



**Consortium for Research on  
Educational Access,  
Transitions and Equity**

**Participation and Performance in Education  
in Sub-Saharan Africa with special reference to Kenya:  
Improving Policy and Practice**

**K. M. Lewin  
P. Wasanga  
E. Wanderi  
A. Somerset**

**CREATE PATHWAYS TO ACCESS  
Research Monograph No. 74**

**November 2011**



**University of Sussex  
Centre for International Education**



Consortium for Research on  
Educational Access, Transitions & Equity

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The Consortium for Educational Access, Transitions and Equity (CREATE) is a Research Programme Consortium supported by the UK Department for International Development (DFID). Its purpose is to undertake research designed to improve access to basic education in developing countries. It seeks to achieve this through generating new knowledge and encouraging its application through effective communication and dissemination to national and international development agencies, national governments, education and development professionals, non-government organisations and other interested stakeholders.

Access to basic education lies at the heart of development. Lack of educational access, and securely acquired knowledge and skill, is both a part of the definition of poverty, and a means for its diminution. Sustained access to meaningful learning that has value is critical to long term improvements in productivity, the reduction of inter-generational cycles of poverty, demographic transition, preventive health care, the empowerment of women, and reductions in inequality.

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## Preface

This paper addresses important issues that arise from analysis undertaken by CREATE of changing patterns of access to education and their correlates. It is based on research commissioned by CREATE to explore changing patterns of access and explore relationships between performance, age, gender and location. The draft findings were first presented in plenary at the annual meeting of the Association for Educational Assessment in Africa in Nairobi in August, 2011 to about 350 delegates.

It is clear that the story of Education for All since Jomtien has taken many different forms in different countries. Data on participation across eight sub Saharan African countries is used to explore how participation has changed. Some have made fairly steady progress in increasing access and participation, others have seen rapid gains followed by periods of stagnation, and others have failed to make much progress. Analysis of enrolments by year and grade shows the realities that have superseded the promises to universalise access. This is important to appreciate because future progress depends on a robust and accurate understating of how things *are*, not how they *ought* to be after 20 years of EFA. Planning must see inside the box of aggregated statistics on participation that conceal how high enrolment rates across a whole schooling cycle may hide very low completion rates. They may also make invisible the transient effects of policy initiatives that fail to sustain gains in participation over time.

The analysis by gender illustrates how much has been achieved in relation to gender parity, and that there is still a road to travel. It is clear from this analysis and comparison with participation rates and household income that poverty is usually far more important than gender as a predictor of educational exclusion. And in most cases it is also more important than location and rurality.

Age-in-grade varies widely across grades and all low enrolment countries appear to have a wide dispersion of age-in-grade. No high enrolment country has wide age-in-grade variation. This is critical to learning, especially where curricula are mono-grade not multi-grade. Progression at an appropriate age is essential for successful learning linked to learning tasks matched to capabilities.

The second part of this monograph explores participation and performance in the primary school leaving examination in one country – Kenya – in relation to age, location, and gender, in order to probe in more depth aspects of the relationships between these variables. The findings are compelling and reinforce the messages from the cross national data. Age is strongly correlated with performance, differences between boys and girls have been diminishing, and location does relate to performance but in complex ways.

The analysis leads to policy recommendations which could lead to improved performance, greater equity and less wastage in school systems in Sub Saharan Africa.

## Summary

This paper explores aspects of exclusion from education and how patterns of participation have been changing using national data sets. The first part of the analysis uses administrative data from countries in Sub Saharan Africa to chart enrolments by grade over the last decade and explore how enrolment has been changing in terms of grade, gender, and age. After establishing key issues that are raised by the data across eight countries the paper develops a detailed case study of changes in participation and performance in Kenya using data from the Kenya National Examinations Council. The study shows that the aspirations of Education for All remain far from being met in many countries and many of those who enrol in Grade 1 fail to complete primary or lower secondary school. Progress has been patchy and it remains the case that over enrolment in the lower Grades is common (with more enrolled than there are children in the relevant age group as a result of over-aged entry and progression), and less than half the age group progressing through lower secondary school. Gender equity in enrolments is being approached in the eight countries included in the analysis but patterns differ and are contextually located. In all the countries many of those enrolled remain seriously over-age, and urban rural differences persist in enrolment status. The detailed case study of data from Kenya complements the cross national analysis. It shows how uneven growth in participation has been after the announcement of free primary education, and how strongly patterns vary by county. Strikingly it confirms that older children score on average much lower on the Kenya Certificate of Primary Education (KCPE) than younger children, and that this is likely to exclude older candidates from the best secondary schools. This is a source of considerable inequity since over-age status is associated with poverty.

# **Participation and Performance in Education in Sub-Saharan Africa with special reference to Kenya: Improving Policy and Practice**

## **1. Introduction**

Since the World Conference on Education for All at Jomtien in 1990 and its commitments to universalise access to primary education enrolments in schools in Sub-Saharan Africa have grown greatly. Encouragingly, enrolment rates in primary schools have improved and the estimated numbers of children out of school in sub-Saharan Africa (SSA) has fallen from about 42-million in 1999 to about 29-million in 2009. Gross enrolment rates across SSA now average 102%. Net enrolment rates, which exclude the over-age, are less, averaging about 76% suggesting that only about three-quarters of primary school age children in SSA are enrolled (GMR 2010).

Girls are participating much more than in the past and the Gender<sup>1</sup> Parity Index averages about 0.95 indicating that gender parity in enrolments is not far from being achieved in many countries. But some countries are making slow progress and there are still some places where boys in school outnumber girls by 20%. Having more boys than girls in school is strongly associated with low overall enrolment rates, high rates of repetition, many over-age children in school. and greater persistence of boys rather than girls at older ages. Most middle and higher enrolment countries have more girls than boys enrolled, especially in higher grades.

At secondary school level the magnitude of exclusion is much greater than at primary. In many of the poorest countries more than half of all children fail to enrol at secondary level. Of these who do fewer than half will complete a full cycle of secondary schooling and qualify for any further education and training. Those who succeed will be overwhelmingly from richer rather than poorer households. The chances of the poorest 20% completing secondary school can be as little as a tenth that of the richest. And if there are gender gaps in participation in primary schooling, they are almost always larger at secondary level.

In reality there are far more than 60 million primary age children whose right to basic education is denied. Many fail to attend regularly, are seriously over-age for the grades they attend, and alarming numbers do not achieve basic skills after 6 years or more of schooling. If these “silently excluded” children are counted then the numbers without meaningful access to primary schooling are well over 250 million. And, if the basic education cycle includes lower secondary, then this number is itself a substantial underestimate of the children whose right to education is compromised.

This paper<sup>2</sup> explores some particular aspects of exclusion and its recent evolution using national data sets, and illustrates some of the key issues of age, gender, location and performance with reference to recent work in Kenya with the National Examination Council. The next section presents data on enrolments by grade over time in eight countries. This is used to illustrate how much the flow of students through these systems has, and has not, changed since 1990 and comment on some of the possible reasons. In most of the countries the effects of selection examinations are visible at transition points to lower and upper secondary. This leads to consideration of patterns of participation by gender, by age-in-grade, and by location in the same countries. The work of the Consortium for Research on Educational Access, Transitions and Equity (CREATE) has

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<sup>1</sup> The Gender Parity Index compares Gross Enrolment Rates for girls with those for boys.

<sup>2</sup> The analyses in this paper were developed within the general research framework provided by the Consortium for Research on Educational Access, Transitions and Equity (CREATE). The first section is based on analysis by Keith Lewin and of administrative data from Ministries of Education across several countries in Sub-Saharan Africa. The analysis of Kenya Certificate of Primary Education data was undertaken by Paul Wansanga, Ephraim Wanderi and Tony Somerset with support from the Kenya National Examination Council.

highlighted how many children are seriously over-age in many Sub Saharan education systems with powerful consequences for their chances of completing primary and secondary school. It is not uncommon for as many as 30% of children in primary school to be over-age by three or more years in our Anglophone sample. Francophone countries have fewer over-age children in their systems but often have fewer enrolled. Those who are most over-age are more likely to have dropped out (Lewin and Sabates, 2011). It is probable that being over-age disproportionately disadvantages girls. None of the eight education systems have pedagogy and curricula designed to recognise wide age-in-grade variance with the probable consequence that learning is adversely affected. From household survey data across thirteen countries it is clear that children who do not progress to the end of primary school and transit to secondary are overwhelmingly poorer and more likely to be over-age than those who progress through the system.

The third section develops a case study of performance in the Kenya Certificate of Primary Education (KCPE) which is taken in grade 8 and determines transition into different types of secondary school. It has been possible to track in detail how the age, gender and location of candidates has changed over the last two decades. It is also possible to establish the strength of the correlation between age-in-grade 8 and performance in the selection examination. The final discussion collects together and summarises insights from the case study in Kenya and from the cross national data sets and distils policy relevant conclusions.

There are few if any good reasons why children should be over-age. All high-enrolment countries with high primary school completion rates have small proportions of over-age children enrolled. If being over-age is strongly associated with much greater risk of drop out, low achievement, and a low probability of progressing to secondary school then it is something that must be addressed much more actively than it has been to date. It is a matter for concern that in several countries the numbers over-age have increased rather than decreased as participation rates have improved. This would seem to guarantee that universal access will remain a goal rather than an achievement, especially since over-age children are disproportionately from disadvantaged groups and because being over-age almost certainly reinforces other likely causes of exclusion from education. Reducing the numbers over-age should improve completion rates and could reduce differences in outcomes associated with poverty.

## **2. Changing Patterns of Participation in Education**

Research on changing patterns of access has analysed large scale cross national data sets to understand the evolution of participation, why universalising access has proved so elusive, and what lessons can be learned from the last thirty years (Lewin, 2011; 2009; Lewin and Sabates, 2011; Oketch and Somerset, 2011; Somerset, 2007; Little 2008; Rolleston, 2009; Chimombo, 2009; Akyeampong, 2009). This section explores data from eight countries - Uganda, Malawi, Kenya, Ethiopia, Tanzania, Ghana, Zambia, and South Africa - to deepen understandings of access to education.

Recent research using national samples from thirteen sub-Saharan African countries from the 1990s and 2000s allows comparisons of enrolments over time (Lewin and Sabates 2011). This analysis shows that though overall participation has increased, the chances of the children from the poorest households enrolling and progressing through school relative to the richest households have generally not improved substantially. In some case they have deteriorated. Poorer children are more likely to be over-age and unlikely to complete schooling especially if they are girls. Girls are more likely to be out of school than boys in most of the Francophone countries but not in most of the Anglophone countries. Rural children remain more likely to be over-age (Lewin and Sabates, 2011). Reductions in the number of children out of school have occurred but this has often been accompanied by an increase in the proportion of children over-age for the grade in which they are enrolled. This was not anticipated and is almost certainly deleterious to efforts to universalize access through to successful completion of the basic education cycle.

### **2.1 Changing Enrolments**

The changing patterns of enrolment over time in African countries are illustrative of the problems that have hampered attempts to universalise access to basic education, generally taken to consist of eight or nine years of schooling to the end of lower secondary school. Using administrative data from school censuses allows time series of enrolments by grade to be plotted. Figure 1 shows the results for eight African countries indicating how enrolments in each Grade over the basic education cycle have changed in different years. Children in a particular grade would normally be expected to be promoted to the next grade the following year. A high-enrolment low-attrition system would therefore show enrolment lines that were parallel and close together. This is only true in South Africa. It is clear that the evolution of participation has been very different in different countries.

In Uganda Universal Primary Education (UPE) was announced in 1997 and enrolments in Grade 1 more than doubled. However, these Grade 1 children did not arrive in Grade 7 seven years later as the cohort track on the chart shows. The system reached a new equilibrium with high drop out and many over-age children. The numbers reaching Grade 7 in 2007 were only about half the number in an age cohort. In the last two years there appears to have been an acceleration of enrolment growth in Grades 6 and 7 as a result of new efforts to meet enrolment targets in advance of 2015. Completion rates remain well below those necessary for EFA to be achieved. Indeed the data shows that there was much “queuing” in Grade 6 as schools kept back children likely to fail the Grade 7 primary school leaving certificate (Lewin, 2007b).

In Malawi a similar patterns is evident with over enrolment in Grade 1 persisting year after year. The proportion of students graduating from Grade 8 has remained fairly similar despite a dramatic increase in total enrolments, and remains about a quarter of those enrolled in Grade 1. Attrition remains alarmingly high (Chimombo, 2009) and there is no sign it is diminishing.

Kenya also has a similar if less extreme pattern of enrolment growth. The most recent announcements of free primary schooling have generated peaks in enrolments in Grade 1 which are not fully translated into peaks in subsequent Grades indicating that not all progress. Grade 8 has at least 20% fewer enrolled than Grade 7 indicating as in Uganda that queuing is taking place in Grade 7 as schools hold back those unlikely to do well in the primary leaving certificate.

In Ethiopia over a ten year period there has been a considerable improvement in the numbers entering Grade 1. A peak in mid decade was followed by a trough that itself was followed by another peak in 2008 reflecting national initiatives. These gains have yet to reach the higher grades but it does appear that more will complete the primary cycle than in the past and that real gains are being made in participation.

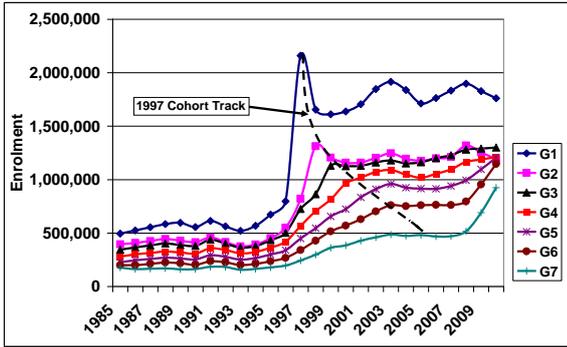
Tanzania has had two attempts at UPE and this is clearly visible in the chart. The last attempt appears more successful than the first when large enrolment gains were followed by a steep fall off in participation in the 1980s (Lewin, 2009, Sabates, et al., 2011b). In Tanzania there were clearly two waves of enrolment growth linked to attempts to universalise primary education. The progress made in the late 1970s after the Arusha declaration stalled in the 1980s. It was revitalised by the 2002 initiative to make primary school free and available to all. Rapidly increasing enrolments in Grade 1 have been reflected in greater enrolments in higher Grades and in a narrowing of the gap between enrolments in Grade 1 and Grade 7.

In Ghana Free Compulsory Basic Education (FCUBE) led to enrolment growth with only a small step upwards in the late 1980s. The gap in enrolments between Grade 1 and Grade 6 has remained fairly constant over 20 years, suggesting drop out and completion rates failed to improve. Fee free schooling linked to capitation payments to schools had an impact on enrolments in 2005. This appears to be a one off gain in total enrolments which is being sustained. However it does not appear to have had much effect on attrition (Akyeampong, 2011). In Zambia enrolment growth in Grade 1 has stabilised since 2007 after a period of growth linked to the most recent announcements on free primary schooling. Grade 7 enrolments remain about 60% of those in Grade 1.

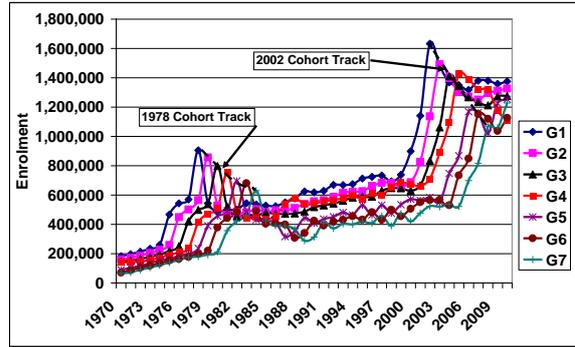
South Africa has a different pattern. Since 2000 it has had high levels of enrolment through to Grade 9. The great majority of those who enter the system progress through to the end of the general education phase. Grade 9 enrolments have been converging with those in Grade 1 in a pattern typical of high enrolment countries. There is however evidence that although the enrolment rates are high they continue to include substantial numbers of over-age children.

**Figure 1: Enrolments by Year and Grade; Sub Saharan Africa**

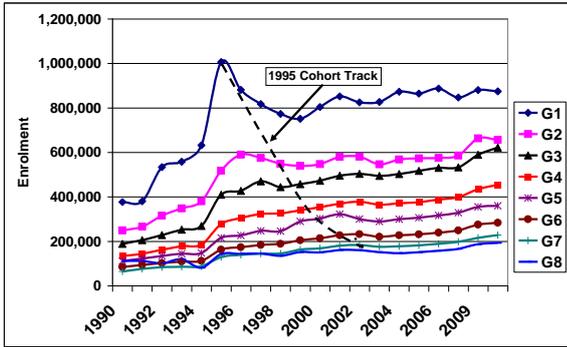
**Uganda**



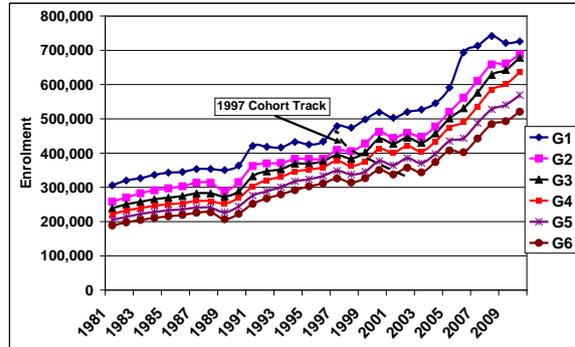
**Tanzania**



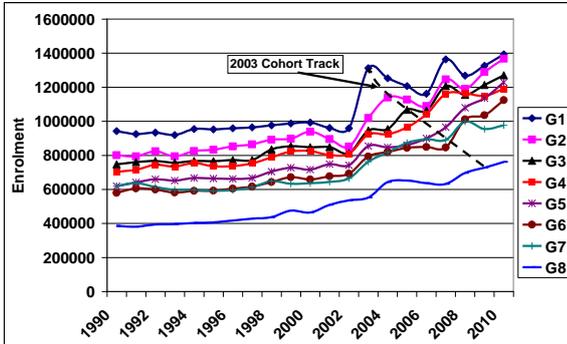
**Malawi**



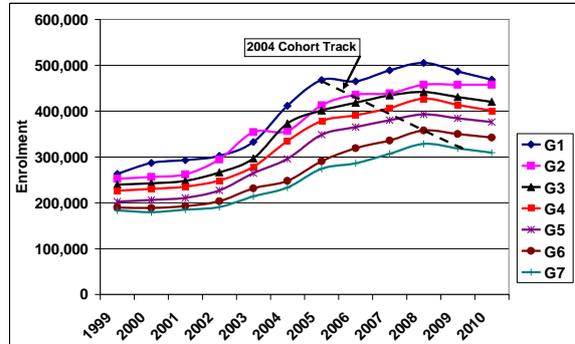
**Ghana**



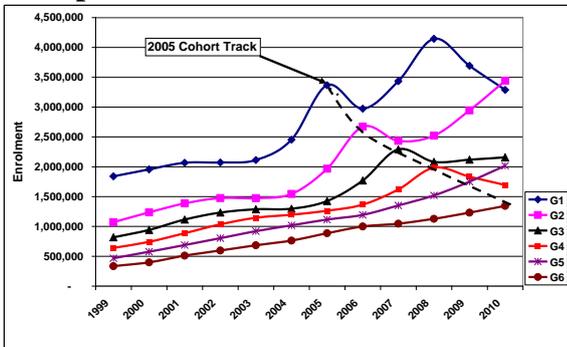
**Kenya**



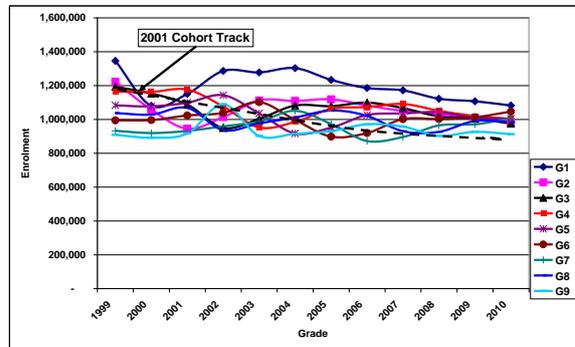
**Zambia**



**Ethiopia**



**South Africa**



## **2.2 Changing Patterns of Attrition**

A different way of presenting the same data provides more insight. Figure 2 shows the same eight countries but this time showing all grades up to Grade 12 over the last ten years only. In addition a line is drawn on each chart which indicates the size of the age group in 2010 for each grade. As a rough proxy if there was full enrolment and no drop out then the enrolment lines would follow the child population line with about the same gradient.

It is very clear from these charts that in all the countries except South Africa there are more children enrolled in Grade 1 than there are in the population of children by age in 2010. The tip over points (where the number enrolled becomes less than those in the relevant child population) vary from Grade 3 (Ethiopia), Grade 5 (Uganda, Malawi, Ghana), Grade 7 (Tanzania and Zambia), and Grade 10 in South Africa. It is important to note that the difference between those enrolled and those in the age group is a proxy for the proportion of children benefiting from a basic education at each grade level. Because those enrolled include those repeating this sets an upper limit to the likely participation rate at any grade level. From these profiles it is very clear that drop out remains a serious problem despite the fact that all these countries have Gross Enrolment Rates over 100%.

Examination of the charts draws attention to other features. In Uganda the bulges in enrolments in 2008/9 and 10 in the later primary Grades are indicative of new efforts to reduce drop out and increase completions rates. Despite moves towards tuition free secondary schooling participation remains well below the nominal numbers in each age group at all secondary level grades.

In Malawi it is clear that drop out has remained very high with those in Grade 8 representing only about half of the number of 14 year olds. Very small numbers enrol at secondary level in Grade 9 and above. There is further drop out after Grade 10 at the transition to upper secondary. In Kenya enrolments remain high through to Grade 7 and then fall steeply to Grade 8 as a result of queuing – children are held back from Grade 8 if they are likely to fail the KCPE. The numbers in Grade 9, the first year of secondary are only about 50% of those in Grade 8, and are about 50% of the size of the age group. Since many are over-age less than half of Kenyan children are likely to be entering secondary school.

In Ethiopia attrition appears very high in the first three years. It is likely that this fall in enrolments over estimates drop out since many in the first three grades are over-age and may be repeating and some may be under age. Above Grade 3 fewer are enrolled than there are children in the nominal age group.

In Tanzania it is clear from the administrative data that since 2002 those who have entered Grade 1 have largely remained enrolled. The shape of the enrolment curve has been transformed and a much higher level of equilibrium has been established. This appears to track the nominal number of children in the age range. The effects of abolishing fees at secondary level in government schools are evident in increased enrolments in Grade 8 and above. These remain far from universal levels but may approach those in neighbouring Kenya if current trends are maintained.

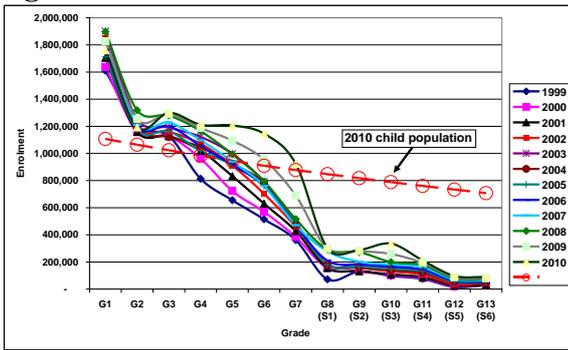
In Ghana there has been an increase in enrolments through to Grade 9 every year for the last decade. There has been little change in the rate of drop out between grades. The gains in enrolment in Grade 1 in 2005 reflect the introduction of a capitation system that was coupled with tuition fee abolition. Since then other factors have encouraged growth to continue. Transition to Senior Secondary School (SSS) remains available to a minority who are less than a third of the age group. Zambia has made considerable progress in increasing the entry to Grade 1. As in Ghana the rate of

attrition has not fallen and may have increased. Grades 8 and 9 have been incorporated into the first cycle of the basic school system and this is reflected in increased enrolments.

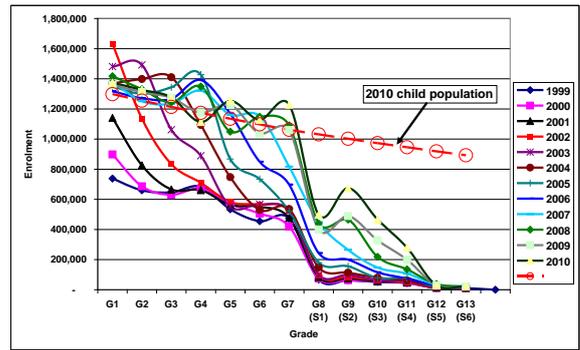
In South Africa the numbers enrolled in Grade 1 are similar to those in Grade 9. They are also comparable to the number in the nominal age group for each grade. There are different estimates of how many of those enrolled are over-age, and how many are out of school. It seems probable that 3% - 5% remain unenrolled and between 10% and 20% are over-age-in-grades 1 to 9.

**Figure 2: Enrolments by Grade and Year in Sub Saharan Africa**

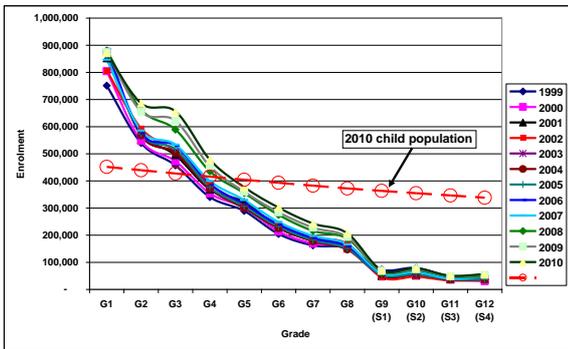
**Uganda**



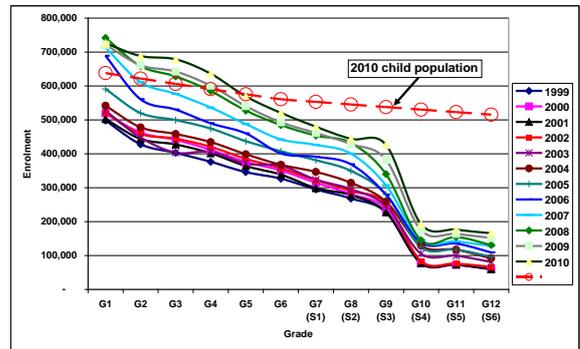
**Tanzania**



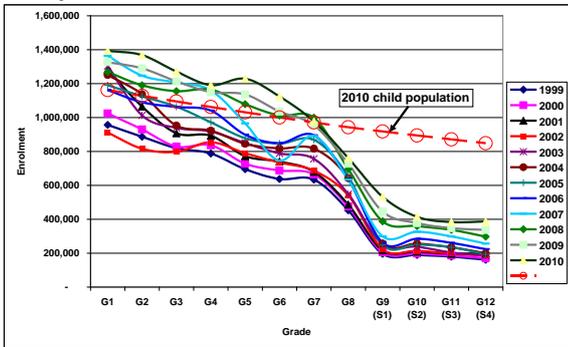
**Malawi**



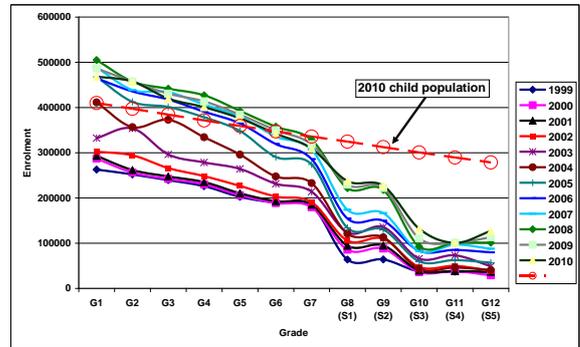
**Ghana**



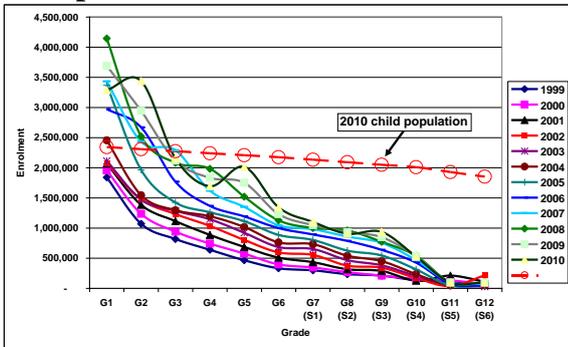
**Kenya**



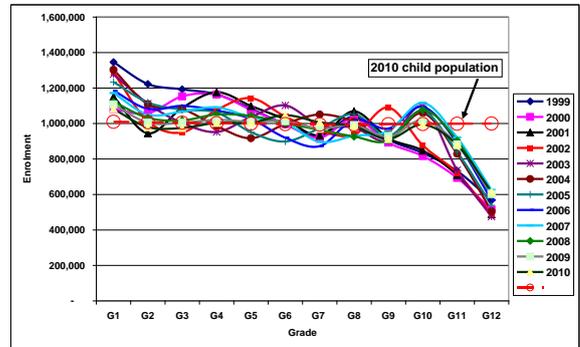
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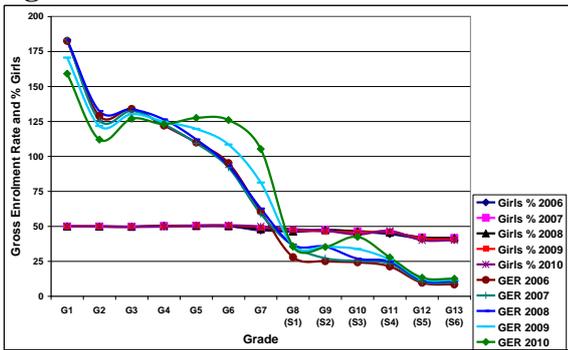
### **2.3 Patterns of Enrolment by Gender**

The third set of charts (Figure 3) provide insights into enrolments by gender and allow comparisons of the ratio of boys to girls with Gross Enrolment Rates by grade. The general point to note is that in all cases except South Africa the percentage of girls enrolled falls as the grade level increases. However, in these countries differences in enrolments between girls and boys are relatively small below Grade 6, and in most cases girls are more than 45% of total enrolments up to Grade 9. This means that well over 90% of girls and boys have the same enrolment status which for the majority is being enrolled. Only in Ethiopia does the pattern show girls being less than 45% of total enrolments at higher grade levels. In South Africa, as is the case in other Southern African countries not included in this analysis, there are more girls than boys enrolled, especially at the higher grade levels.

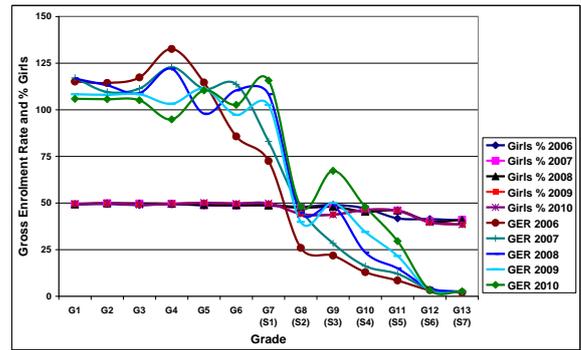
By contrast to these small differences by grade by gender, it is clear that Gross Enrolment Rates in all the countries fall rapidly by grade. Each country has its own distinct pattern. The largest differences in the proportion of girls enrolled tend to be where GERs are lowest, as in Ethiopia. Other data from household surveys (Lewin and Sabates, 2011) make it very clear that poverty is the strongest correlate of exclusion from higher grades.

**Figure 3: Gross Enrolment Rates and % Girls by Grade and Year in Sub Saharan Africa**

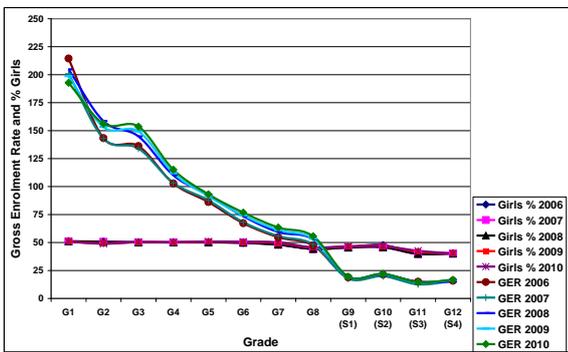
**Uganda**



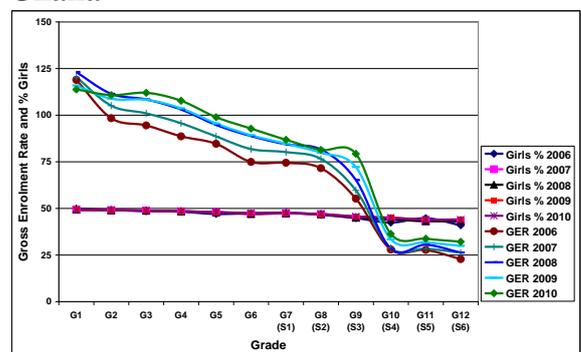
**Tanzania**



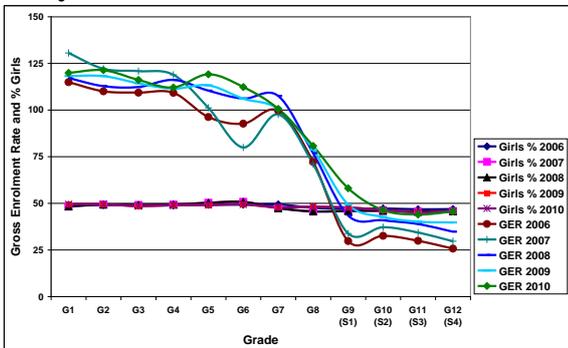
**Malawi**



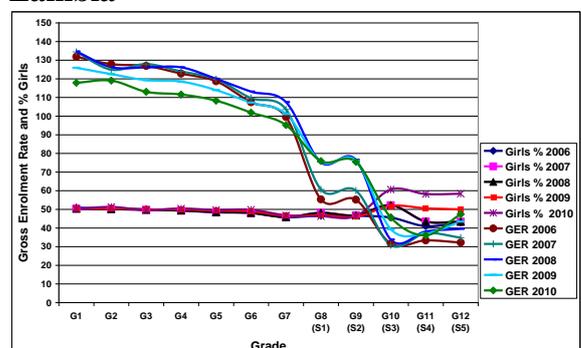
**Ghana**



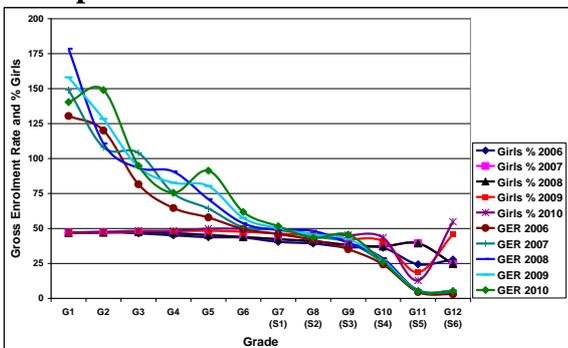
**Kenya**



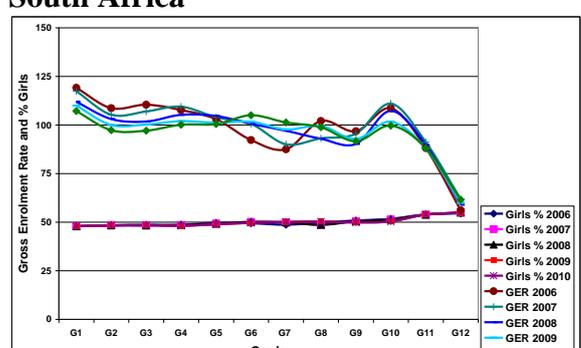
**Zambia**



**Ethiopia**

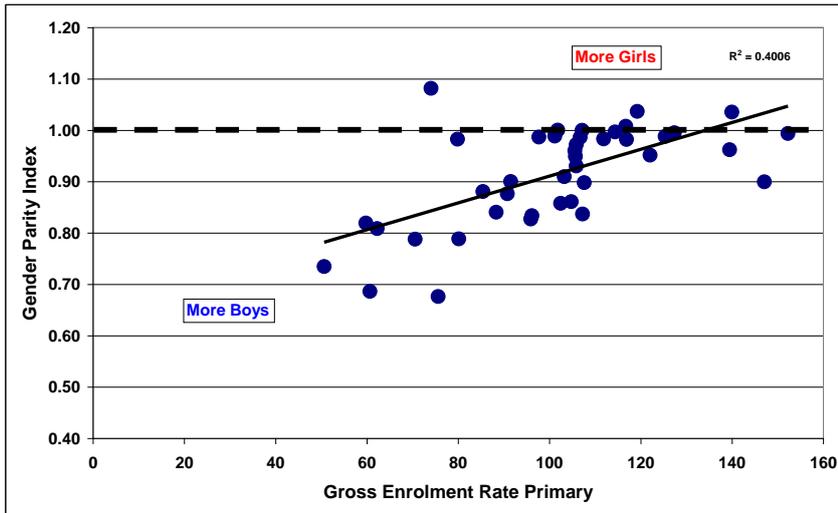


**South Africa**

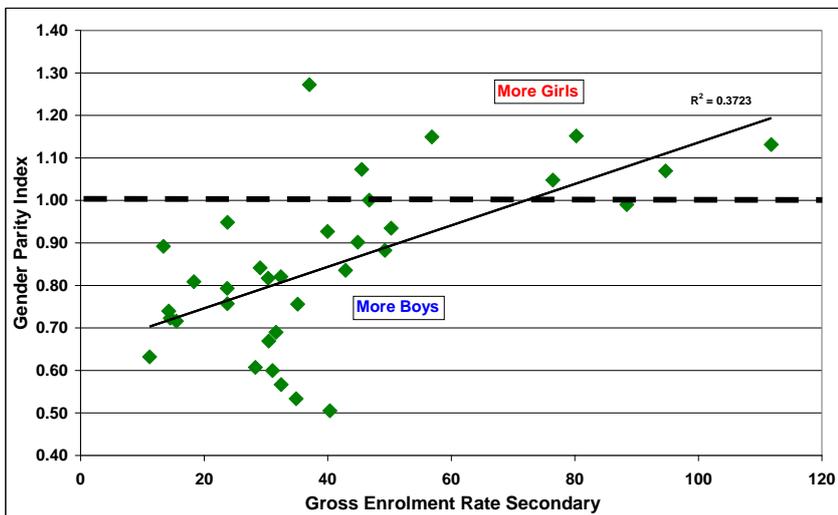


Analysis of data across 44 countries in Sub Saharan Africa confirms the tendency for gender differences in enrolment to be linked to overall enrolment rates (Lewin (2007)). Figures 4 and 5 show that at both primary and secondary level in Sub Saharan Africa the Gender Parity Index is correlated with GERs in ways that indicate higher GERs are more likely to result in less difference in enrolment between boys and girls. This may suggest that interventions to support girl's education must encourage increases in overall enrolment rates, especially at higher grade levels. Those countries with the greatest disparities in favour of boys in enrolments are all low enrolment rate countries.

**Figure 4: Gender Parity Index by Gross Enrolment Rate Primary in Sub Saharan Africa**



**Figure 5: Gender Parity Index by Gross Enrolment Rate Secondary in Sub Saharan Africa**



## **2.4 Over-age Progression**

In Sub Saharan Africa many children are over-age for the grades they attend. In some poor areas more than half of children are over-age by two years or more. In rural Africa it is common to assess school readiness by the size of a child especially where birthdates are unknown. In some of our household samples many children are stunted, almost guaranteeing late enrolment. Repetition of grades is endemic in systems which have low completion rates. This exacerbates the numbers of children over-age. Girls are especially disadvantaged by being over-age. No high completion system has a wide range of age-in-grade.

Conventional measures of patterns of access conceal the way age-in-grade varies (Lewin, 2011d). The evolution of age-in-grade relationships is important for several reasons. First, children who enrol above the normal age of entry will miss learning experiences at a time when they are most receptive to learning basic skills and establishing secure foundations for cognitive development.

Second, those who repeat Grade 1 or subsequent grades will become over-age for their grade. The more over-age a child is within a grade the more it is likely that they will underachieve (Taylor et al, 2010).

Third, where older children are taught in class groups with younger children there may be psycho-social issues (e.g. of self esteem, bullying, genderual harassment) and problems of matching learning to cognitive capabilities (especially with monograde curricula where all pupils are taught the same things at the same time).

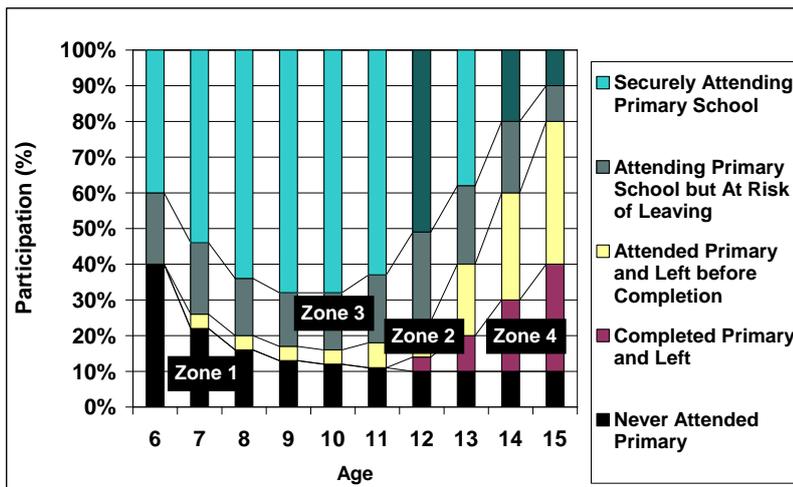
Fourth, over-age children will be late to arrive at the last grade of primary or junior secondary school. Where the age of initial entry is six or seven, primary school leavers in a six grade system will be 12 or 13. If they are two years over-age, they will be 14 or 15. This approaches the ages of entry to the labour market and of marriage. It is unlikely most will continue further.

Figure 6 shows how participation can change with age and is linked to the CREATE zones of exclusion. It indicates that in this system, which is based on data from Ghana, about 40% of six year olds are not in school. This falls to about 10% by age 11. Above this age those who have not enrolled are unlikely to ever enrol (zone 1).

From age 7 and above some children drop out and the number gradually increases with age. These become the largest number of out of school children above 11 years old and fall into zone 2 of the CREATE model. Children who enrol but are at risk of drop out and are characterised as low attending, over-age, repeating years and poor achieving fall into zone 3 and gradually become an increasing proportion of those still enrolled in primary grades.

From 12 years and above some make the transition into secondary school though if they fail to do this by the age of 15 or so it becomes increasingly unlikely that they will complete lower secondary successfully.

**Figure 6: Age and Zones of Exclusion**



Data on age-in-grade illustrates common patterns. Figure 7 shows this. In Uganda over enrolment in Grade 1 includes children between the ages of 5 and 10 years. Enrolments from Grade 2 to 7 are substantially less and include increasing age dispersion. By Grade 7 the age range is between 12 and 20 years. Similarly Malawi has a pattern of over-age enrolment where the spread of ages within a grade increases greatly from Grade 1 to Grade 8. There is even more attrition than in Uganda with only a small minority surviving to Grade 8. Some children in Grade 8 are likely to be over 18 years old and would thus not complete junior secondary until they were well over 20 years old.

In Kenya age on entry may be as much as 10 or 11 years. By Grade 8 children are between 12 and 20 years old making it unlikely that the older children will progress to secondary school, especially if they are girls. The dispersion of ages increases with Grade making it likely that wide mixed age teaching groups will present a challenge to orthodox monograde pedagogies. Ghana and Zambia have similar profiles to Uganda, Malawi and Kenya with differences in detail. In these countries there is a sequential reduction in enrolments by grade coupled with widening age-in-grade spread from about five years in Grade 1 to eight years in Grade 6 or 7.

Botswana<sup>3</sup> presents a contrasting picture. Here most children are in the appropriate grade for their age in lower grades. There is some increase in the range of ages but much less than in most of the other countries. Tanzania is more like Botswana than most of the other countries. Here the data indicates that most children are within two years of the correct age for their grade. This is a striking change from the 1990s when the distribution of age-in-grade in Tanzania resembled other East African countries. South Africa resembles Botswana in its distribution of age by grade. For higher grades there are clearly pedagogic issues since there are children in the same grade with a six or seven year age difference. The oldest will be over 20 years before completing matriculation and the twelfth grade. It is more likely they will drop out not much beyond grade 9.

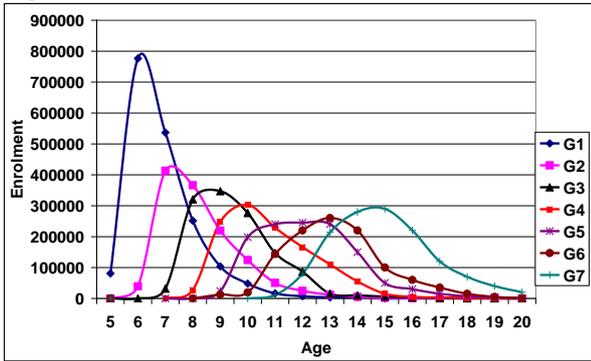
There are many variations on these patterns across countries. In most cases the dispersion in age within a grade increases with the grade level though primary school. Access to secondary schooling is selective. Often the process tends to select out those who are over-age completing primary school since those who are older often have poorer performance. It can therefore be the case that age-in-grade dispersion is less at secondary level (Lewin and Sabates, 2011). If the age-in-grade range remains wide it is inevitable that most will not complete primary and junior secondary. All countries or regions which succeed in universalising enrolment and completion of primary and

<sup>3</sup> Botswana has been substituted for Ethiopia in these charts since data is unavailable on the latter.

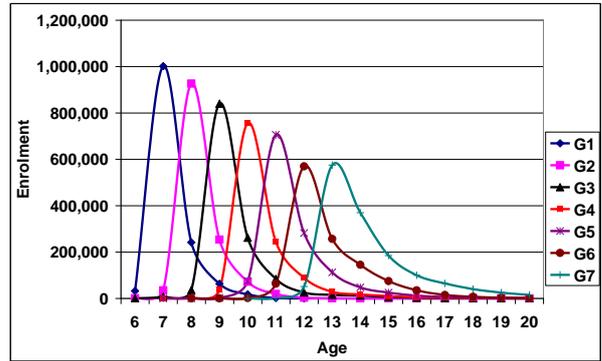
junior secondary have low dispersions of age-in-grade. Ensuring enrolment and progression on schedule is a low cost lever on participation that offers large gains at modest costs.

**Figure 7: Age-in-grade Distributions**

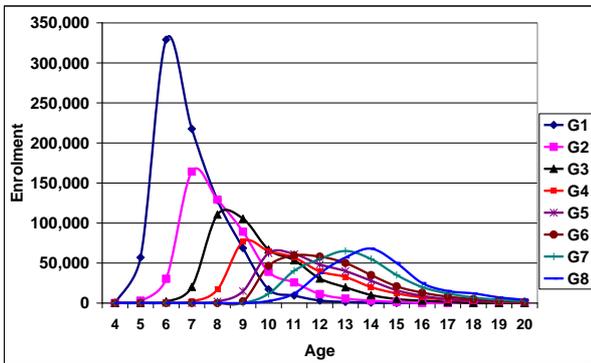
**Uganda**



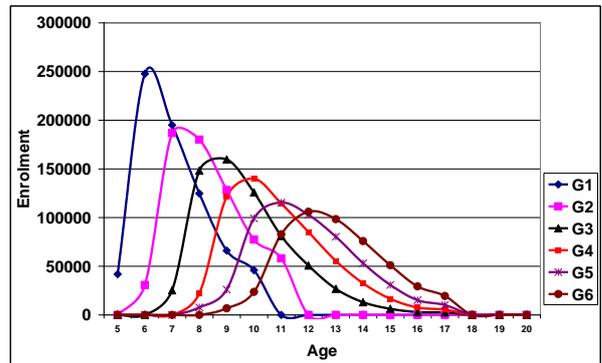
**Tanzania**



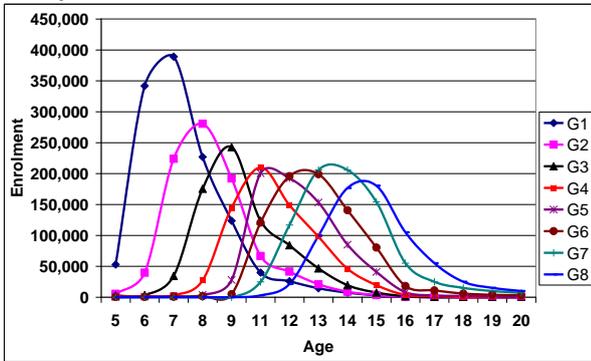
**Malawi**



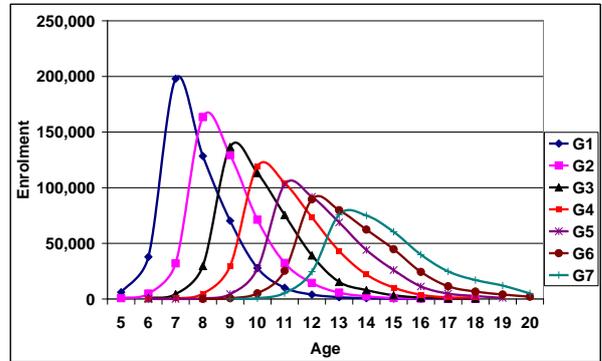
**Ghana**



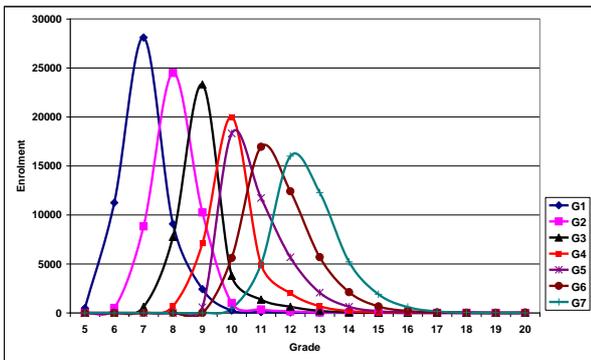
**Kenya**



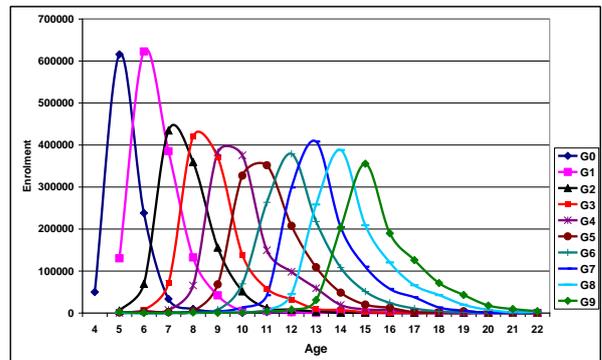
**Zambia**



**Botswana**



**South Africa**



## **2.5 Urban and Rural Attainment**

Using Demographic and household survey data it is possible to gain some insight into how patterns of educational attainment have been changing over time. By exploring the highest level of education reached by different age groups a picture of participation over the last thirty years can be established. Figure 8 show this for a range of different countries. It should be noted that the patterns for the youngest age group underestimate participation since it is probable that some in the age group will attain more years of schooling before completing or dropping out.

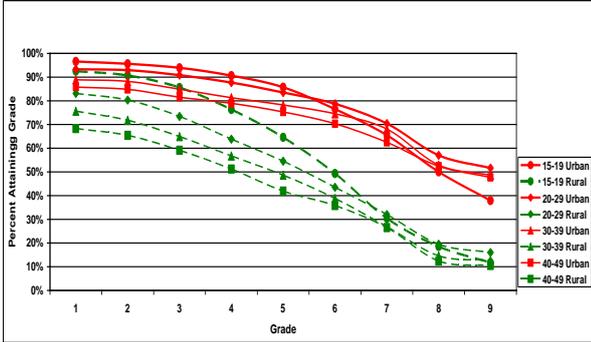
All the countries show that there is a strong effect of urban residence on participation. Urban children are more likely to complete the lower grades and much more likely to reach the secondary grades. This effect appears very marked in Uganda, Malawi, Ethiopia, Ghana and Mozambique. In Kenya the effect is small in the lower grades and gradually increases. In Tanzania the urban rural gap has narrowed considerably and is not strongly related to grade.

In Zambia and Tanzania the effects of selection to secondary schools are evident with large reductions in participation especially amongst older age groups. Many secondary schools are urban or rural and residential with predominantly urban children attending.

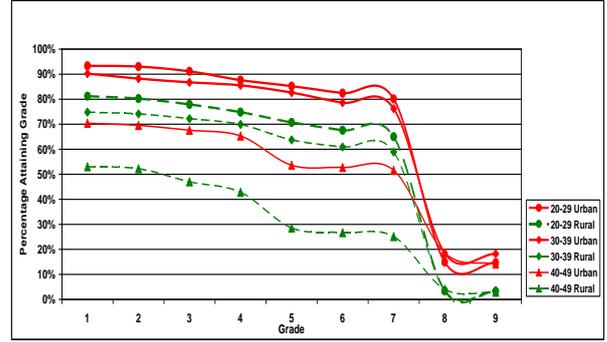
These charts are indicative of continued gaps in access to education associated with rurality. But these have been changing and are generally smaller than in the past. These changes have been accompanied by changes in the proportion of the population that is rural as in all the countries urban migration is significant and can exceed 5% a year. This is generating large informal settlements around some cities e.g. in Capetown, Durban and Johannesburg in South Africa and in Nairobi in Kenya. In these areas schooling opportunity often lags population and generates urban out of school children. This is not visible in the existing data sets.

**Figure 8: Urban Rural Attainment**

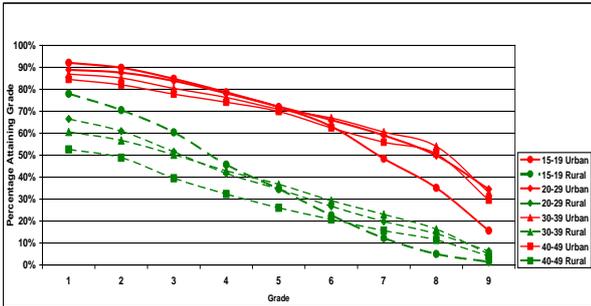
**Uganda**



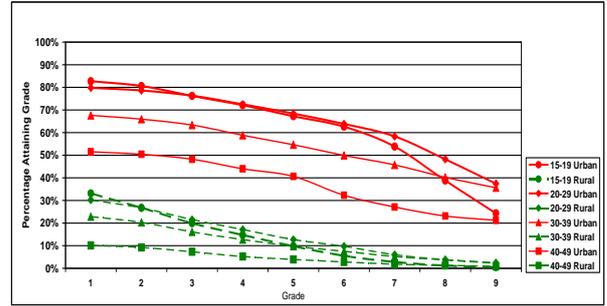
**Tanzania**



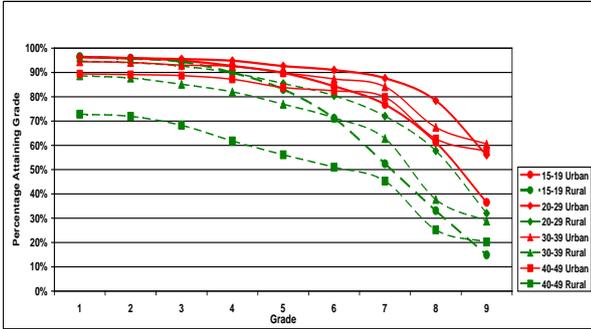
**Malawi**



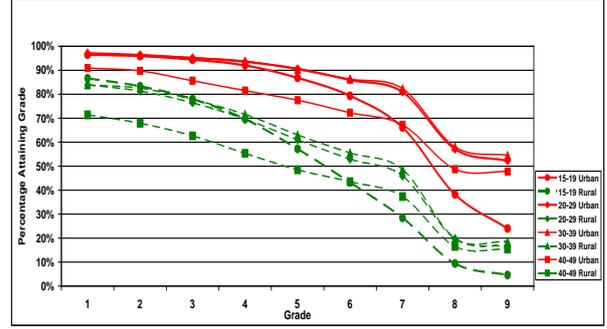
**Ghana**



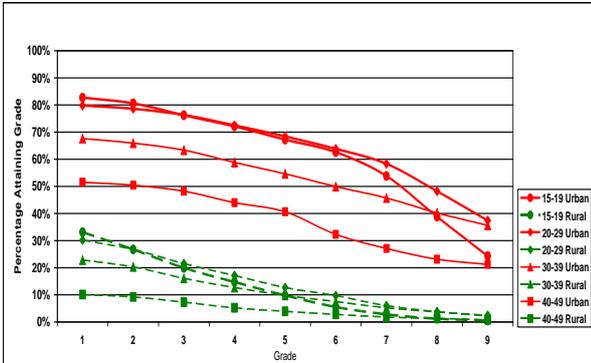
**Kenya**



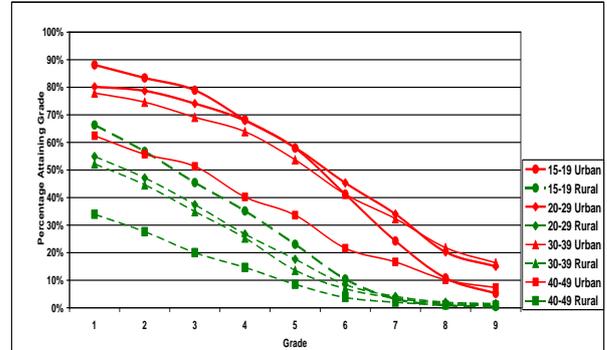
**Zambia**



**Ethiopia**



**Mozambique**



### **3. Exploring Participation, Age, Gender and Performance in Depth – A Case Study in Kenya**

The changing patterns of enrolment discussed above raise many questions about what has been achieved over the last two decades in different countries and what the prospects are for the next decade. The evidence indicates that drop out remains a very considerable problem in all the countries except perhaps South Africa, where there is ample evidence that participation is high but levels of achievement are very disappointing. Though primary enrolments have increased in all the countries it is also clear that completion rates have not improved as fast as the number entering Grade 1 has grown. Primary completers remain a small proportion of the number of children of the appropriate ages. In all the countries surveyed, girls are enrolled in near-equal proportions with boys in the early grades, and in most cases gender parity at primary level is being approached. Alongside these changes the number of children who are over-age for their grade level has remained high and may have increased. This has yet to become a prominent issue in policy dialogue but it is likely to be central to the reasons why sustained gains in overall enrolments are not being reflected in much greater completion rates. Moreover it is likely that being over-age is a function of poverty, and closely associated with low achievement.

The next sections of this paper build on the insights from the changing patterns of access presented in this paper thus far. Drawing on the archives of the Kenya National Examination Council, the case study discusses recent trends in participation and performance in the country's primary leaving examination: the Kenya Certificate of Primary Education, or KCPE. It analyses the effects of candidates' age, gender and locality, and examines the impact of the 2003 Free Primary Education initiative (FPE 2003).

The KCPE archive includes subject-level performance records for every candidate, in every school, back as far as 1994. It constitutes an invaluable research resource; nevertheless it is important to recognise its limitations. We know each candidate's age and gender, together with the name and location of the primary school he or she attended, but nothing about the families and communities they came from, nor the classroom contexts in which they received their education. Equally important, the archive includes no information which enables us to differentiate candidates educated in mainstream, fee-free public schools from the small, but growing, minority who have attended fee-charging private schools.<sup>4</sup>

In the following section we set a context for our analysis. First we outline changes in the structure of the Kenya education system since Independence in 1963, and the changing role which selection examinations have played within that structure. Then we discuss the stratification of secondary-school provision, and its consequences for the life chances of Kenya's primary school leavers.

#### **3.1 Education Structures, Selection Examinations, and Secondary School Stratification**

For the first two decades after Kenya's Independence in 1963, formal education was delivered through a four-cycle structure: a seven-year primary cycle, followed by four years of secondary education, leading to two years of higher secondary education, and finally to a three-year undergraduate degree programme. The flow through each of the three transition points between cycles was regulated by performance in highly-competitive selection examinations. Out of every

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<sup>4</sup> Evidence from other sources indicates not only that private-sector provision of primary education is expanding rapidly, but also that a widening performance gap between private-school and public-school KCPE candidates is developing

100 pupils embarking on their primary education around the time of independence, no more than one or two could expect to surmount all three selection hurdles successfully, and hence qualify for a university place thirteen years later.<sup>5</sup>

In 1985, however, a simplified, three-cycle structure replaced the previous structure: the seven-year primary cycle was extended to eight years; the two secondary cycles were amalgamated into a single four-year cycle, and the undergraduate cycle was extended from three to four years. Similarly the number of selection examinations was reduced from three to two. Popularly known as the 8-4-4 system, this structure continues through to the present day.

The first of the two current selection examinations, the Kenya Certificate of Primary Education (KCPE), will be the main focus of this analysis. It regulates recruitment of primary leavers into the secondary schools, in a process controlled by the Ministry of Education. Subsequently the Kenya Certificate of Secondary Education (KCSE) regulates post-secondary recruitment, but in less-direct fashion: after the examination, candidates receive a certificate recording their achievement, which they then use to seek admission to a university, or as ‘currency’ in the jobs market.

During the early years of independence a place at secondary school was a privilege accessible only to a favoured minority of primary leavers: the transition rate was less than 20%. But over the next two decades there was steady progress towards wider access. By 1972-73 the rate had reached 30%, and by the late 1980s had risen further to between 45% and 48%. Subsequently, however, progress stalled: during the first five years of the new millennium, transition rates ranged between 41% and 46% - marginally lower than they had been during the late 1980s. There was little change until 2007 – one year in advance of the introduction of free secondary-school tuition in 2008. Since then the rate has risen dramatically, to an estimated 70% by 2010. Costs, direct and indirect, are now a more substantive barrier to secondary school access than KCPE performance.<sup>6</sup>

Nevertheless the KCPE remains a high-stakes examination, with profound consequences for candidates’ life chances. Kenya’s secondary schools are formally stratified into a three-tier hierarchy on the basis of their catchment areas - and KCPE results determine which tier candidates are entitled to enter.

- **National** schools, currently just 18 in number, form the top tier. They are highly selective: only about 1% of KCPE candidates, recruited from all over the country on a district quota basis, win places.<sup>7</sup> The national schools include among them the earliest secondary schools in the country, some dating back to the 1920s or 1930s. In consequence, they are ‘strong’ institutions; buttressed by a long history and with influential alumni to support them. The KCPE performance level needed to qualify for a national school varies from district to district, and some national schools are more selective than others. In general, however, a total score of at least 380 (out of a theoretical maximum of 500) is required; often 400 or higher for the most prestigious schools.

- **Provincial** schools form the middle tier. Although some date back to the colonial period, many were established during the first decade of Kenya’s independence, when expansion of

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<sup>5</sup> In the late colonial period there were, for African pupils, no fewer than four selection hurdles. The additional hurdle came after just four years of schooling, breaking the primary cycle into two truncated cycles of four years each. Less than one-third of the pupils sitting this selection examination qualified for the upper-primary cycle.

<sup>6</sup> For a careful analysis of secondary school costs, before and after the abolition of tuition fees in 2008, see Obha (2009)

<sup>7</sup> Proposals currently being discussed would expand the national school system dramatically. Each of the 47 new counties to be established under the new Kenya Constitution in 2012 would have two national schools.

secondary education was a high policy priority. They recruit from within the province where the school is located, again on a district quota basis. Provincial schools are moderately selective: about 20% of KCPE candidates qualify. Recruitment requirements vary widely, but for an established secondary school a well-developed district a KCPE total score of at least 320 is likely to be needed.

- **District** schools constitute the broad base of the secondary education pyramid: at the bottom of the status hierarchy, they make up about 70% of all public secondary schools in Kenya. Most district schools are relatively young; many were originally set up through local community initiative as self-help *Harambee* schools. Unlike the national and provincial schools, district schools do not as a rule have boarding facilities: they recruit local pupils, living for the most part within walking distance. Some district schools set a minimum KCPE score for entry; others are virtually non-selective.

A recent analysis compared the performance of secondary leavers in Central Province, according to the type of school they had attended (Oketch and Somerset, 2010). It was found that among the 2007 leavers from the seven national schools located in the province, as many as two-thirds achieved a grade of B+ or better in the terminating Kenya Certificate of Secondary Education (KCSE) examination - the score needed at the time to gain a maintained place at a public university. By comparison, leavers from the 111 provincial schools were much less successful, only about 7 percent achieving the qualifying grade. But the leavers from the 587 district schools lagged far behind: the proportion qualifying for a maintained university place was as low as one in 200.

It is clear, then, that for primary-school leavers with aspirations to continue their education not only to secondary school but ultimately to university level, performance in the KCPE examination is crucial. For the tiny minority who perform well enough to gain entry to a national secondary school, the prospects of a publicly-funded university education are excellent; whereas for the majority who qualify for a district secondary school only, the prospects are slim indeed.

Table 1 summarises the key features we have highlighted in our discussion of Kenya's stratified secondary-school system<sup>8</sup>.

**Table 1: Stratification Among Kenya's Public Secondary Schools**

School type	Proportion of total sec. schools	Selectivity		Leavers' chances of maintained university place*
		% KCPE candidates admitted	Minimum KCPE score required	
<b>National</b>	< 1% (18 schools)	c. 1%	c. 380	> 50%
<b>Provincial</b>	c. 20%	c. 25%	c. 320	c. 7%
<b>District</b>	c. 80%	Variable (High)	Variable (Low)	c. 0.5%

In the next section we employ data from the archives to analyse current and recent age trends among KCPE candidates. We discuss the effects of FPE 2003, and examine the association between age and KCPE performance.

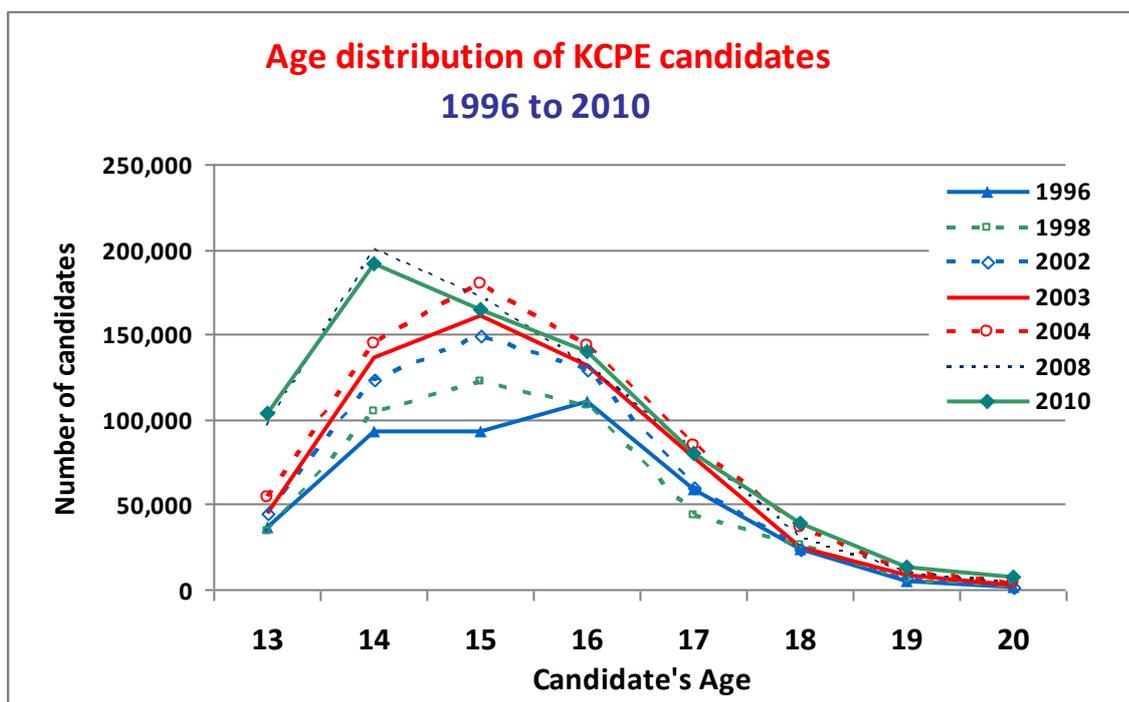
<sup>8</sup> Central Province secondary school leavers, 2007

### **3.2 Recent National Trends in the Age of KCPE Candidates, and the Impact of FPE, 2003.**

Many young children in Kenya start their education at the age of three or four years, in a nursery school or pre-school unit. However formal schooling begins at six or seven years, when pupils enter Grade 1 of the eight-year primary cycle. Those who pass through this cycle without interruption should enter the final grade, and sit the KCPE examination, when they are 13 or 14 years of age.

Figure 9 shows the age distribution of KCPE candidates in various years between 1996 and 2010. Two major trends are apparent: candidates became, on average, gradually younger over this fifteen-year period; but nevertheless their ages continued to be distributed over a broad range.

**Figure 9: Age Distribution of KCPE Candidates, 1996-2010**



In 1996 the modal (most common) age was 16 years; but by 1998, two years later, a small change in the shape of the distribution curve had brought about a drop in the peak age to 15 years. The 15-year-olds remained the largest group for a decade, but the numbers of 14-year-olds rose steadily, until in 2008 they became the modal group for the first time.

But notwithstanding this downward trend in the modal age, there are nevertheless still many pupils in the older age groups. In 1996, the proportion of KCPE candidates aged 15 years or older was a little over 70%. This proportion fell gradually in subsequent years, but in 2010 still amounted to about 60%. It can be seen from Figure 9 that the 2010 age distribution was more strongly right-skewed than the distributions for earlier years. There were in fact more KCPE candidates aged between 17 and 20 years in 2010 than there had been in any previous year.

As a shorthand for the purposes of subsequent analysis, we define pupils aged 17 to 20 as *over-age* (at least three years older than the expected 13-14 years).<sup>9</sup> Employing this definition, around 19% of 2010 KCPE candidates were over-age. Candidates of appropriate age, 13 or 14 years, made up 40% of the population; while the 15- and 16-year-olds made up the remaining 41%.

These over-age candidates fall into three distinct, if overlapping, groups:

- First, the **late entrants**: pupils who were more than seven years old when they first entered Grade 1;
- Second, the **repeaters**: pupils who repeated one or more grades during the primary cycle;
- Third, the **returnees**: pupils who dropped out from school, and subsequently returned to resume their education (in recent years, often as a consequence of FPE 2003).

Without longitudinal follow-up data from a cohort of primary school entrants, it is impossible to determine which of the three groups is largest. Some KCPE candidates, of course, will be in two or even all three groups: dropouts, for example, are frequently required to repeat a grade when they return to school.

### **3.3 The Impact of FPE 2003**

Any analysis of current age trends among KCPE candidates must take into account the effects of the Free Primary Education (FPE) initiative of 2003.<sup>10</sup> These effects are clearly apparent in Figure 10, which shows cohort survival curves starting with the Grade 1 intake of 1993 and following through the FPE year and on to 2006.<sup>11</sup>

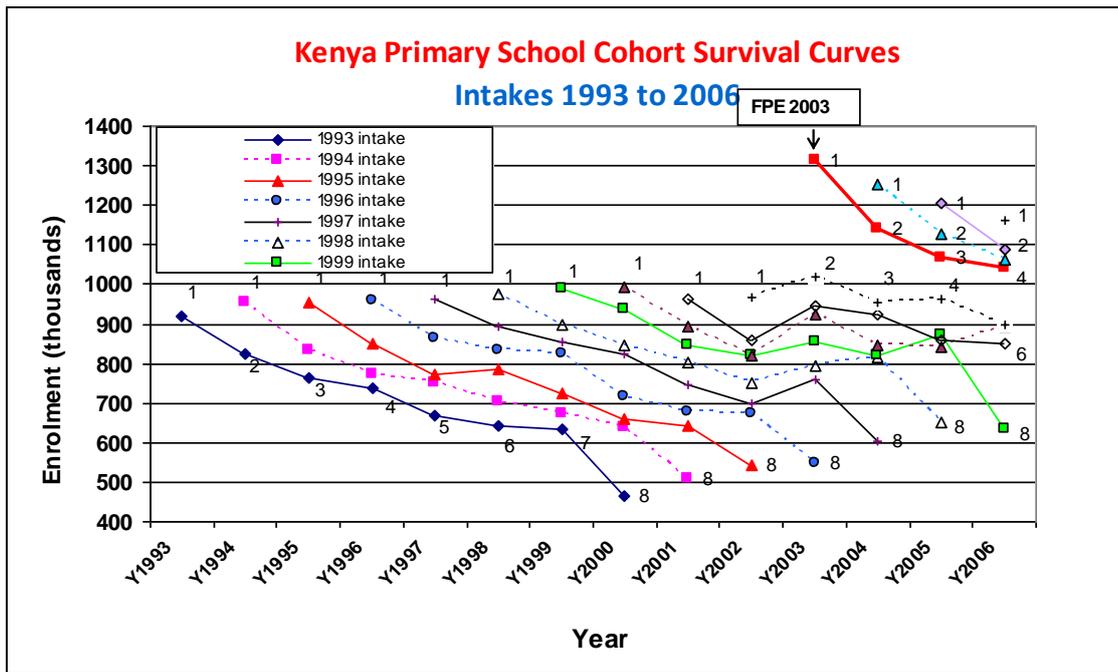
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<sup>9</sup> This is of course a conservative definition. A strong case could be made for setting the lower age boundary at 16 or even 15 years. Small numbers of candidates aged 21 and over are excluded. A high proportion of these are likely to have been enrolled in adult education programmes.

<sup>10</sup> FPE 2003 had in fact been preceded by two earlier programmes also directed at achieving free primary education in Kenya; the first in 1974, the second in 1979. Sifuna (2007) and Somerset (2009) provide analyses of these previous initiatives.

<sup>11</sup> An earlier version of this chart has been published elsewhere (Somerset 2009, Fig 5). The curves are constructed by linking the Grade 1 enrolment in each year to the Grade 2 enrolment in the following year; and so on through to Grade 8. Being constructed from cross sectional rather than longitudinal data, the curves are of course not true cohort curves: they are shaped by repetition and re-entry as well as by dropout.

Figure 10: Kenya Primary School Survival Curves, 1993-2006



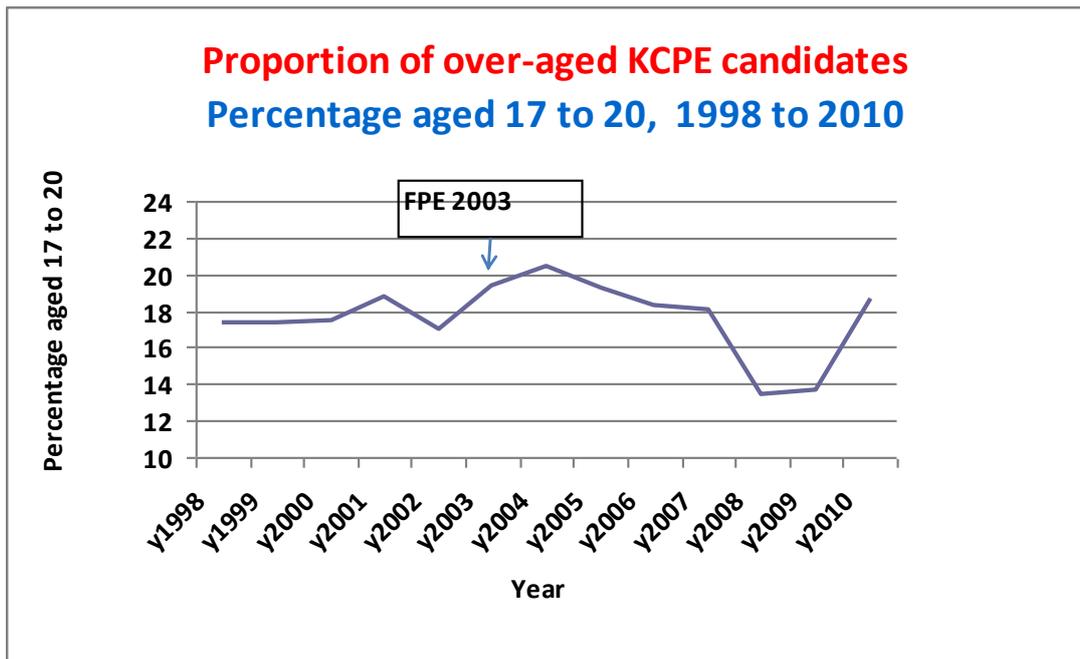
It is evident that FPE 2003 had profound consequences for the basic education system in Kenya:

- The Grade 1 intake jumped sharply, from 970,000 in 2002 to 1,300,000 in 2003, an increase of nearly 35%. Prior to 2003, intakes had been on a plateau for more than a decade, a consequence of the introduction of substantial school fees in 1988, as a component of the IMF-promoted cost-sharing programme.<sup>12</sup> Almost certainly, most of the additional entrants recruited in 2003 were over-age; encouraged to start a delayed education by the prospect, after the prolonged cost-sharing period, of free schooling.
- Enrolments in Grades 2 to 7 also increased, although by lower proportions. Clearly many pupils returned to school, to resume an interrupted education. Most of these would certainly have been over-age.

These FPE recruits – the large group of late-enrolees and the smaller groups of returnees – passed through the primary cycle between 2003 and 2010; the returnees reaching Grade 8 between 2003 and 2009, most of the late-enrolees in 2010. Figure 11 shows their impact on the proportion of over-age candidates sitting the KCPE examination.

<sup>12</sup> For more details of the cost-sharing programme and its impact on enrolments, see Bedi et al (2004) and Somerset (2009).

**Figure 11: Proportion of Over-aged KCPE Candidates 17-20 Years Old, 1998-2010**



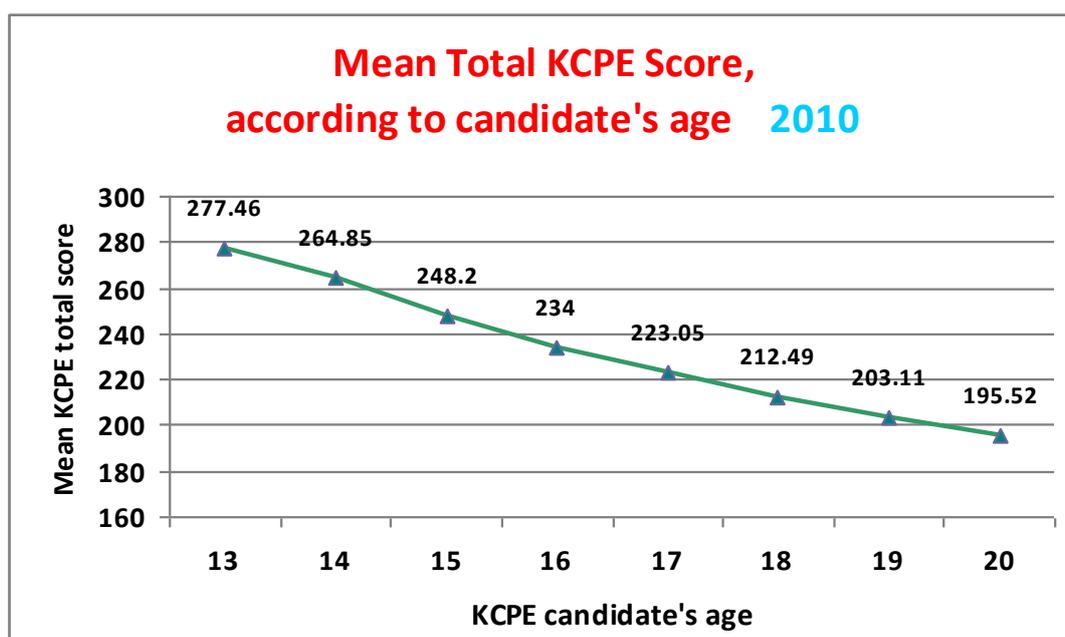
Between 1998 and 2002, it will be seen, about 18% of candidates were over-age (17 to 20 years old) each year. However this proportion rose to around 20% in 2003, 2004, and 2005 – inflated by pupils returning to the upper primary grades to resume their education following FPE 2003. Over the next three years the proportion fell to only about 14%, suggesting that most of the FPE returnees who re-entered the lower grades in 2003 dropped out again before completing the primary cycle. Finally in 2010, however, there was a sharp upward spike to a figure of 19%; almost certainly the consequence of the high proportion of late entrants in the Grade 1 intake of 2003.

Judging from these trends it seems very likely that in 2011 and subsequent years, the proportion of over-age pupils sitting KCPE will drop considerably. By 2012, very few of the FPE enrolees will remain in the primary system.

### **3.4 Age and KCPE Performance**

Figure 12 shows the association between KCPE candidates' ages and their mean total scores, for the 740,000 candidates who sat the examination in 2010. The strength and consistency of the association across most of the age range is remarkable: except among the oldest pupils, each one-year increase in age is associated with a 10 to 15 point drop in mean total score. Among the youngest candidates, the fourteen-year-olds average more than twelve points lower than the thirteen-year-olds - despite their relatively greater physical and cognitive maturity.

Figure 12: Mean Total Score by Age, 2010



But however straightforward the statistical association between age and KCPE performance may be, interpretation of its meaning is certainly not. As we have noted, three types of experience, singly or in combination, can lead to a candidate being over-age: **late entry** to school; **repetition** of one or more grades; or **dropout and subsequent return** to school. Without longitudinal follow-up data from an intensive study it is impossible to determine which type of experience contributes most to underperformance in the examination.

Although officially discouraged, repetition is in fact still common practice in many Kenya primary schools, especially those in rural areas. Teachers employ repetition as a rough-and-ready approach to remediation: lacking the skills – or sometimes the commitment - needed to provide remedial help to individual slow learners, they require those who fail to demonstrate sufficient mastery of subject content in class tests and end-of-year examinations to repeat the whole year. In effect, they attempt to reduce cognitive heterogeneity by substituting age heterogeneity. Hence it would be surprising if pupils who have repeated one or more years were to perform in the KCPE at par with pupils who have passed straight through the primary cycle without interruption.

Data from a small-scale study of 2007 KCPE candidates carried out in Nyeri District and Nairobi City, set out in Table 2, provide limited confirmatory evidence:

**Table 2: Mean 2007 KCPE Scores of Repeaters and Non-repeaters; Nyeri District and Nairobi City**

	Nyeri (3 schools)		Nairobi (3 schools)	
	Mean KCPE score	n	Mean KCPE score	n
Non-repeaters	281.58	64	276.15	71
Repeated once	254.47	36	245.64	28
Repeated twice or more	250.88	9	225.30	13

Interpretation must of course be cautious because the samples are small and unrepresentative; nevertheless in both Nyeri and Nairobi, pupils who had completed the primary course without repeating any grade enjoyed a clear performance advantage over the repeaters, especially those who had repeated twice or more.<sup>13</sup>

But as to the effects of late school entry on performance, evidence is at present lacking. It may be that there is a critical threshold age for starting formal schooling, beyond which late starters are likely to be handicapped in their learning. Another possibility is that the late starters may tend to be concentrated in the less-developed, more-isolated rural areas, or in the urban slums; and that it is the quality of the instruction they receive, rather than their cognitive capacity, which is responsible for their low levels of achievement. On the other hand it is also possible that in propitious circumstances late entry may confer an advantage: the older learners may be cognitively more mature, and thus better able to benefit from effective teaching than their younger colleagues. In the absence of data from a well-controlled longitudinal study, the issue cannot be resolved.

Even without this evidence, however, it is apparent that from a classroom perspective, reduction of age heterogeneity would bring substantial benefits. In classes where all pupils are of roughly the same level of both physical and cognitive maturity, management is likely to be more straightforward, pedagogy more effective, and social cohesion among the pupils stronger.<sup>14</sup> Few teacher development programmes, either pre-service or in-service, devote sufficient attention to developing the skills needed for teaching pupils of differing age or ability levels, nor to remedial techniques for slow learners.

But whatever uncertainties there may be as to the reasons for the association between age and KCPE performance, there can be none as to its consequences for access to secondary and post-secondary opportunities. Kenya's public secondary education system, it will be recalled from the introductory section to this paper, is formally stratified into three tiers; the highly-prestigious national schools forming the top tier, the provincial schools the middle tier, and the district schools the bottom tier. Access to the upper two tiers is governed by performance in the KCPE examination. The national schools are highly selective: only about 1% of KCPE candidates are recruited, and a score of around 380 or higher is generally needed. The provincial schools are moderately selective: about 15-20% of KCPE candidates are recruited, and in most cases a minimum score of about 320 will gain a place. But the district schools are largely unselective: some set a minimum KCPE performance criterion; others will accept virtually any primary school leaver who can meet the costs.

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<sup>13</sup> Similar patterns were found in a small-scale study carried out nearly four decades ago, also in Nyeri District. There was, however, a twist to these earlier results: while pupils who repeated a lower grade were *less* successful than the non-repeaters, those pupils who repeated the final grade, and sat the selection examination a second time, were substantially *more* successful than those sitting for the first time. It seems that these final-grade repeaters were a quite different group from those who had repeated earlier in the primary cycle. At a time when the chances of winning a place in a public secondary school were less than 15%, they were able pupils who had almost succeeded at their first attempt, rather than slow-learning pupils who had failed an internal examination in a lower grade (Somerset 1974). Except in special circumstances, repeating the KCPE examination is now prohibited.

<sup>14</sup> In one of the schools visited during the small-scale study referred to above, a substantial group of over-age pupils in the Grade 8 class tended to be marginalised during lessons – but dominated the school football team!

**Figure 13: Percentage of Candidates Achieving Scores of at least 380 and 320 by Age, 2010**

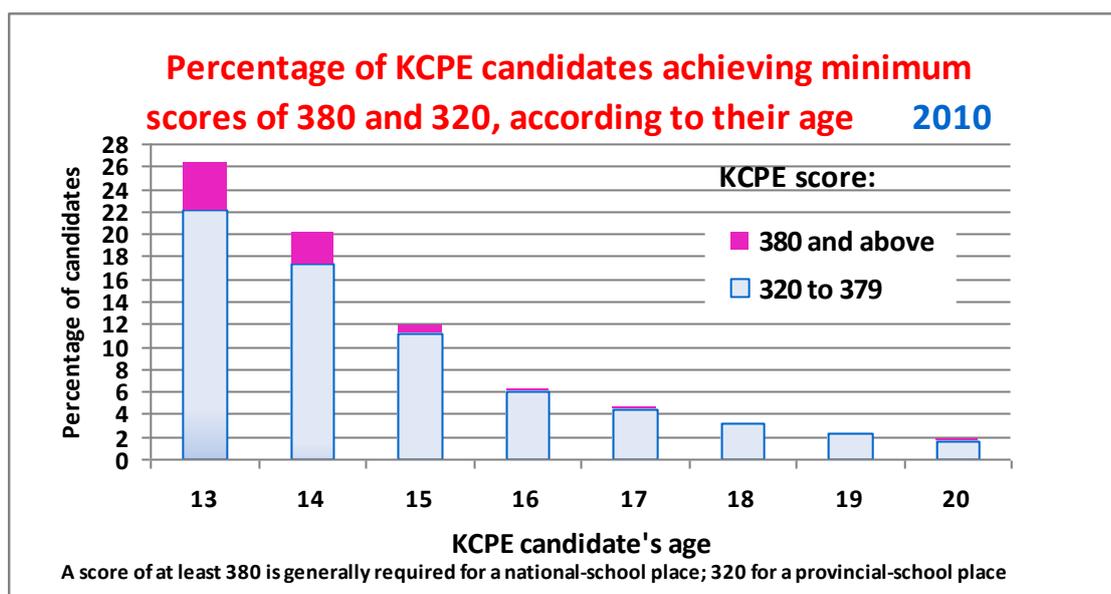


Figure 13 plots the proportion of 2010 KCPE candidates achieving the approximate minimum scores needed for a place at a national or a provincial school (380 and 320 respectively), according to the candidate's age. The huge advantage of the youngest candidates, particularly in qualifying for the national schools, is clearly apparent. As many as 4.3% of the 13-year-olds achieved the minimum score of 380 points needed in most regions for a national-school place. This proportion drops to only 2.8% for the 14-year-olds, and then plummets to just 0.8% and 0.3% for the 15 and 16-year-olds respectively. Finally for the oldest pupils, the chances of a national-school place are miniscule: less than one in 1000 of the 17 to 20-year olds achieved the minimum 380 points.

Older candidates fared a little better in the competition for provincial-school places. Exactly 6% of the 16-year-olds reached or surpassed the approximate minimum score of 320; while even among the over-age candidates the proportions were not insignificant: 4.4% in the case of the 17-year-olds; 1.8% among the 20-year olds. Nevertheless the younger candidates still enjoyed a massive advantage: comparable proportions among the 13 and 14-year-olds were 26% and 20% respectively.

The implications of these patterns for access to post-secondary opportunities are clear. As already discussed, graduates from the seven national schools located in Central Province had, in 2007, a better-than-even chance of qualifying for a maintained place in a public university whereas for provincial-school graduates the chances were about one in 15, and for district-school graduates, only about one in 200.

So the pupils who sit the KCPE when they are 13 or 14 years of age enjoy a double advantage over their older classmates: on average they perform better in the KCPE examination, as a consequence of which they are much more likely to enter a prestigious national or provincial secondary school, where their prospects of a university place are greatly enhanced.

### **3.5 Regional variations in the proportions of over-age KCPE candidates**

In the previous section we considered the national age distribution of KCPE candidates, looking at changes over time, and the association with performance levels. Within the national patterns, however, there are substantial regional variations, and to these we now turn our attention.

Local government in Kenya is currently in a state of transition. With the new National Constitution due to come into effect in 2012, the old provinces, eight in number, will cease to function as administrative entities, although doubtless the names will survive as geographical markers. Instead 47 new counties, each with an elected governor, an elected senate, and with revenue-raising powers, will become the key units of local government. Given that provincial administration will soon come to an end, we decided to analyse the KCPE data on the basis of the boundaries of the new counties – albeit they have not yet formally come into being.

Table A1, an annex to this paper, sets out county-level data for the 2010 KCPE examination according to three key parameters: first, the proportions of candidates that were over-age (17 to 20 years old); second, the participation of girls in the KCPE, measured in terms of the Gender Parity Index (i.e., the proportion of girls sitting the examination for every 100 boys); and third, the relative performance of girls, measured in terms of the difference in mean total KCPE score between boys and girls. In this section we focus on the first of these parameters.

It will be seen from Table A1 that there was huge variation among the 47 counties in terms of the proportions of over-age candidates. At one extreme, exactly half (50.0%) the candidates in Kwale County were over-age, and the proportion was not much lower in Kilifi (45.6%). Other counties with high proportions included Lamu (34.9%) and Kakamega (30.9%).

In sharp contrast, only around one in twenty candidates in Baringo (4.7%) and Bomet (5.4%) were over-age; while other counties with low proportions included Nyamira (7.4%) and Kiambu (8.0%) together with Nairobi City (8.4%).

Map 1, on the following page, displays these variations geographically, though a colour-spectrum code. In 2010, the national proportion of over-age candidates was 18.7%. Violet and blue, at the ‘cool’ end of the spectrum, indicate counties where the proportion of over-age pupils was below the national average (less than 10%; and 10 to 14.9% respectively); green (15 to 19.9%) indicates counties close to the national average; while the ‘hot’ colours, yellow (20 to 24.9%) orange (25 to 34.9%) and red (35% and over), indicate in succession counties with increasingly larger proportions of over-age candidates.

Clear-cut geographical patterns are evident:

- The counties with above-average proportions of over-age KCPE candidates cluster in two widely-separated ‘over-age hot-spots’. The first cluster is located to the far east of the Republic. It centres on the adjacent coastal counties of Kwale and Kilifi, to the south and north of the major port of Mombasa. In Kwale, as we have noted, exactly half the 2010 KCPE candidates were aged 17 or over (50.0%); while in Kilifi the proportion was not far behind (45.6%). These levels were both well over twice the national average proportion of 18.7%. The coastal county of Lamu (34.9%) is also a member of the cluster, as is the inland county of Taita-Taveta (29.8%), adjacent to both Kwale and Kilifi, and its neighbour, Kitui (26.7%).
- The second cluster, by contrast, is located in the far west; adjacent to the shores of Lake Victoria and the boundary with Uganda. Less sharply defined but more closely grouped than the eastern cluster, its core members are Kakamega (30.9%), Busia (30.0%), Vihiga (29.9%), and Siaya (25.6%).
- Between the eastern and western clusters lies a continuous belt, made up of virtually all the counties where the proportion of over-age candidates is lower than the national

average (colour coded violet or blue). It runs roughly north and south, from the northern border with Ethiopia (Marsabit and Wajir, 9.1% and 8.2%) to the southern border with Tanzania (Narok and Migori, 8.7% and 12.9%). Baringo, with the lowest proportion of over-age candidates in the Republic (4.7%), lies in the centre of the belt; but a continuous ribbon of counties, all in the violet zone (proportions less than 10%) runs southwards from Baringo to the Tanzania border.

These well-defined geographical patterns are clearly far from random. They derive from large sub-populations, ranging typically from around 10,000 to 30,000; but even if the sub-populations had been smaller, such regularity could not have arisen from chance variation.<sup>15</sup>

For the moment at least, however, the causal factors – economic, political, social, cultural, historical – which might help explain the patterns remain elusive. It is evident that neither land potential nor the level of socioeconomic development have any direct effect. Nairobi City, together with Kiambu, Murang'a, Nyeri and Kirinyaga - the high-potential, well-developed rural counties to the north of the city - are all in the blue or violet zones. But so also are Wajir, Marsabit, Isiolo, Samburu, and Narok – some of the most arid, sparsely-populated counties in the Republic; all of them subject to periodic drought and famine.

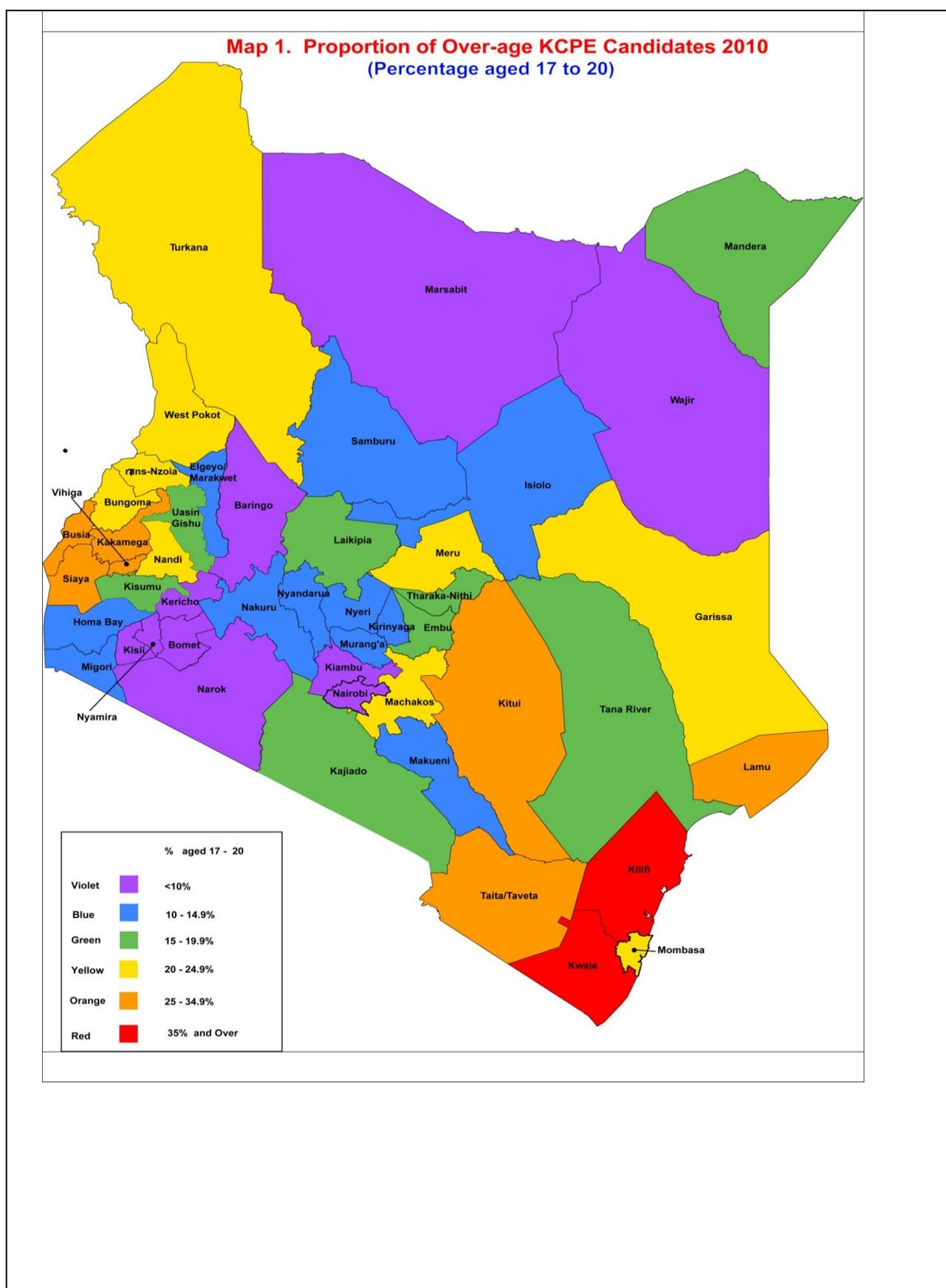
Further, there is little evidence that old provincial administrative structure had any marked impact. For example Garissa, Wajir and Mandera, which made up the North-Eastern Province, are in the yellow, violet and green colour zones respectively. The counties which constituted Nyanza Province are similarly heterogeneous: Migori and Homa Bay, both in the blue zone (11.6% and 12.9% respectively), had about half as many over-age pupils as Siaya, in the orange zone (25.9%). Nor do linguistic and socio-cultural factors seem important. The communities living in the two main areas where over-age pupils are most common – in the east along the Kenya coast and in the west near Lake Victoria and the Uganda border – are widely separated from each other and very distinct; as are the communities living in different parts of the central belt where over-age pupils are relatively few.

So from the information available at present, the meaning of the patterns remains obscure. We have reached the limits of what can be learned through macroscopic analysis alone. Directed enquiry at the local level, employing qualitative as well as quantitative approaches, could doubtless yield useful insights.

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<sup>15</sup> Only two counties, Lamu and Isiolo, offered fewer than 2,000 KCPE candidates in 2010.

**Map 1: Proportion of Over-age KCPE Candidates, 2010**



### 3.6 Girls' Participation and Performance in the KCPE Examination.

Until the final years of Kenya's colonial period relatively few girls ever embarked on a primary education; even fewer reached the final grade, and had the chance to compete for a secondary-school place. In 1963, Kenya's Independence year, the Gender Parity Index (GPI) among final-grade primary pupils was just 21: for every 100 boys, there were only 21 girls.

During the early years of independence, however, rapid changes in social attitudes towards the education of girls led to remarkable improvements in participation rates. In the brief seven years between 1963 and 1970, the final-grade GPI more than doubled; from 21 points in the former year to 49 in the latter. The next two decades brought further striking increases; raising the index to 74 by 1980, and to 83 by 1990.

**Figure 14: Number of Girls Sitting KCPE for Every 100 Boys, 1994-2010**

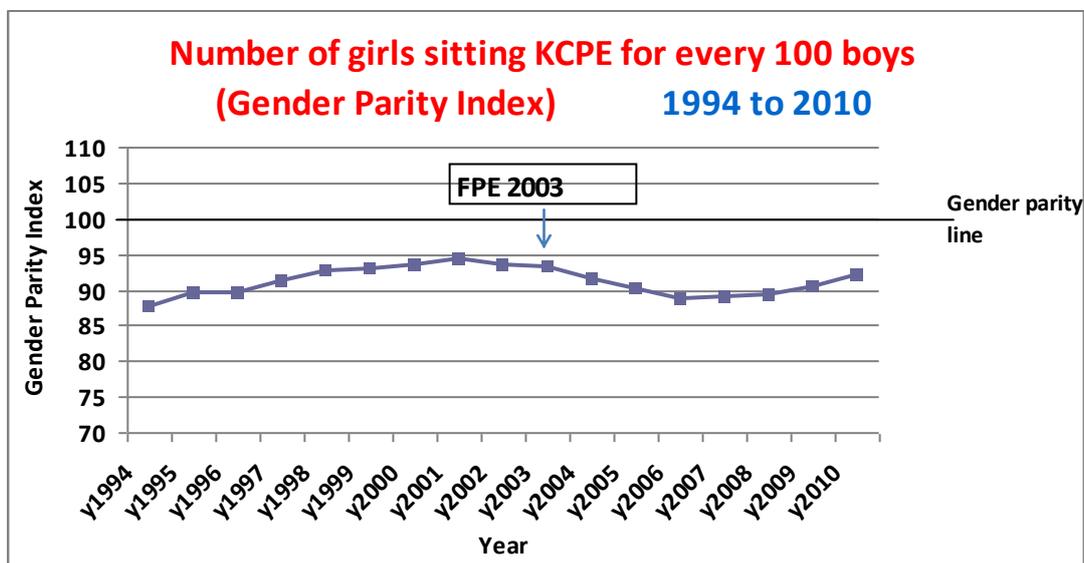


Figure 14 shows KCPE Gender Parity Indices for the years 1994 to 2010. They are based on the relative numbers of girls sitting the KCPE examination, rather than on final-grade enrolments as in the analysis of earlier trends in the previous paragraphs.

In the seven years following 1994 the GPI rose steadily, by about one point per year, from around 87 points in 1994 to a peak of just over 94 in 2001. Thereafter, however, the index slipped back, falling to only 89 by 2006. It seems probable that with the abolition of fees in 2003, boys who had previously dropped out tended to return to school, especially to the upper grades, in larger numbers than girls.

Since 2007 the GPI has recovered a little, reaching 92 in 2010. Given that most members of the last major group of FPE recruits – the late entrants who started a delayed education in 2003 - will have completed the primary course in 2010, there is likely to be further progress towards gender equity in KCPE participation from 2011 onwards.

### **3.7 Regional Variations in Girls' KCPE Participation**

At the national level, as we have just seen, around 92 girls sat the 2010 KCPE examination for every 100 boys. However within this overall picture, there were massive variations among the counties. The relevant data are included in Table A1.

In no fewer than 12 of the 47 counties, gender parity in KCPE participation has already been achieved (GPI 100 or higher); while in a number of these, girls are now in a clear majority. The highest GPI was in Meru (111), closely followed by Vihiga (110) and Embu (108).

In sharp contrast, girls make up well under one-third of the total candidates in Mandera (39), Garissa (40) and Wajir (40), and are also heavily under-represented in Turkana (54), Tana River (58), and Samburu (59). Other counties in which the GPI is below the national average by 20 points or more are Marsabit (64), Narok (65), Migori (69), West Pokot (71), Kwale (72) and Homa Bay (72).

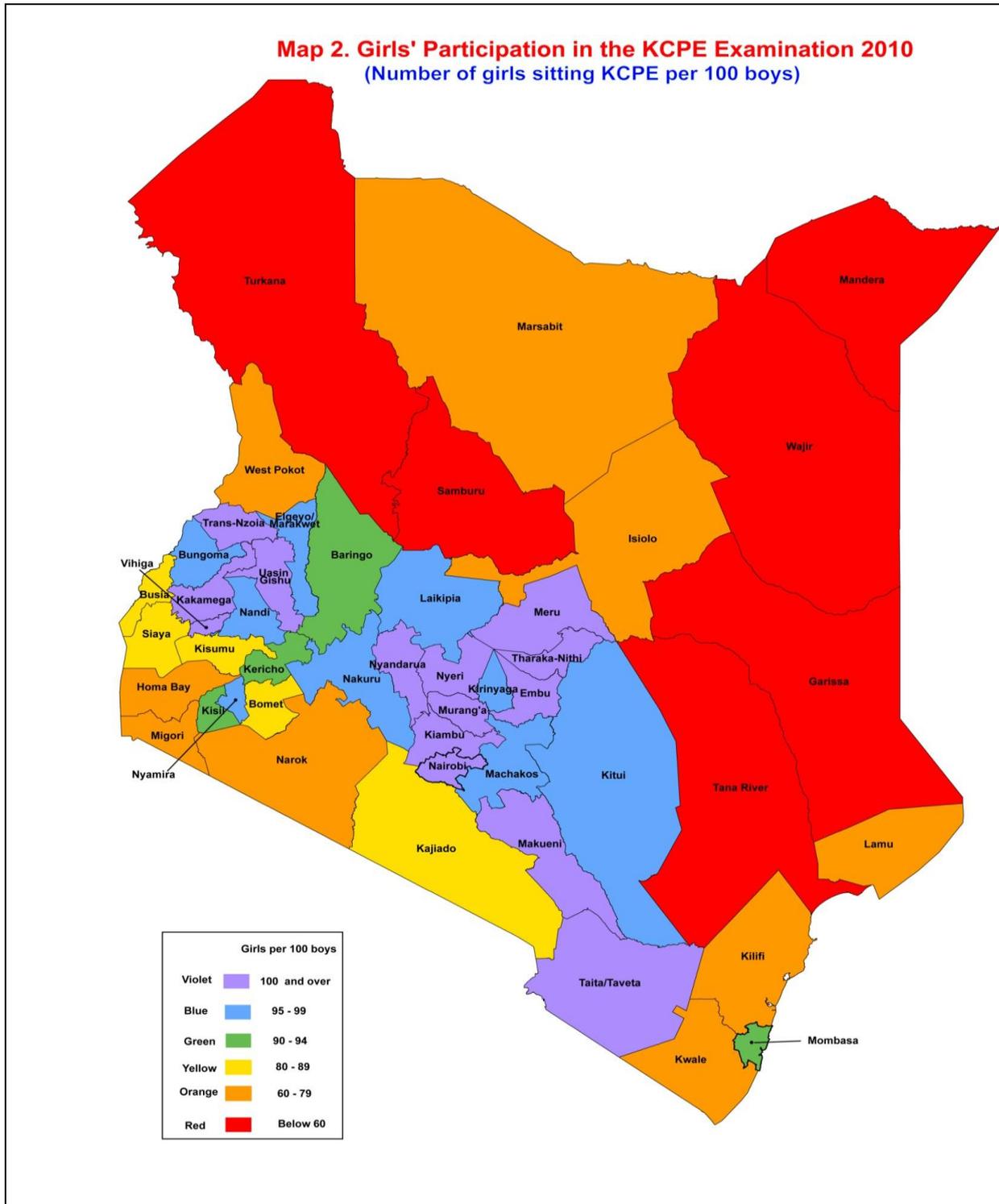
Map 2, on the next page, shows the geographical distribution of these KCPE-participation differences. As before, a colour-spectrum coding scheme is employed; the 'warm' and 'hot' colours signifying counties where the gender disparities are greatest. Violet, at the cool end of the spectrum, indicates counties where girls sit the examination in equal numbers with boys, or are in the majority (GPI 100 and over). Counties approaching gender parity (95 to 99), or with indices close to the national average (90 to 94) are signified by blue and green respectively; while yellow (80 to 89), orange (60 to 79) and red (below 60) identify counties with increasingly wide levels of disparity.

It is immediately apparent that there is a strong geographical dimension to the gender differences. Virtually without exception, the counties where girls have the best chances of completing the primary cycle and participating in the KCPE examination – those colour-coded violet, blue and green – fall within a clearly-defined, crescent-shaped zone, spanning the country from Bungoma and Tranz-Nzioa on the Uganda border in the west, to Taita-Taveta on the Tanzania border in the south-east. In between, the zone includes the counties of the central Rift Valley, together with the counties situated on the slopes of Mount Kenya and the Aberdare Mountains, to the north of Nairobi.

To the north and east of this central zone, girls' KCPE participation rates are sharply lower. GPIs range downwards from 77 and 75 in the coastal counties of Lamu and Kilifi, to 39 in Mandara and 40 in Wajir and Garissa, all on the Somalia border. The single exception is Mombasa Municipality, Kenya's second urban area and main port, where the GPI, at 93, is close to the national average. To the south and west of the central zone, participation rates are again lower, although the contrasts are less pronounced. The lowest GPIs are in Narok (65), Migori (69) and Homa Bay (72), all on the south-western border with Tanzania.

At a first glance, the gender-disparity patterns evident in this map may seem similar to the over-age patterns to be seen in Map 1, discussed in the previous section. In both instances, a central zone where over-age pupils are fewest, or alternatively gender disparities lowest, separates zones to either side where over-age pupils are relatively frequent – or the proportion of girls sitting the examination relatively low.

**Map 2: Girls' Participation in the KPCE Examination, 2010**



In fact, however, the two central zones differ radically from each other; not so much in their shape, as in their geographical alignment. The counties with relatively few over-age candidates are located, for the most part, along an axis running from north-east to south-west; whereas nearly all the counties where girls' participation rates are high are situated along a curvilinear axis running from west to south-east.

In the areas near where the two geographical axes intersect, there is a group of about 15 counties which fall within the cool-colour zones for both dimensions (low proportions of over-age candidates, high girls' participation rates). These include Nyamira, Elgeo Marakwet, Nakuru, Nyandarua, Nyeri, Kirinyaga, Muranga and Kiambu counties, together with Nairobi City – all of them coded violet or blue on both scales.

Away from these areas, however, there are often sharp contrasts. In Wajir, Marsabit and Narok, for example, girls lag well behind boys in KCPE participation (GPIs 40, 64 and 65 respectively); nevertheless the proportions of over-age candidates are among the lowest in the country (9.1%, 8.2% and 8.7% respectively). Conversely in Taita-Taveta, parity between boys and girls in KCPE participation has already been achieved (GPI 101) but the proportion of over-age candidates is more than ten percentage points higher than the national average (29.8%).

Before these data were analysed our expectation had been that the two dimensions would be quite closely related: the counties where delayed completion of the primary cycle was most common would also tend to be the counties where gender disparities were greatest. But as we have just seen, the evidence shows otherwise. Statistically, the variables are quite unrelated: the correlation coefficient<sup>16</sup> between them is -0.01.

The gender-disparity patterns shown in Map 2 do, in fact, yield to interpretation more readily than the patterns for over-age candidature, discussed in the previous section and shown in Map 1. A widely used classification of Kenya's rural areas divides the country's land surface into three broad zones: arid, semi-arid, and non-arid<sup>17</sup>. The arid districts, eleven in number, form a continuous belt across northern and north-eastern Kenya, and cover about 60% of the total land area of the country. The 17 semi-arid districts are more heterogeneous in their location. Some lie to the south of the arid belt; others along the coast, a third group along the Tanzania border.<sup>18</sup>

In the arid districts especially, rainfall is sparse and irregular; so that land potential is low, and household incomes are dependent almost entirely on the livestock economy. In recent years prolonged drought has decimated the herds; in consequence most of the arid districts are currently (2011) in the grip of severe famine.

Not surprisingly, girls living in the arid and semi-arid areas are, in general, at a disadvantage in gaining access to a primary education, compared with those living in the more favoured areas, better-resourced and with higher levels of development. In Map 2, six counties are coded red, indicating wide gender disparities (GPI below 60). All of them, without exception, are included in the arid zone. A further nine counties are coded orange, indicating moderate gender disparities (GPI between 60 and 79). Two of these are classified as arid, and five of the remaining seven as semi-arid. At the other end of the spectrum, most of the counties coded violet or blue, with above-average girls' participation rates, are classified as non-arid. Clearly, the resources available in the area where a girl lives have a major effect on her chances of completing a primary education.

Nevertheless, there are a number of counties, in various parts of the country, which do not conform to this general trend. For example the adjacent counties of Makueni and Kitui, inland from the

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<sup>16</sup> Pearson product-moment

<sup>17</sup> The classification was established by the Arid Lands Resource Management Project, funded by the World Bank and now in its second phase.

<sup>18</sup> The boundaries of these districts, arid and semi-arid, do not always correspond exactly with the boundaries of the newly-created counties on which the analysis in this paper is based; nevertheless they are close enough for comparison to be meaningful.

Coast, are both semi-arid; but despite this both have achieved gender parity in KCPE participation (GPIs 99 and 101 respectively). Conversely Migori and Homa Bay, in the south-western corner of the country, are both non-arid counties, but nevertheless have gender disparities which are much wider than the national average (GPIs 69 and 72 respectively).

It is clear, then, that although the resources available in the local economy have a substantial impact on girls' educational chances, they are not the only determinants. In all likelihood, social, cultural and perhaps historical factors are also involved. Local enquiry, especially in counties where girls' participation rates seem inconsistent with local resource levels, could doubtless lead to insights as to what these non-economic factors are, and the processes through which they produce their effects.

### **3.8 Girls' KCPE performance**

As we have just seen, girls now sit the KCPE examination in equal numbers with boys in a number of Kenya's better-resourced counties, although at the national level, gender parity has yet to be achieved. Girls' performance in the examination similarly lags behind. Table 3 shows the differences in mean KCPE total scores between boys and girls for the years 2001, 2006 and 2010, with the GPI data for comparison. The total KCPE score is calculated by summing candidates' standard scores in each of five subject areas (English, Kiswahili, mathematics, science, and a general paper).<sup>19</sup>

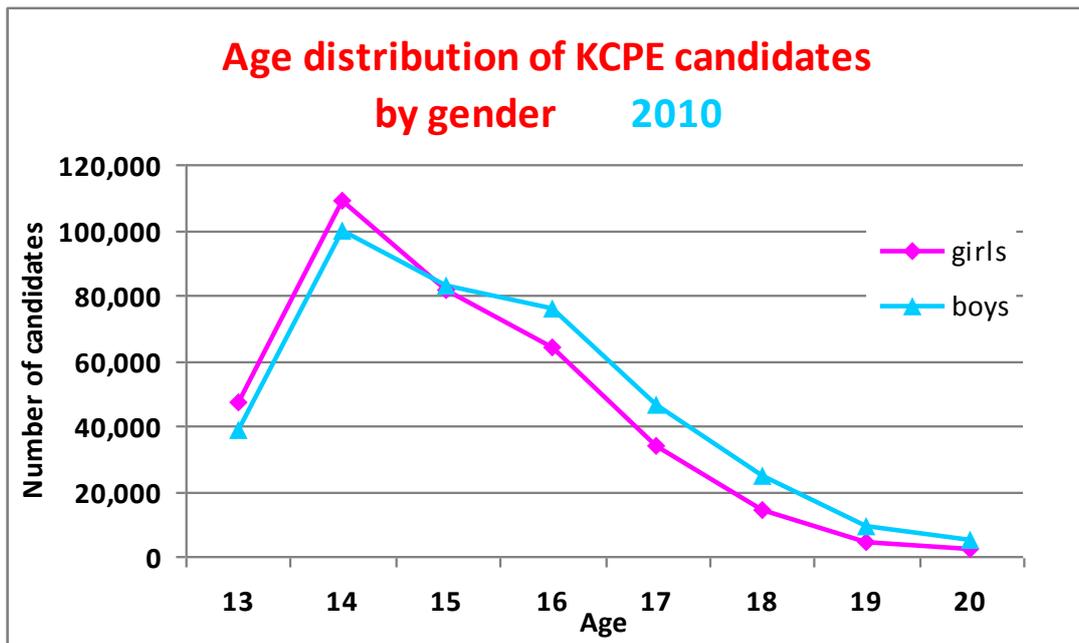
**Table 3: Gender Differences in Mean KCPE Total Scores, 2001, 2006 and 2010**

Year	Candidates			Mean KCPE total score		
	Boys	Girls	GPI	Boys	Girls	Difference
2001	261,934	247,142	94.4	255.07	239.53	15.54
2006	350,134	310,421	88.7	253.83	240.39	13.44
2010	385,304	354,414	92.0	252.42	242.14	10.28

Over the ten years 2001 to 2010 the performance gap between boys and girls narrowed by about one-third, but still (in 2010) amounts to more than ten points. The GPI shows a contrasting pattern. In 2001 it stood at 94.4, an all-time peak; but slipped back more than five points in the years following the Free Primary Education programme of 2003, before recovering to 92.0 in 2010.

<sup>19</sup> Standardisation (to a mean of 50 and standard deviation of 15) is employed to ensure that each subject area contributes equal variance to the overall result.

Figure 15: Age Distribution of KCPE Candidates by Gender, 2010

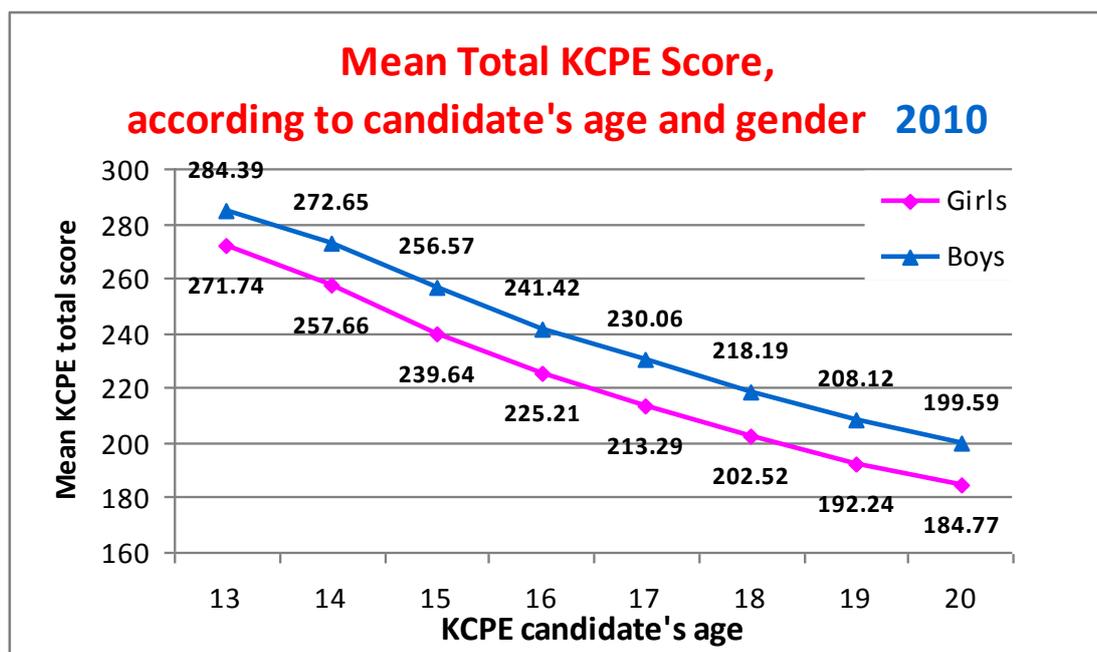


In interpreting the performance differences it is relevant to note that on average, girls tend to be younger than boys when they sit the KCPE. Figure 15 compares the two age distributions, for the year 2010.

Girls clearly outnumber boys among the 13 and 14 year olds, whereas boys are in a substantial majority among those aged 16 and over. But as we have discussed in a previous section, KCPE performance is strongly associated with age: younger candidates achieve on average much higher scores than older candidates. So when we compare the performance of boys and girls holding age constant, the gender gap widens.<sup>20</sup> Figure 16 shows the patterns.

<sup>20</sup> Similarly, when gender is held constant, the association between age and KCPE performance strengthens.

**Figure 16: Mean Total KCPE Score by Age and Gender, 2010**



The two regression lines, it will be seen, are nearly parallel to each other: the relationship between age and KCPE performance is almost identical for boys and girls. But at each and every specific age level, the performance gap in favour of the boys is *wider* than it is among the total population of candidates. The gap ranges upwards from 12.65 points, among the 13-year-olds, to more than 16 points for several of the older age-groups – compared to only 10.28 points for the total population.

These results provide evidence of the need to enquire into the effects of correlated independent variables when analysing results from empirical social research. Controlling for the effects of age does not, of course, change the major conclusion to be drawn from the aggregate statistics as to the gender gap in KCPE performance; but it does modify quite substantially our estimate as to how wide the disparity is.<sup>21</sup>

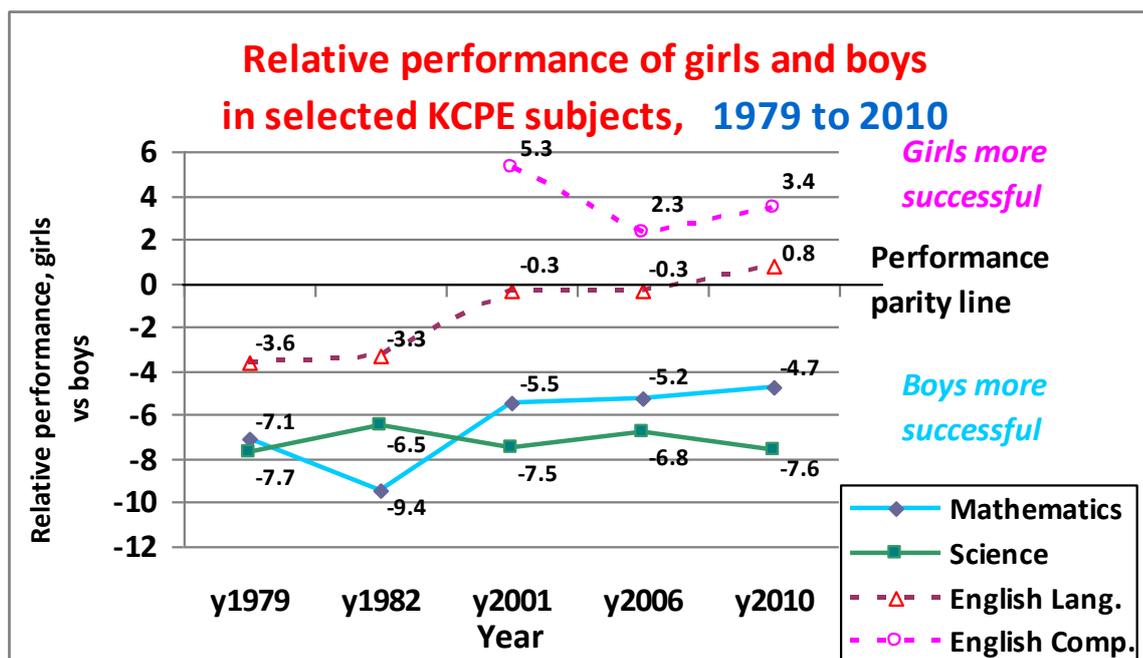
### 3.9 Girls’ KCPE Performance in Specific Subjects.

Although girls lag some distance behind boys in their overall KCPE performance, their disadvantage does not extend to all subject areas. Figure 17 shows the relative performance of boys and girls in three key subjects – mathematics, science and English - over the three decades between 1979 and 2010.<sup>22</sup>

<sup>21</sup> It is interesting to note that at each specific age, girls perform roughly at par with boys one year older.

<sup>22</sup> An earlier, less-detailed, analysis of these trends, based on data from two years only, has been published elsewhere (Somerset 2009)

**Figure 17: Relative Performance of Boys and Girls in Selected Subjects, 1979 - 2010**



The data come from various issues of the KCPE Newsletter, an annual publication of the Kenya National Examinations Council. First produced in 1978, the Newsletter identifies key areas where candidates' responses indicate weak conceptual understanding or cognitive skill, and offers suggestions to teachers as to how these weaknesses might be remedied. Gender-specific performance data were first included in 1979 and 1982; then, after a 20-year gap, they became a regular feature from 2001 onwards.<sup>23</sup>

Mathematics and science are examined entirely through questions in multiple-choice format: candidates are not required to construct their own answers, but simply to choose from among four alternatives supplied by the question-setters. In consequence, chance guessing can contribute substantially to the scores, especially among the weaker candidates.

For English, two different papers are set: a language paper, also in multiple-choice format; and a composition paper, which of course requires a constructed response, in the form of a passage of continuous prose. Since the late 1970s, the stimulus material for the composition paper has been designed to encourage imaginative writing. Very often, the opening sentences of a short story are provided, which candidates are asked to complete, making the story as interesting as they can. Alternatively, a cartoon sequence is sometimes used as stimulus material. In assessing the compositions, credit is given for both convergent skills (accurate grammar and syntax, correct spelling, legible handwriting) and divergent skills (fluency of narrative, imaginative ideas).

It will be seen from Figure 17 that in 1979, girls were considerably less successful than boys in all three subjects, although the achievement gap in the English language paper (-3.6 percentage points) was only about half as large as it was in mathematics (-7.1 points) and science (-7.7 points). Over the next three decades girls' relative performance in English language improved: by 2001 they were close to achieving parity with the boys (-0.3 points); and by 2010 were at a slight comparative advantage (+0.8 points).

<sup>23</sup> Raw marks, rather than standard scores, are used to compare girls' and boys' performance in the Newsletters. The trends shown in Figure 9 are based on these marks, expressed in percentage terms. The KCPE total scores discussed previously are based, it will be recalled, on standard scores summed over five subject areas.

However it is in the English composition paper that girls have been most successful. In 2001, the first year for which results are available, they out-performed the boys by as much as 5.3 percentage points. Since then the gap has been smaller but consistent - typically in the region of two to three points. It would be of much interest to know whether it is the convergent aspects of performance (accuracy, legibility), or the divergent aspects (narrative flow, imagination), which contribute most to the girls' comparative advantage.<sup>24</sup>

In mathematics, girls have always lagged behind the boys, but their relative achievement has improved since 1982, when the disparity in favour of the boys was a massive 9.4 percentage points. By 2001 the disparity had narrowed to 5.5 points, and then further to 4.7 points by 2010 – exactly half the 1982 level.

But in science, by contrast, there has been no progress. In 1979 the gap amounted to 7.7 points; in 2010, three decades later, it stood virtually unchanged at 7.6 points – wider than the gap for mathematics in the same year by nearly three points.

Concerned at the size of the 1979 disparity, members of the team responsible at the time for setting the science questions carried out an item-level analysis of gender differences in performance. They followed up with a series of science lesson observations, from which it became apparent that during the practical sessions in particular, boys tended to take the active roles, while girls were often passive onlookers.

The 1980 Newsletter communicated the results back to the schools:

In analysing the science questions in the 1979 (examination), an interesting fact was discovered about differences in performance between boys and girls. As you may remember from page 26 of this Newsletter, the performance gap was wider in science than in any other subject. In English, the average gap was only 3.6%; in mathematics, it was 7.1%; but in science it was as high as 7.7%.

When the science questions were analysed separately, however, it was found that girls performed quite well in most of the reasoning questions (relative to boys) . . . . . By contrast, girls tended to do badly in most of the questions which gave an advantage to pupils who had carried out practical observations and experiments . . . . The results were as follows:

<u>Questions testing:</u>	<u>Average mark</u>		<u>Performance gap</u>
	<u>Boys</u>	<u>Girls</u>	
Mainly reasoning	46.4%	42.0%	4.4%
Mainly observation or experiment	56.5%	42.4%	14.1%

As you can see, the average performance gap in questions which tested mainly reasoning was only 4.4%, which is only a little higher than the gap for English. By contrast, in the

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<sup>24</sup> Results for Kiswahili, the other KCPE language subject, are available for 2010 only; however in that year the achievement patterns were almost identical to those for English. Girls were more successful than boys in the Kiswahili language paper, but by a marginal 0.3 percentage points only; whereas in the composition paper their comparative advantage amounted to as much as 4.5 points. The Kiswahili composition marking scheme - like its English counterpart – gives credit for both the convergent and the divergent skills.

questions which tested mainly the results of observations or experiments the gap was as high as 14.1%.<sup>25</sup>

These results suggest strongly that the main reason why boys perform better in science than girls is not that they have superior reasoning ability, but rather that they have had more experience in carrying out observations and experiments.

The sequence concluded with remedial advice for the teachers:

Make sure that when you are doing practical work in science, the girls take just as active a part . . . as the boys. If you find that girls tend to be passive while working with boys, you may find it useful from time to time to arrange your groups so that boys and girls work separately

The persistence of the gender gap in science achievement indicates that the problems highlighted 30 years ago have yet to be effectively tackled. Renewed enquiry, both into the item-level performance patterns and into science pedagogy in the classroom, could well provide the understanding needed to inform the desired change – and also, perhaps, help generate the impetus needed to bring it about.

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<sup>25</sup> The full text, which runs to several pages, gives examples of each type of question. The reasoning questions, 13 in number, are defined as questions in which ‘candidates are given some information at the beginning of the question. They must analyse this information, and use it to draw a valid conclusion. . . . Candidates are not expected to have memorised these facts before the examination, nor even to have seen them before.’ The 11 observation questions, by contrast, are knowledge-based: ‘It is, of course, possible to learn the answers to these questions from textbooks, but those who have actually carried out the observations and experiments find the questions much easier.’

## **4. Concluding Remarks and Policy Implications**

This Research Monograph set out to explore patterns of participation across a number of Anglophone African countries to establish how participation had been changing over time, and to explore in more detail age, gender, location and performance in one case study country – Kenya. The analysis has highlighted how enrolment growth has occurred in very uneven ways across countries, and how increases in overall participation have not always been accompanied by decreased drop out. It also shows many aspects of how age, gender, location and performance interact and how inequalities in access persist. In conclusion we will summarise findings from the research and identify policy relevant conclusions. First we consider insights from the Kenya case study, and second from the analysis across eight countries.

Our analysis of data from the KCPE examination archives has centred around two major sets of issues. These are the **age** at which candidates sit the examination, its relationship to their performance, and its consequences for their future prospects; and the **gender** disparities in KCPE participation and performance.

### **4.1 Age, Participation and Performance in Kenya**

(a) A child who enters primary school at the expected age of six or seven years, and completes the eight-year cycle without interruption, should sit the terminating KCPE examination at the age of 13 or 14.

(b) But in fact there is massive variation in candidates' ages. In 2010, only 40% were aged 13 or 14; 41% were 15 or 16, while as many as 19% were between 17 and 20 – three or more years older than the most appropriate age.

(c) Furthermore there is a strong and consistent association between age and KCPE performance: each one-year increase in age is typically associated with a 10 to 15 point drop in mean total KCPE score.

(d) The causal linkages leading to this association are far from clear. Three types of experience, singly or in combination, can lead to a candidate being over-age: **late entry** to school; **repetition** of one or more grades; or **dropout and subsequent return** to school. From the available data it is not possible to determine which type of experience contributes most to underperformance.

(e) Although officially discouraged, repetition is still common practice in many primary schools. Teachers use repetition as a substitute for remediation: instead of providing slow learners with remedial help, they require them to repeat the whole year. In effect, they attempt to reduce cognitive heterogeneity by increasing age heterogeneity.

(f) Whatever the reasons for the association between age and KCPE performance, its consequences for access to secondary and post-secondary opportunities are plain. Kenya's secondary schools are formally stratified into a three-tier hierarchy: the prestigious national schools; the middle-ranking provincial schools, and the lower-status district schools. Exceptional KCPE results are required for access to the national schools; whereas many of the district schools are virtually non-selective.

(g) Because KCPE performance is so strongly associated with age, access to the highly-selective upper-tier secondary schools is heavily monopolised by the younger pupils. A 13-year-old KCPE candidate is about five times as likely to achieve the score needed for a national-school place as a

15-year-old; twelve times as likely as a 16-year-old; and no less than 50 times as likely as a pupil aged between 17 and 20.

(h) The advantages leading to superior KCPE performance are, in turn, multiplied by the superior quality of the education provided in the upper-tier secondary schools. Access to an upper-tier school has massive consequences for pupils' subsequent life chances. A graduate from a national school is over 100 times more likely to win a maintained place at a public university than a district-school graduate.

(i) For the purposes of our analysis, pupils aged between 17 and 20 years are categorised as 'over-age'. Applying this criterion, just under 19% of the 740,000 candidates who sat the KCPE examination in 2010 were over-aged.

(j) Around this national figure, however, there are wide local variations. Among the 47 new counties which will become the key units of local government with the implementation of the new National Constitution in 2012, the range in the proportion of over-age candidates was from as high as 50.0% to as low as 4.7%.

(k) Moreover, clear-cut geographical patterns were evident. Counties with above-average proportions of over-age pupils were, with few exceptions, located in two widely-separated 'over-age clusters'; the first centred on the coastal counties of Kilifi and Kwale in the east; the second, in the far west, on a group of counties adjacent to the Uganda border and the shores of Lake Victoria. Between the two clusters lies a continuous belt, running roughly north and south, made up of nearly all the counties where the proportion of over-age pupils is below the national average.

(l) However from the evidence available at present, it is not possible to identify possible causal factors which might help explain these patterns. Socioeconomic development does not appear to have any direct effect: the counties with the fewest over-age pupils include a number located in arid, drought-prone areas, together with others in high-potential, well-developed parts of the country. Local-level enquiry, employing qualitative as well as quantitative approaches, could doubtless yield useful insights, and perhaps lead to a meaningful interpretation of the patterns.

The implications for policy on age-in-grade in Kenya include:

- (i) A major policy priority should become strengthening the quality of education received by those who enter the district schools now that substantial progress towards wider secondary-school access has been achieved.
- (ii) Repetition should be reduced by devoting more attention to developing teachers' skills in providing remedial instruction for slow-learning pupils through improved primary teacher education programmes, both pre-service and in-service.
- (iii) Educational managers should mount campaigns explaining to parents the advantages of enrolling their children for primary education at the appropriate age (6 or 7 years) in the counties with above-average proportions of over-age pupils.

## **4.2 Gender, Participation and Performance in Kenya**

(a) At the national level, girls now sit the KCPE examination in near-equal numbers with boys. In 2010 the Gender Parity Index (GPI: the proportion of girls per 100 boys) stood at 92.

- (b) However within this overall picture, variation among the counties is massive. In as many as 12 of the 47 counties, gender parity had already been achieved by 2010: the GPI stood at 100 or higher. However in sharp contrast, the index was below 60 in four counties, and between 60 and 70 in a further three.
- (c) As with the over-age patterns, there was a strong geographical dimension to the gender differences. Virtually without exception, the counties where gender parity has already been achieved or is close to achievement (GPI 90 or above) fall within a crescent-shaped zone, spanning the country from Bungoma and Trans Nzioa on the Uganda border to Taita-Taveta on the Tanzania border in the south-east. However this zone, where girls are most likely to participate in the KCPE, does *not* correspond to the zone, previously discussed, where over-age candidates are fewest.
- (d) The gender-parity patterns yield to interpretation more readily than the over-age patterns. In general it is in the drought-prone arid and semi-arid areas, where land potential is low and household incomes largely dependent on the livestock economy, that gender disparities in KCPE participation are at their widest.
- (e) However there are various parts of the country which do not conform to this general trend. Inland from the coast, two adjacent counties classified as semi-arid have nevertheless achieved gender parity; while in the south-west, a cluster of non-arid counties have GPIs well below the national mean.
- (f) So it is clear that although land-resource levels have a substantial impact on girls' KCPE participation, other factors – social, cultural, perhaps historical – are also involved. Again, local-level enquiry could lead to better understanding of these factors, how they produce their effects, and what measures might lead to change.
- (g) In terms of their KCPE scores, girls lag some distance behind the boys. Nevertheless, the performance gap has narrowed considerably in recent years.
- (h) An analysis of gender differences in mathematics, science and English achievement carried out in 1980 on the 1979 data indicated that girls were at a disadvantage in all three subjects, although the gender gap was twice as wide in science and mathematics as it was in English.
- (i) Since 1979, girls' relative achievement in English has improved steadily: by 2010 they enjoyed a clear advantage over the boys, especially in the English Composition paper. In mathematics, too, there has been some movement towards performance parity. But in science, there has been no progress: the performance gap was as wide in 2010 as it had been in 1979.
- (j) In a detailed item-level analysis carried out after the 1979 examination, it was found that girls performed relatively well in data-based science reasoning items, which could be answered through analysis of new information provided in the stem of the question. By contrast, they lagged well behind the boys in knowledge-based questions which advantaged pupils who had carried out a practical observation or experiment.
- (k) Observations of science lessons during school visits provided supporting evidence. In practical sessions especially, boys were likely to be taking active roles, while girls tended to be passive onlookers.
- (l) The persistence of the gender gap in science achievement first identified 30 years ago indicates that the issues highlighted at that time have yet to be effectively tackled.

The implications for policy to reduce gender gaps in performance in Kenya include:

- (i) In the counties where girls complete the primary cycle and participate in the KCPE examination in much smaller numbers than boys educational managers should initiate local enquiries into the reasons for the disparities as a basis for devising appropriate local remedies
- (ii) An observational study of current primary science teaching practice should be mounted as a step towards understanding the reasons for the persistent gender disparities in science achievement.
- (iii) The development of teachers' skills in managing practical activities in ways which ensure that learning opportunities are maximised, and that boys and girls benefit equally, should be a priority, especially in science education programmes.

### **4.3 The Evolution of Patterns of Participation across Countries**

The patterns in the data show some of the challenges that remain for improved participation. In seven of the eight countries examined the numbers enrolled in the early grades are greater than the numbers in the six year old population indicating that there is over-age enrolment (and possibly some underage enrolment) and that repetition is still a serious issue. The tipping point where enrolments in a grade exceed the size of the population in the age group varies from Grade 2 to Grade 6 indicating that there are different pathways to travel to provide enough capacity for universal enrolment. It is clear from the enrolment curves that though Gross Enrolment Rates may be over 100% many do not complete the basic education cycle successfully. In some cases expansion has dramatically increased enrolments in lower grades without concomitant increases in higher grades and completion rates. Those who enter grade one did not always arrive in the last grade of primary six or seven years later.

Across the data sets on average girls are enrolled less than boys in most of the countries but the differences are relatively small and have been diminishing. Noticeably these differences are smallest in the lower grades and begin to grow above Grade 6 in the lower enrolment countries. It is clear that higher overall enrolment rates at primary and secondary are associated with greater gender equity. It is also the case girls tend to enrol younger than boys and boys persist longer in school than girls in some of the countries, including Kenya. The Kenya case study provides a reminder that although overall participation is becoming more gender equitable, within countries there may be considerable variation between districts. National averages conceal disparities that can be extreme at local levels.

We can note that all the low enrolment countries have large age-in-grade disparities. These increase with grade level and are likely to generate difficult conditions for learning and teaching in classes with a wide range of children's ages and capabilities. The Kenya case study, and other data, indicates clearly that achievement and attainment are age related, with older candidates scoring lower, and being more likely to leave school prematurely. Urban children are more likely to be enrolled to high grades in all the countries considered. However patterns vary with the gaps between urban and rural enrolment rates growing faster with higher grade level in some countries rather than others (Lewin and Sabates 2011).

The case study in Kenya mirrors some of these results from the cross national data sets. It uses robust data on the large population of children taking the KCPE. These candidates are already a selected group in the sense that those with the lowest achievement and those who are most over-age are unlikely to reach Grade 8 and take the KCPE. The analysis confirms that in Kenya age is strongly associated with performance. There is a linear decline in average scores related to age.

Boys score higher than girls on average, though girls tend to take KCPE at younger ages than boys. There are no simple patterns that relate participation and performance to location and age. There is considerable variation in patterns between counties in Kenya. More research is needed to establish if the patterns observed in Kenya are common in other countries in Sub Saharan Africa.

The policy implications of the analyses in this monograph include several which are specific to Kenya and which are listed in the previous section. More generally several issues and related possible actions stand out:

First, patterns of enrolment by grade should be reviewed annually and explored in terms of changing participation by grade, attrition from grade to grade, and estimated completion rates. The patterns for boys and girls should be considered separately to establish differences in participation rates, their recent evolution, and the likely causes and effective mitigation strategies.

Second, focussed attention should be given to the problems related to over-age children. These should address both late entry and repetition, and should seek to minimise both. Since the consequences of being over-age appear to be closely correlated with primary school leaving examination performance, and thus subsequent access to secondary schooling, it is essential that age grade slippage is reduced.

Third public awareness campaigns are therefore needed to sensitise parents to the importance of enrolment on schedule at age six years, and teachers to the costs of repetition in terms of delayed progression and likely drop out. Though this will not guarantee reduced drop out and greater completion rates it is almost certain that without less variation in age within grades universal completion will remain elusive.

Fourth, steps are needed to establish to what extent repetition of grades serves a purpose and whether as a result there is any evidence of improved learning and subsequent progression. Repetition determined by school level decisions may not be based on a secure evidence base, may increase the chances of subsequent drop out if it increases the numbers seriously over-age, and may be inequitable if different schools and teachers apply different standards.

Fifth, indicators are needed which highlight regional and district variations in participation and achievement which are linked to programmes designed to reduce inequalities associated with poverty, gender, and location. Annual reviews should identify where differences are greatest and where they have been growing in order to intervene and monitor closely efforts to ameliorate the causes of educational exclusion.

If the existing disparities - between richer and poorer children, between boys and girls, and between urban and rural children - are to diminish then the dynamics that shape the disparities and determine how changes can be brought about need to be better understood in each country and county context. This requires a new focus on equity as a goal which complements increased participation, and further exploration of the correlates of exclusion, with sustained efforts to address the disadvantages and vulnerabilities that continue to exclude too many children from learning that can transform their well being.

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## **Annex 1: KCPE 2010: Age and gender statistics by county**

- (a) Proportion of over-age candidates (17 to 20 years)  
 (b) Girls' participation (Gender Parity Index: Girls per 100 boys)  
 (c) Girls' performance (Gap in mean total score between boys and girls)

County	Candidates	KCPE & Age	KCPE & Gender	
		% Over-age (17 to 20 years)	Girls' participation. (GPI: Girls per 100 boys)	Girls' performance. (Gender gap, mean total score)
<b>Coast:</b>				
Taita-Tav	7,355	29.8	101	10.17
Kwale	12,715	50.0	72	19.00
Mombasa	14,554	24.5	93	8.11
Kilifi	24,203	45.6	75	16.08
Tana River	2,424	19.1	58	23.71
Lamu	1,732	34.9	77	6.68
<b>North East:</b>				
Garissa	4,939	23.4	40	7.31
Wajir	2,329	8.2	40	5.44
Mandera	3,652	15.8	39	16.12
<b>East:</b>				
Machakos	23,315	22.0	99	8.94
Makueni	24,537	11.5	101	8.44
Kitui	27,181	26.7	99	13.21
Embu	9,909	19.9	108	7.22
Tharaka-Nthi	7,918	18.7	101	5.10
Meru	27,449	23.7	111	8.58
Marsabit	3,101	9.1	64	23.85
Isiolo	1,925	13.6	68	17.57
<b>Central:</b>				
Kiambu	34,202	8.0	102	5.33
Muranga	19,955	13.0	104	10.53
Nyeri	18,432	10.6	102	1.90
Kirinyaga	10,705	14.0	98	8.73
Nyandarua	16,097	12.9	104	11.35
<b>Nairobi City</b>	41,433	8.4	103	5.71

(Continued)

## Annex 1 (continued)

County	Candidates	KCPE & Age		KCPE & Gender	
		% Over-age (17 to 20 years)	Girls' participation. (GPI: Girls per 100 boys)	Girls' performance. (Gender gap, mean total score)	
<b>Rift Valley:</b>					
Turkana	4,462	21.7	54	12.88	
Samburu	2,413	11.8	59	25.01	
Trans Nzioa	16,318	22.6	101	13.85	
West Pokot	3,333	22.7	71	11.72	
Bomet	18,210	5.4	88	16.53	
Uasin Gishu	17,228	15.8	100	8.07	
Nakuru	35,875	14.9	97	13.24	
Kericho	18,411	8.3	94	13.36	
Nandi	15,049	22.9	96	9.66	
Laikipia	8,743	17.9	95	8.75	
Kajiado	9,828	19.9	83	6.46	
Narok	11,503	8.7	65	17.18	
Baringo	12,530	4.7	93	13.24	
Elgeo-Marakwet	10,313	11.1	99	4.99	
<b>Nyanza:</b>					
Siaya	18,059	25.7	87	14.48	
Kisumu	19,339	17.2	88	12.18	
Homa Bay	20,866	11.6	72	16.78	
Migori	16,671	12.9	69	15.83	
Nyamira	12,842	7.4	98	12.35	
Kisii	22,069	8.5	93	13.90	
<b>West:</b>					
Bungoma	31,309	22.9	95	11.54	
Busia	13,919	30.0	85	15.62	
Kakamega	34,431	30.9	100	11.80	
Vihiga	12,868	29.9	110	14.63	
<b>National</b>		<b>18.7</b>	<b>92</b>		



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Educational Access, Transitions & Equity  
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### Report summary:

This paper explores aspects of exclusion from education and how patterns of participation have been changing using national data sets from eight countries. The first part of the analysis charts enrolments by grade over the last decade and explores how enrolment has been changing in terms of grade, gender, and age. A detailed case study of changes in participation and performance is developed using data from the Kenya National Examinations Council. The study shows that the aspirations of Education for All remain far from being met in many countries and many of those who enrol in Grade 1 fail to complete primary or lower secondary school. Progress has been patchy and it remains the case that less than half the age group progressing through lower secondary school. Gender equity is within grasp in the eight countries. However, in all the countries many of those enrolled remain seriously over-age, and urban rural differences persist. These patterns are mirrored in Kenya where there has been uneven growth in participation and where older children score on average much lower on the KPCE than younger children. This is a source of considerable inequity since over-age status is associated with poverty.

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