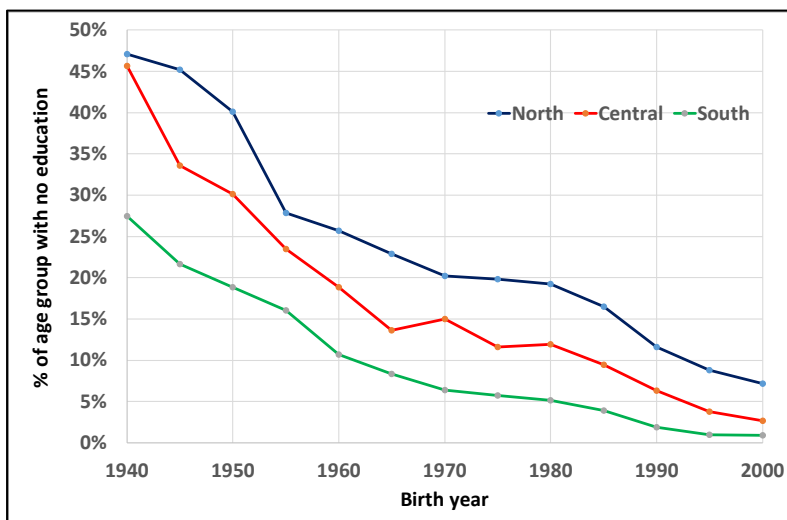
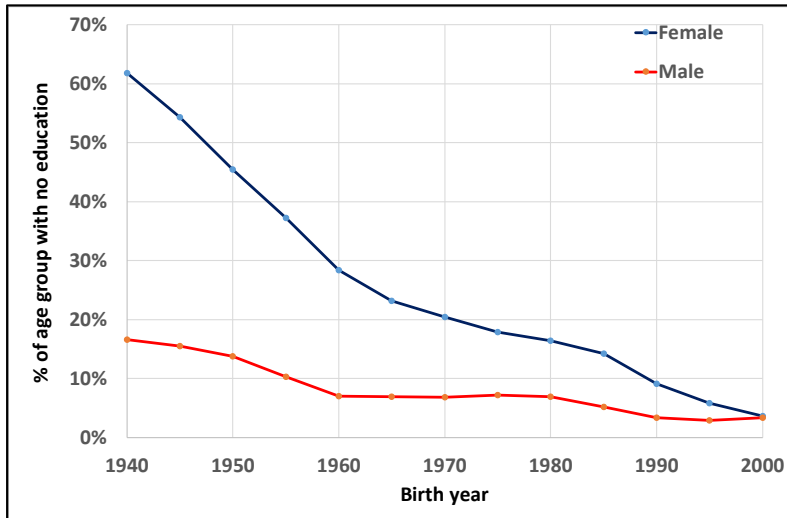
Source: Own calculations from: Botswana, Census 2011; Lesotho, Labour Force Survey 2010; Mozambique Income and Expenditure Survey 2014/15, Namibia, Census 2011; South Africa, Census 2011; Swaziland, Labour Force Survey 2010.

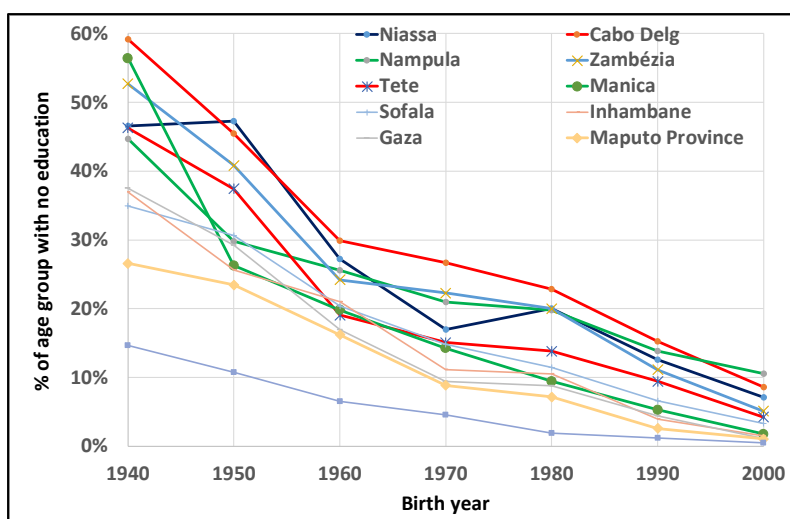
Historical and current inequality in access to schools had a very strong gender dimension, as can be seen in Panel A of Figure 5. These census data show that the gender gap in school access has virtually closed for the cohort born in 1997, after it had been wide for very long. The regression in Table 4 indicates that the gap in school access was very large and on average closed only slowly over time (although the shape of the curve for females shows some non-linearities).

Figure 5 also shows that educational attainment was never equitably distributed over space in Mozambique and that this gap is still large. Naturally, population migration would affect the numbers, but the broad differences between the three major regions are neither new nor surprising. The proportion of cohorts without any education fell in almost similar fashion over the three broad regions, thus the South largely still maintains its large initial advantage that it has maintained from when the cohort born in 1930 went to school and probably even much before. The other two regions perform so similarly on this measure, that they can hardly be distinguished throughout this period of more than 60 years (Figure 5, Panel B). Yet further disaggregation by province shows the huge advantage that Maputo City has, even over the other Southern provinces (Figure 5, Panel C). The proportions who have never been to schools have declined substantially in all provinces. Throughout the period, the province with the second lowest proportion who never attended

school was Maputo Province, followed by some distance by Gaza and Inhambane. Thus provinces located in the Southern region have a long and sustained history of being those where most children access schools. The patterns between provinces in other regions are less systematic.

Figure 5: Percentage of population with no education by birth cohort by gender (Panel A), by main region (Panel B) and by province (Panel C), 2014/15





Source: Authors' illustration, derived from Mozambique Income and Expenditure Survey 2014/15

Table 4: Regression of the probability of not having completed any schooling, based on IOF 2014-2015

Female	0.267*** (0.0050)
(DOB – 1950)	-0.002*** (0.0000)
Female x (DOB – 1950)	-0.005*** (0.0001)
Central	-0.064*** (0.0024)
South	-0.112*** (0.0022)
Constant	0.186*** (0.0036)
Observations	85 706
R-squared	0.106

Notes: Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Own calculations from Mozambique Income and Expenditure Survey 2014/15

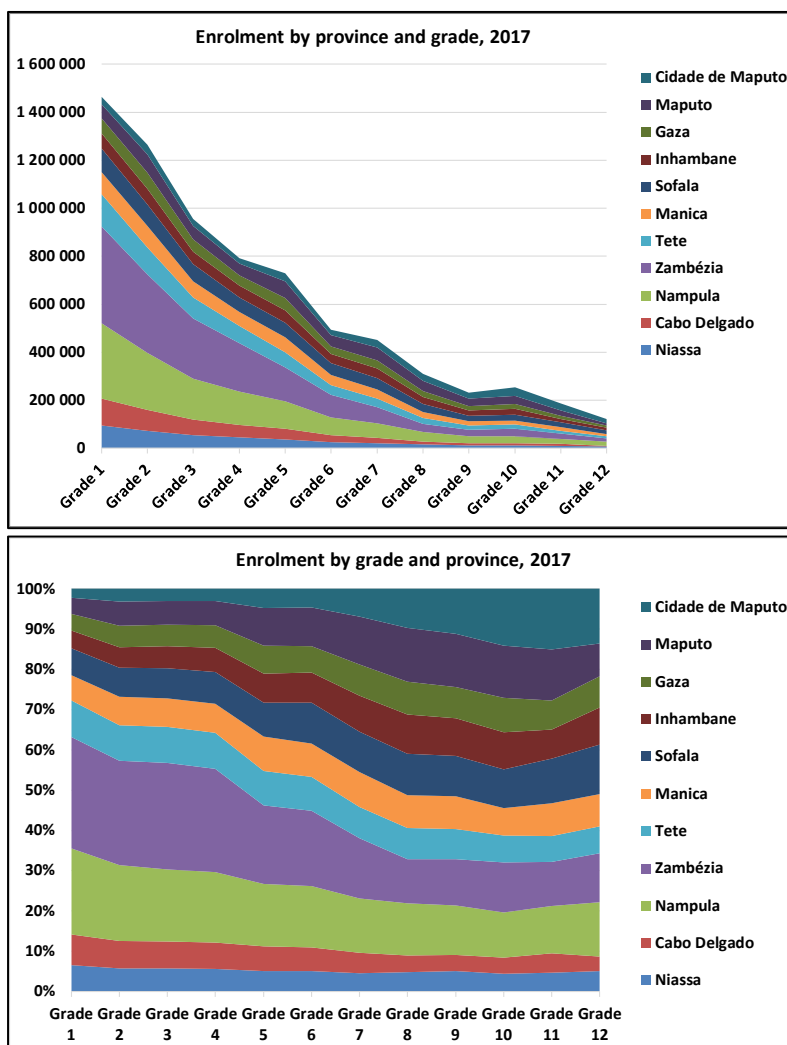
### 3 Enrolment by age and by grade

Enrolment data can be obtained by using either census or survey data, and using data from the annual school census, or EMIS (Education Management Information System). In the latter case, however, nothing is known about those who are out of school. Enrolment data reflect the effect of three flows: School entry (access), repetition (or promotion), and children dropping out of school.

Dropping out of school is very common in Mozambique, as Panel A of Figure 6 demonstrates. Though it only shows enrolment by grade for a single year, 2017, the small numbers reaching the higher grade compared to those in the lower grade give a good perspective on the problem, considering that differences in cohort size over this age range are far smaller than the differences in enrolment by grade. Of course, repetition and slow promotion through the system could account for a part of the large size of enrolment in lower grades and the small magnitude at higher grades, but drop-out is the dominant force.

One of the consequences of variable drop-out and repetition across provinces is that the proportion of national enrolment in the Southern provinces of Maputo City, Maputo province, Gaza and Inhambane is 14.8 per cent in grade 1, yet it peaks at 44.8 per cent in grade 10 (see also Figure 6, Panel B). (The decline thereafter may be due to differential pass rates for potential school leavers).

Figure 6: Enrolment by province, 2017: Panel A – Numbers; Panel B - Percentages

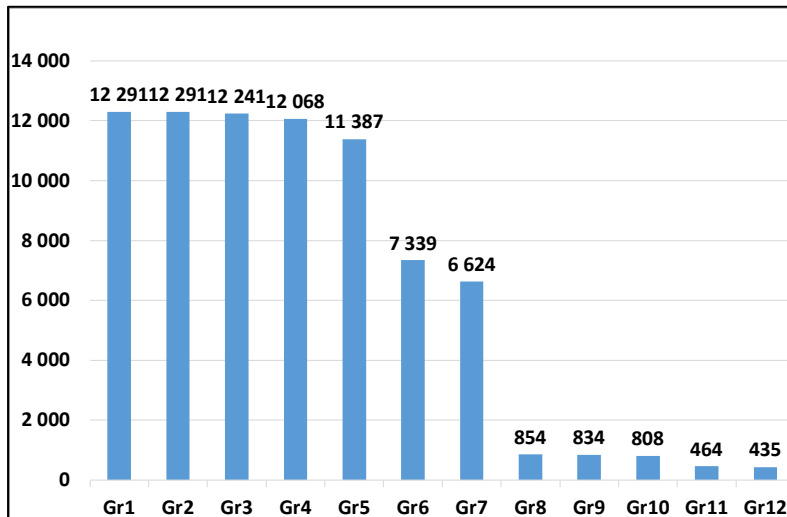


Source: Authors' own calculations based on Annual School Census (EMIS)

It is possible that the large drop-out of children from the early grades from Mozambican schools that Panel A of Figure 7 hints at could result not so much from a low demand of education, but from insufficient supply of opportunities to study. Indeed, Figure 7 provides support for such a perception: while there are more than 9,000 schools in Mozambique that offer the lowest grades, this number dwindles to fewer than about 4,800 in grade 7, just under 600 in grade 10 and only 334 schools that offer grade 12. On average, for every 27 schools offering grade 1 there is only

one offering grade 12. It may simply be that lack of easy access to schools holds back many children who would have continued to higher grades if easy options were available within reasonable distance from their home, or costing less for transport or hostel (boarding school) fees. Unicef (2017) refers to a 2012 UNESCO study that found that 1.2 million (or 23 per cent) primary and secondary school aged children are out of school, of which 775,000 are primary school aged children and nearly 55 per cent are girls.

Figure 7: Number of schools offering various grades, 2017



Source: Authors' own calculations based on Annual School Census (EMIS)

However, there is also clear evidence that the reason why many children are not at school is related to demand constraints, e.g. they or their parents have taken a decision not to attend school. In Mozambique there is some evidence of this for females aged 15 to 25 in two of the Demographic and Health Surveys (see Table 5). Amongst these young women, as many as 28 per cent mentioned as the main reason for not being at school pregnancy or having got married in 1998, a proportion which rose to 40 per cent in the 2003 DHS. (Though the proportion that mentioned pregnancy or marriage as reasons for dropping out rose, this does not necessarily mean that a greater *number* of girls dropped out for these reasons, and those who did drop out may even have done so at higher ages than before.) Their responses show little evidence of supply side constraints – few of these women would have advanced far enough at school to be affected by the scarcity of secondary schools. In a survey in Sofala, Roby, Lambert and Lambert (2009) state that ‘financial constraints were important in keeping children out of school: of all the out-of-school children in the sample, 62 per cent were reported to be not attending due to financial reasons, such as not being able to afford uniforms, books and other supplies.’ Discouragingly, in their survey of caregivers, 61 per cent expressed the belief that education did not hold benefits for their children’s future earning abilities, a belief that was particularly strong where girl children were concerned.

UNICEF (2017) also refers to the 2012 UNESCO study’s findings that ‘factors related to poverty and socio-cultural norms [...] keep children from finishing school, such as early marriage and pregnancy, as well as distance from home to schools, lack of safe school spaces, overcrowded classrooms, and a lack of an adequate number and quality of teachers’. This would indicate that the cause may be a mixture of demand side and supply side factors.

Table 5: Main reason for not studying (sample of females aged 15-25)

	<b>1997</b>	<b>2003</b>
Got pregnant	10.4%	12.1%
Got married	16.7%	27.9%
Take care of children	2.1%	7.0%
Help family	2.8%	2.9%
No money	27.3%	26.0%
Needed to work	1.4%	2.0%
Studied enough	2.1%	1.0%
Did not pass admission	8.0%	0.4%
Does not like to study	6.8%	7.1%
Does not know	22.4%	13.8%
<b>Total</b>	<b>100%</b>	<b>100%</b>

Source: Authors' calculations based on demographic and Health Surveys 1997 and 2003

The enrolment data in Table 6 show a very high pupil-teacher ratio of 51 (including private schools and night shift). There is variation across provinces: the highest ratio of 56 is observed in Nampula and Zambézia, while it is only 43 in Manica and Inhambane. However, the variation at the school level is much larger than that in provinces. This speaks to a problem that is quite large in Mozambique: teachers are in short supply, partly due to budget constraints but also because of the limited availability of adequately qualified individuals who can enter teaching. Evidence from the World Bank's Service Development Indicator report puts this in perspective: only 60 per cent of Mozambican lower primary teachers could give the correct answer to a simple subtraction problem,  $86 - 55$  (Molina and Martin 2015: 14). Obtaining quality teachers is then essential.

In 2007, 47 per cent of teachers in rural areas had no formal qualification, 47 per cent had basic education, and only 1 per cent had higher education. These proportions were 25 per cent, 50 per cent, and 11 per cent respectively in rural areas, i.e. more qualified teachers were concentrated in urban areas (Bilale 2007: 17).

Table 6: Enrolment, teachers and pupil-teacher ratios by province, 2017

	<b>Enrolment</b>	<b>Teachers</b>	<b>Pupil-teacher ratio</b>
<b>Niassa</b>	402 137	8 324	48
<b>Cabo Delgado</b>	457 718	8 720	52
<b>Nampula</b>	1 244 154	22 105	56
<b>Zambézia</b>	1 618 156	28 981	56
<b>Tete</b>	617 175	12 152	51
<b>Manica</b>	538 003	12 546	43
<b>Sofala</b>	592 257	11 727	51
<b>Inhambane</b>	459 336	10 570	43
<b>Gaza</b>	430 388	9 180	47
<b>Maputo</b>	546 133	10 911	50
<b>Maputo City</b>	350 656	7 197	49
<b>Total</b>	<b>7 256 113</b>	<b>142 413</b>	<b>51</b>

Note: Includes private schools and night shifts.

Source: Authors' own calculations from Annual School Census.

In developing country schools, many children are over-aged, i.e. outside the age range usually associated with the grades they attend. The net enrolment ratio is a good way of eliminating the effect of such over-aged (or in a few cases under-aged) children. Net enrolment ratios are calculated as the proportion of children of the appropriate age groups that is at school and in the grades associated with that age group. Thus the net enrolment ratio (NER) for the school phase EP1 is the percentage of children aged 6–11 in grades 1–5; for EP2 it is the percentage of children aged 12–13 in grades 6–7; for ES1 it is the percentage of children aged 14–16 in grades 8–10; and for ES2 it is the percentage of children aged 17–18 in grades 11–12. The DHS surveys provide information that allows calculating these rates for 1997, 2003 and 2011. Table 7 shows these rates by gender and also by region, whilst Table 6 illustrates it by wealth quintiles. What is apparent is the low levels of net enrolment at the higher levels, reflecting both drop-out and slow promotion to the higher grades, as the net enrolment ratio penalizes a situation where children are not in the correct phase for their age. What also emerges is that the further children advance in school, the greater the differences by gender, region and quintile. There are still very large regional differences in enrolment rates, as evident from the ratios in the last two lines of the table. For instance, in 2011 the net enrolment rate in the Northern region in EP2 was only 38 per cent of that in the South, and the Central region was only marginally better off with an enrolment ratio 41 per cent of that in the South.



Table 7: Net enrolment rates in primary and secondary schools by gender and by region, and gender and regional inequality, 1997, 2003, 2011

	Primary (EP1)			Primary (EP2)			Secondary (ES1)			Secondary (ES2)		
	1997	2003	2011	1997	2003	2011	1997	2003	2011	1997	2003	2011
<b>GENDER</b>												
Female	48.4%	53.3%	67.3%	8.8%	9.0%	25.1%	1.9%	6.9%	21.3%	0.0%	1.2%	4.8%
Male	53.9%	59.7%	66.9%	8.3%	11.4%	23.4%	1.7%	7.4%	19.9%	0.1%	1.3%	6.4%
Ratio Female/Male	90%	89%	101%	107%	79%	107%	108%	93%	107%	-	88%	75%
<b>REGION</b>												
North	44.6%	45.5%	61.5%	6.5%	6.3%	15.5%	0.5%	4.6%	10.9%	0.0%	0.5%	3.9%
Central	42.2%	56.6%	66.5%	8.8%	10.8%	23.1%	1.3%	4.8%	18.2%	0.1%	0.9%	4.2%
South	67.0%	79.9%	80.3%	11.4%	17.5%	43.9%	3.5%	12.7%	39.1%	0.0%	2.5%	10.3%
National	51.1%	56.5%	67.1%	8.6%	10.2%	24.3%	1.8%	7.2%	20.6%	0.0%	1.3%	5.6%
Ratio North/South	67%	57%	77%	57%	36%	35%	14%	36%	28%	-	21%	38%
Ratio Central/South	63%	71%	83%	77%	62%	53%	36%	37%	47%	-	36%	41%

Note: The NER for EP1 is the percentage of children aged 6–11 in grades 1–5; for EP2 it is the percentage of children aged 12–13 in grades 6–7; for ES1 it is the percentage of children aged 14–16 in grades 8–10; and for ES2 it is the percentage of children aged 17–18 in grades 11–12.

Source: Authors' own calculations based on DHS surveys.

These data also indicate that there has not been substantial progress in enrolment at higher grade levels. Unicef (2017) notes that primary completion rates that initially increased rapidly from a low base have been stagnant at around 47 per cent, due to persistently high rates of drop-out and repetition. Worryingly, the wealth gap (measured by either the ratio of enrolment rates of the lower quintiles or by a concentration coefficient) is rising in upper secondary school, implying greater drop-out or lower progression amongst poorer children (Table 8).

Table 8: Net enrolment rates in primary and secondary schools by wealth quintile, 1997, 2003, and 2011

Level & year	Q1-3	Q4	Q5	National	Ratio (Q1-3)/Q5	Ratio Q4/Q5	Concentration index
<b>Primary schools</b>							
<b>EP1</b>							
1997	39.4%	60.7%	77.5%	53.9%	51%	78%	17%
2003	45.0%	67.4%	85.0%	59.7%	53%	79%	16%
2011	60.0%	75.9%	82.4%	66.9%	73%	92%	8%
<b>EP2</b>							
1997	4.2%	11.0%	18.3%	8.6%	23%	60%	38%
2003	3.4%	9.6%	30.5%	10.2%	11%	31%	52%
2011	11.1%	34.0%	51.3%	24.3%	22%	66%	40%
<b>Secondary schools</b>							
<b>ES1</b>							
1997	0.1%	1.4%	5.4%	1.8%	2%	26%	77%
2003	1.3%	4.3%	21.0%	7.2%	6%	20%	62%
2011	6.0%	20.9%	52.3%	20.6%	11%	40%	51%
<b>ES2</b>							
1997	0.0%	0.0%	0.1%	0.0%	0%	0%	40%
2003	0.1%	0.8%	3.5%	1.3%	3%	23%	77%
2011	0.3%	5.0%	16.0%	5.6%	2%	31%	68%

Note: The NER for EP1 is the percentage of children aged 6–11 in grades 1–5; for EP2 it is the percentage of children aged 12–13 in grades 6–7; for ES1 it is the percentage of children aged 14–16 in grades 8–10; and for ES2 it is the percentage of children aged 17–18 in grades 11–12.

Source: Authors' own calculations based on DHS surveys.

## 4 Inequality in educational quality

In a country that has an immense task to try to accommodate the vast expansion that free primary education brought, and also attempting to achieve far larger flows of pupils through to higher education levels, it is not a surprise that quality may suffer. Yet often the lack of quality in education is the source of the greatest inequality.

Unicef (2017) states in this regard: 'Low learning achievement in primary schools in Mozambique is also a cause of great concern. A national assessment of learning achievement found that on average fewer than one out of ten children in grade 3 have basic reading competencies. The national study indicated that there are links between low learning and key-issues such as teacher absenteeism, teacher capacity, school management, the use of Portuguese as a language of instruction and uncondusive learning environments.'

### 4.1 Inequality in the quality of education

In 2016, a sample of children in grade 3 in all Mozambican provinces wrote a Portuguese comprehension test. The results of this test have been extensively reported on by INDE (2017), the Instituto Nacional de Desenvolvimento da Educação of the Ministry of Education and Human Development. This test will first be discussed as one measure of the quality of education before an analysis follows on performance in the SACMEQ II and SACMEQ III tests.

### *The grade-3 Portuguese test*

In the grade-3 test, the intraclass correlation coefficient (the proportion of the variation between schools as proportion of overall variation in scores) declined from 0.47 in the 2013 test to 0.42 in the 2016 version. Inequality declined both within and between schools, but neither of these declines were statistically significant. The larger decline in variation between schools led to the decline in the overall intraclass correlation coefficient (INDE 2017: 12, 22). This is nevertheless still high compared with the value for Reading in SACMEQ III, which was 0.30 (INDE 2017: 83). One possible explanation could be that variation between schools is smaller at higher grades, implying smaller inequality higher in the education system, perhaps because weaker performing children may already have dropped out or repeated.

Scores in the 2016 grade-3 test in Portuguese, a test counting 24 marks, are converted into four levels of performance. Level 3, the highest level, is attained by those who score at least 21 out of 24 in the test, Level 2 for a score of at least 14 but below Level 3, Level 1 is for a score of at least 9 but below Level 2. Those below Level 1 then constitute the fourth group, who do not meet even the minimal criteria. In Panel A of Figure 9 it can be seen that performance in the South far exceeds that in the other two regions, with 7 per cent attaining Level 1 and 56 per cent at least Level 2 performance. The Central region also performs better than the North if one considers the proportion of test takers in Levels 3 or 2 (45 per cent in Central, 28 per cent in the North).

However, this does not take into account those that were absent, and these were indeed large numbers, particularly in the Central region. Such absentees might be absent precisely because of the test, thus creating sample selection bias. It is telling that in one quarter of all the schools tested, at least half of the students to be tested were absent. This 50 per cent absenteeism rate was also experienced in 25 per cent of the schools in the Northern region, a full 33 per cent of schools in the Central region, but in not a single school in the Southern region. Furthermore, due to some children being out of school (those who never enrolled or have dropped out), performance in the test paints a still too rosy picture of actual performance.

In Panel B of Table 8 the absent group is also identified. Only a very small segment of all pupils, including absentees, in Northern and Central regions reach at least Level 2, at 19 per cent and 28 per cent, as against 53 per cent in the South. The advantage of the South is indeed massive.

Table 9: Grade 3 Performance on Portuguese test, excluding and including absentees, 2016

	North	Centre	South	Total
<b>Levels (excluding absent children)</b>				
<b>Level 0</b>	22%	16%	11%	16%
<b>Level 1</b>	49%	39%	33%	40%
<b>Level 2</b>	26%	40%	49%	38%
<b>Level 3</b>	2%	5%	7%	5%
<b>Total</b>	100%	100%	100%	100%
<b>Levels (including absent children)</b>				
<b>Absent</b>	33%	37%	6%	29%
<b>Level 0</b>	15%	10%	10%	12%
<b>Level 1</b>	33%	24%	31%	28%
<b>Level 2</b>	18%	25%	46%	27%
<b>Level 3</b>	1%	3%	7%	3%
<b>Total</b>	100%	100%	100%	100%

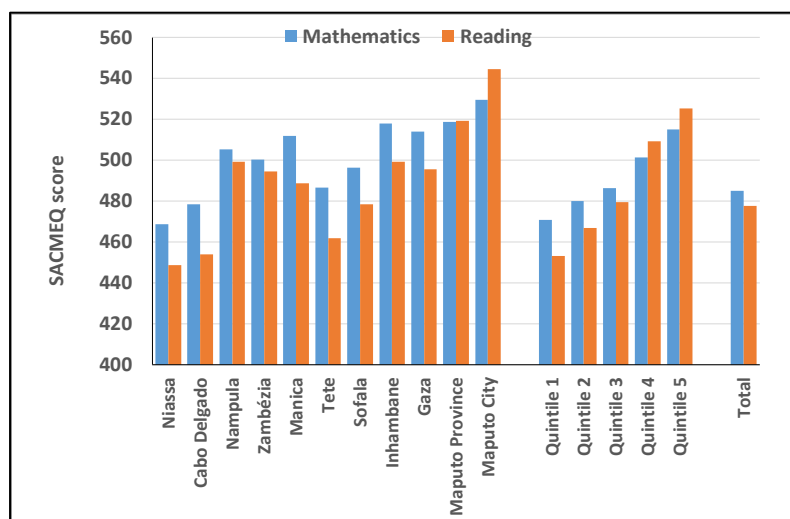
Note: Level 0 is a score of 0 to 7 out of 24, Level 1 a score of 8 to 13. Level 2 a score of 14 to 20 and Level 3 a score of 21 to 24.

Source: Derived from 2016 grade 3 test data

### *Performance on SACMEQ*

Mozambique participated in SACMEQ II (2000) and SACMEQ III (2007). In 2000 the country's students performed slightly above the SACMEQ average (which was set to be 500 for 2000 with a standard deviation of 100). The country occupied the seventh position amongst the 15 SACMEQ countries in the Reading test and fourth and positions in the Mathematics test. In the 2007 survey, however, the average performance of Mozambican grade-6 pupils fell from 517 to 476 in Reading and from 530 to 484 in Mathematics, drawing the country down to near the bottom rank. Standard deviations within Mozambique were 71 and 75 points for the two subjects respectively, which is fairly high, but it is noticeable that the differences in Figure 8 and Table 10 are not particularly large in Mathematics between provinces or between quintiles (60 points and 44 respectively, and only slightly larger in Reading (76 points and 72 points)). It is difficult to determine whether the lower differentials in Mathematics are because teaching in this subject is almost universally weak or because Reading differences are widened by the differences in exposure to an urban environment.

Figure 8: Performance in SACMEQ Mathematics and Reading 2007



Note: The SACMEQ set point was set in 2003 to be 500 with a standard deviation of 100. Scores should thus be interpreted with this in mind. Note that it is not possible to compare performance in Mathematics with that in Reading, except in terms of the performance relative to other SACMEQ countries.

Source: Authors' calculations based on SACMEQ 2007

Table 10: Performance in SACMEQ Mathematics and Reading 2007

	<b>Mathematics</b>	<b>Reading</b>
<b>Niassa</b>	469	449
<b>Cabo Delgado</b>	478	454
<b>Nampula</b>	505	499
<b>Zambézia</b>	500	494
<b>Manica</b>	512	489
<b>Tete</b>	487	462
<b>Sofala</b>	496	478
<b>Inhambane</b>	518	499
<b>Gaza</b>	514	496
<b>Maputo Province</b>	519	519
<b>Maputo City</b>	529	545
<b>Quintile 1</b>	471	453
<b>Quintile 2</b>	480	467
<b>Quintile 3</b>	486	479
<b>Quintile 4</b>	501	509
<b>Quintile 5</b>	515	525
<b>Total</b>	485	478

Note: The SACMEQ set point was set in 2003 to be 500 with a standard deviation of 100. Scores should thus be interpreted with this in mind. Note that it is not possible to compare performance in Mathematics with that in Reading, except in terms of the performance relative to other SACMEQ countries.

Source: Authors' calculations based on SACMEQ 2007

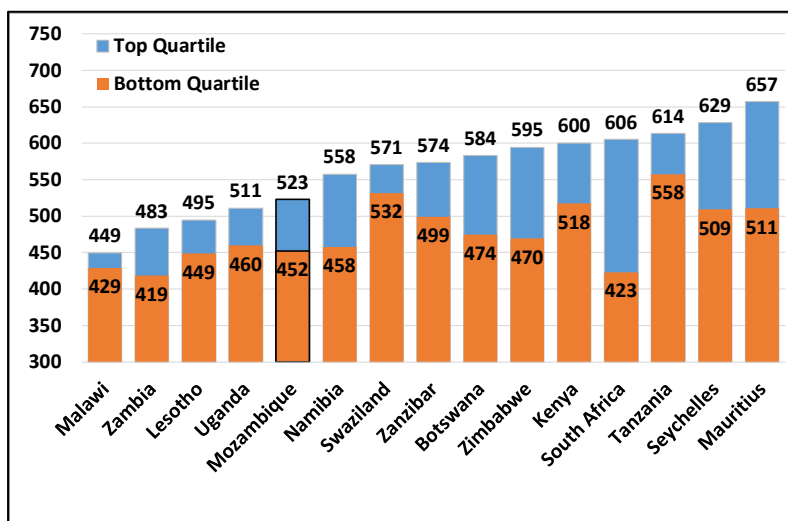
Such a deterioration in average performance on the standardized SACMEQ test is not unexpected, given the massive growth in enrolment. Either of two factors could have operated. The fact that enrolment expanded makes it likely that more pupils from disadvantaged socio-economic

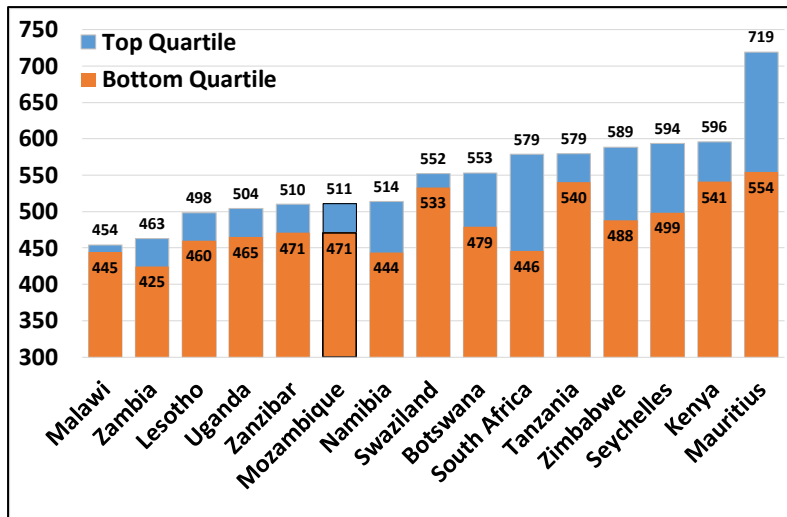
backgrounds entered school. On the other hand, pressure on school resources (infrastructure, textbooks, teachers) may have been the cause of the performance decline. New teachers appointed in response to massively increased expansion of enrolment are likely to be of lower quality on average.

It is also possible that the rapid expansion of enrolment may have encouraged more lenient promotion of pupils. Zhang (2006: 593) investigated Mozambican performance in SACMEQ II (2000) and found that grade repetition was a major feature of Mozambican education: more than two-thirds of sixth-graders in the sample had repeated a grade at least once. This reflected in ages of learners: the average age for sixth-graders in Mozambique was older than 14 years. Interestingly, there was no difference in the prevalence of grade repetition between urban and rural pupils. Fox et al. (2012: 24) found that grades 5, 7 and 8 had particularly high repetition rates, which are probably ascribable to external examinations in these grades, or because these are the end of school phases.

Nevertheless, the slope of the Mozambican social gradient (the relationship between socio-economic status and a social outcome, in this case the score on the test) is quite flat. Ross & Zuze (2004), using the 2003 SACMEQ data, found that the average slope within SACMEQ countries as a group was 0.41, i.e. for every one standard deviation increase in socio-economic status (SES), here measured by an asset index, the score increases on average by 41 points. In Mozambique, in contrast, the slope was 16, about the same as in Malawi and Lesotho (17), but far below most other SACMEQ countries, in particular South Africa with a slope of 70 and Mauritius with a slope of 89. A slightly different perspective conveying broadly the same message is that the SES of a student has a weak correlation with test scores in Mozambique, something again observed in 2007, again with variation between subjects: the correlation coefficient of SES and the Mathematics score is 0.12, while the correlation of SES with the Reading score is considerably higher at 0.25. A further way of looking at this is presented in the two panels of Figure 9, which show the scores of the bottom and top quartiles of performers in Reading and Mathematics respectively. As can be seen, performance in Mathematics in Mozambique is very weak even amongst the top quartile of performers, so there is little inequality in this subject: The score difference between the top and bottom quartile is only 40 points. In Reading, however, this difference is 71 points. Note though that in both subjects, inequality in this aspect of education does not seem to be nearly comparable to that in, for instance, South Africa or Mauritius.

Figure 9: Scores of the bottom quartile and the top quartile for each country in SACMEQ III in Reading (Panel A) and Mathematics (Panel B)





Source: Authors' Own calculations based on SACMEQ III

It is useful when investigating factors associated with test performance to employ education production functions, an approach that looks at the school as a production facility responsible for generating educational outputs. Inputs are the pupil, teacher and school characteristics related to educational outcomes. In this case, where two groups (SACMEQ III and SACMEQ II) performed differently, the Oaxaca-Blinder decomposition technique—often employed to study labour market outcomes by decomposing earnings across groups (e.g. gender, race) into a component explained by productive differences and an unexplained component normally attributed to discrimination—can be used to statistically ‘explain’ the lower pupil mean scores in 2007. This could help to isolate whether the decline in performance was ‘caused’ by the decline in the endowments of productive characteristics, or by the decline in how these characteristics are ‘remunerated’ over time.<sup>7</sup> Da Maia (2012) undertook a three-way decomposition of both Mathematics and Reading scores. The average fall in scores was 38.5 in Reading and 45.5 in Mathematics, corresponding to around 60 per cent and 80 per cent of Mozambican standard deviations. Table 11 shows his decomposition of these changes in Reading and Mathematics test scores into three parts:

- a part explained by differences in endowments of productive characteristics (the endowments effect), i.e. the expected change in SACMEQ II pupils’ mean test scores if they would have had SACMEQ III pupils’ endowments of ‘productive’ characteristics, where these characteristics are the predictors used in the education production function to ‘explain’ output or test score;
- a part reflecting differences in the returns to the productive characteristics (the coefficients effect), i.e., the expected change in SACMEQ II pupils’ test scores when applying the SACMEQ III pupils’ coefficients to the SACMEQ II pupils; and
- the joint impact of the differential in characteristics and differential in coefficients (the interaction effect).

In both decompositions the endowments effect was negative, indicating that on average SACMEQ II pupils had better endowments of productive characteristics than SACMEQ III pupils did. However, the small and statistically insignificant contribution of endowments suggests that factors other than endowments were responsible for the fall in scores. SACMEQ III pupils had smaller returns to their productive characteristics than SACMEQ II pupils, as is implied by the negative

<sup>7</sup> Though these terms are more appropriate for the labour literature, they will nevertheless be transferred to education research here.

and statistically significant coefficient effect in both decompositions (see Table 11). Thus, almost all of the fall in scores is statistically ‘explained’ by the coefficients effect. The interaction term in both the Reading and Mathematics decompositions is small and statistically insignificant.

Da Maia (2012) thus explains that, ‘for both Reading and Mathematics, the bulk of the overall fall in scores over time resulted from changes in the coefficients. This suggests that pupil productive characteristics became less efficient in converting those characteristics into cognitive achievement. The evidence points towards a deterioration in school efficiency between SACMEQ II and SACMEQ III.’

Table 11: Decomposition of Reading and Mathematics scores, SACMEQ II vs SACMEQ III

	Reading scores		Mathematics scores	
SACMEQ III (2007)	476.9***		484.1***	
SACMEQ II (2000)	515.4***		529.5***	
Difference	-38.5***		-45.5***	
	Scores	Proportion	Scores	Proportion
Endowments	-1.8	0.05	-0.5	0.01
Coefficients	-40.3***	1.04	-46.2***	1.00
Interaction	3.6	-0.09	1.2	-0.03
Observations	6,142		6,089	

Note: \* p<0.1, \*\*p<0.05, \*\*\*p<0.01

Source: Da Maia, 2012. (The table is reproduced here with permission from the University of Stellenbosch, copyright holder of the thesis.)

Da Maia (2012) undertook further decomposition within the different variables, but found that none of these factors played a large role in the changing performance. He found that the most important factor was a decline in the intercept and interpreted the negative, large, and statistically significant intercept effect as the advantage of SACMEQ II pupils over SACMEQ III pupils on aspects unrelated either to differentials in endowments of productive characteristics or to different returns to those productive characteristics.

What could such aspects be? Two possibilities come to mind:

- Drop-out rates were relatively high for the earlier cohort (SACMEQ II pupils). The drop-out rate for all grades in Mozambique was 72 per cent in 1999, but only 56 per cent in 2008. Assuming that pupils dropped out before the Reading and Mathematics tests were conducted, then the significantly greater proportion of early school leavers in SACMEQ II would probably have upwardly biased the SACMEQ II average results.
- Another plausible explanation for the results found here could be that standards have declined between the two surveys. The rapid expansion of the school system between the years 2000 and 2007, added to the fact that since 2004 teachers and schools institutionally had less discretion to hold back underperforming pupils, might have resulted in the promotion of a great proportion of low ability pupils. The greater proportion of weak pupils in SACMEQ III compared to SACMEQ II might have pulled down the average Reading and Mathematics test scores over time.

If neither changes in endowments of productive characteristics nor changes in their returns explain the average fall in pupils’ scores over time, the explanation for the fall in test scores has to be sought elsewhere, perhaps in the fact that there was greater drop-out and less easy promotion of weak learners that would have affected grade-6 pupils in 2000 than in 2007. Fox et al. (2012: 6) refer to the fact that Mozambique implemented ‘semiautomatic promotion’ from 2004/5, whereby ‘pupils receive automatic promotion within each grade block. Promotion between blocks is based on school exams.’



Despite the successes in expanding the coverage of the school network and the resulting improvement in access to education, there are indications that the average quality of education has deteriorated. However, Crouch and Gustafsson (2017: 22) state that the reduction in performance in Mozambique was indeed driven by the substantial expansion in access to primary schools that led to rapid growth at lower levels of performance, but they then add that ‘there was also growth in the number of pupils at middle and higher levels of performance. The latter phenomenon was largely missed as it was obscured by the decline in the mean.’ This is similar to the conclusion drawn by Spaul and Taylor (2015).

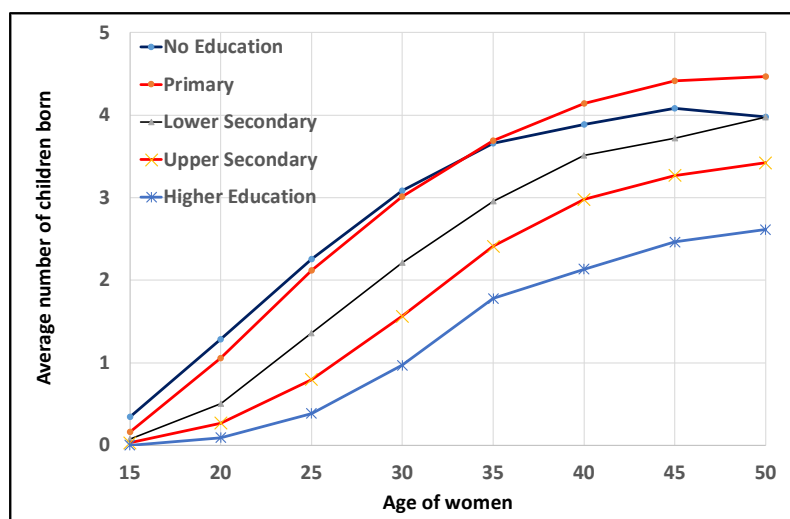
One should perhaps also add that it is difficult to compare socio-economic status over time in Mozambique over this particular period. Pupil SES, a measure of the socio-economic status of pupils’ household, is derived using Principal Component Analysis or Multiple Correspondence Analysis (MCA) applied to household ownership of assets to compute a latent variable that proxies for household wealth. Given strong economic growth averaging 8 per cent per annum in the period 2000–07, one would have expected SES to have improved, but at the same time enrolment expanded, drawing in more poor pupils. The SES wealth index might then not be a good indicator of the evolution of pupil socio-economic status over time. Other variables available in the SACMEQ data do give an indication that more children from poorer groups attended grade 6, such as the fact that 12 per cent of pupils in SACMEQ II had a mother without formal schooling, but by 2007 this figure had risen to 17 per cent of pupils. There was also a 10 percentage point increase in pupils living in households that used candles as source of lighting, whilst the proportion of pupils without any books at home increased substantially from 20 per cent to 31 per cent (Da Maia, 2012). An immediate consequence of rapid enrolment increases was that teacher numbers did not keep pace. Mozambique already had large classes in SACMEQ II (53 pupils per class on average), but this rose to 59 in 2007.

## **5 The benefits of education**

Education’s direct benefits for the recipients of such education is well known, in terms of increased probability of finding a job, and higher productivity and hence higher earnings once in a job. However, in very poor countries such as Mozambique, many people have no realistic chance of finding a wage job, whilst there is scant evidence that education brings about much greater productivity in subsistence agriculture. Thus it is not surprising that many rural parents are sceptical about the benefits of educating their children.

For society, however, the benefits are clearer. UNICEF has estimated in 2006 that ‘children with mothers with no formal education are more likely to experience severe nutrition deprivation and are 130 times more likely to die before the age of five’. (Roby et al., 2009:44). Another indirect benefit of education is that there is substantial evidence that higher levels of female education in developing country contexts lead to fewer children, and often also to a delay in marriage and postponement of first birth. These are important factors in the empowerment of women, but also in reducing resource pressure in households and in society. A simple graph showing the bivariate relationship between age of women and the average number of children they have borne, for different levels of mother’s education, illustrates this (Figure 10).

Figure 10: Age and number of births for different levels of mother's education



Source: Authors' illustration derived from data in DHS2011

## 6 Conclusion

It would not be unfair to describe the situation in Mozambique today as Heltberg et al. (2001: 27) did more than 1½ decades ago, that '...inequalities in school education and attainment accumulate up through the educational ladder, resulting in increasingly unequal distribution.' Central to this is the poor quality of education in rural areas, particularly in the Northern and Central regions. In addition, there are still large backlogs in female education, although these have now been eliminated for new school cohorts. These nevertheless continue to have an important influence on the opportunities for women in the labour market, and on their status in society. This applies even more in rural areas than in urban areas.

Considering how limited education still is in Mozambique, this paper has focused on school education. In higher education too there is great inequality, which naturally flows from the extremely small numbers in grades 11 and 12, thus 'Higher education continues to reach only a tiny, disproportionately male sector of the wealthier population, with facilities clustered in the few major urban areas.' (Classbase 2017).

The gender dimensions of inequality in education have lasting effects, and keep on excluding women from some of the more attractive jobs, including teaching. Thus a decade ago 81 per cent of teachers in rural areas were male, a much higher proportion than the 57 per cent in urban areas (Bilale 2007: 17). This is unlikely to have changed.

It is therefore safe to conclude that the weak quality and unequal distribution of education continue to exclude a large part of the population from full participation in society. For a modern economy to grow and flourish, this matter needs to be addressed.

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