

**WHO GETS PRIMARY SCHOOLING AND WHY?
EVIDENCE OF GENDER INEQUALITIES WITHIN
FAMILIES IN GUINEA***

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SUMMARY

This paper examines family-level determinants of schooling for boys and girls in Guinea using bivariate and multivariate analyses on data collected from school surveys. The results indicate that parents' education and household wealth are two important determinants of school attendance and completion, particularly for girls. Mothers' formal education is found to be a significant determinant of girls' school attendance, increasing the probability of attendance by 18 per cent. In contrast, fathers' formal education has no significant effect on children's schooling. Non-formal education appears to have a different impact on the chances of currently being in school for boys and girls. Mothers' non-formal education increases the chances of boys attending school and decreases those of girls, whereas fathers' non-formal education reduces the chances of both boys and girls attending primary school.

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1 INTRODUCTION

The majority of school aged children in Guinea face tremendous difficulties in either entering or completing school at the primary level. This situation is worst for children in rural and remote parts of the country and particularly for girls in these areas. The consequences of low school enrolment and persistence rates to development are clear and far-reaching. Low levels of schooling retard economic growth, limit human development and impede the reduction of rapid rates of population growth (Becker 1995, World Bank 1995a).

The literature on school participation in developing countries and especially in Sub-Saharan Africa holds that a number of demand and supply factors are responsible for low enrolments. Specifically on the supply side, insufficient number of schools, a limited number of places in existing schools and shortage of teachers have persistently been mentioned. On the demand side, the high direct and indirect costs of schooling are paramount (Odaga and Heneveld, 1995). This paper examines household and individual characteristics that affect primary school attendance and explores the causes of gender inequalities in schooling opportunities by looking at enrolment patterns and family characteristics of primary pupils. The paper is based on data collected from school aged children (pupils enrolled in primary six (the last grade of primary), pupils who have dropped out of school and children who have never enrolled) in Lelouma (Middle Guinea) and Yomou (Forest Guinea) in 1995/96. The data set includes information on demographic, social and economic characteristics of the children's households.

The paper provides in section two some background of Guinea including an overview of the current status of primary education. This is followed by a review of the literature on the determinants of schooling in section three. Evidence is drawn mainly from the gender and schooling literature in Sub-Saharan African countries and from earlier studies in Guinea wherever possible. Section four contains information on the data set used in this analysis. The main findings which highlight results from bivariate and multivariate analysis of family-level determinants of schooling are presented in the fifth section. The concluding remarks are presented in the final section.

2 COUNTRY BACKGROUND AND RECENT DEVELOPMENTS IN PRIMARY EDUCATION

The Republic of Guinea is situated on the coast of West Africa with a population estimated at 6.2 million in 1993. Population growth is estimated to be three per cent per year and a large proportion of the population, 47 per cent, is below the age of 15. The country is rich in minerals, holding substantial reserves of bauxite, diamonds, gold, iron and other minerals. It also has excellent agricultural potential ensured by adequate rainfall, fertile valleys and coastal plains. In spite of its natural wealth, Guinea is classified amongst the poorest countries in the World. In 1993, its GDP per capita was \$520. According to the 1996 United Nations Human Development Report, Guinea ranks amongst the lowest twenty countries in the world and its human development indicators compare unfavourably with averages for Sub-Saharan Africa, and the World's least developed countries (see Table 1) (UNDP, 1996).

Table 1: Socio-economic indicators of Guinea, 1993

	GDP per capita (US\$)	Life Expectancy	Infant Mortality Rate	Adult literacy rate (%)		Percentage of the Population with Access to Drinking Water, Health Facilities, Sanitation Facilities		
				Male	Female			
Guinea	520	45	133	48	20	55	80	21
SSA	555	51	110	65	45	45	57	37
LDC	210	51	70	58	36	52	50	31

About 87 per cent of the population are Moslems and the rest are either Christians or Animists in roughly equal proportions. Although French is the main working language, there are five local languages; Guerzé, Malinké, Manon, Peulh and Sousou. There are about twenty ethnic groups practising a range of agricultural and agro-pastoral forms of production (World Bank 1995b).

Like many other countries in Sub-Saharan Africa, the Republic of Guinea is still far from attaining universal primary education (UPE). However in recent years, primary enrolment ratios have shown great improvements increasing from 28 percent in 1988/89 to 40 percent in 1993/94. The Education Sector Investment Programme (ESIP), funded by a group of aid agencies, introduced a series of reforms aimed at increasing access to primary schools in 1990. Within the first three years of ESIP, the total number of primary classrooms increased by 50 percent, the total number of primary teachers increased by 34 percent and the number of pupils enrolled in Guinea increased by 63 percent (Kamano, 1995).¹ These substantial improvements were largely due to increases in education sector resources. The share of the national recurrent budget allocated to education increased from 14 per cent to 26 per cent and the proportion of the education budget allocated to the primary level also rose from 15 per cent to 36 per cent within the same period. Notwithstanding these remarkable achievements, more than 50 percent of the school-aged population is out of school. Enrolment ratios differ greatly between regions and also between urban and rural areas. In 1993/94, Middle Guinea, a mainly rural area, had a GER of 29 per cent compared to Conakry, a mainly urban area, which had a GER of 75 per cent.

Quality of schooling at the primary level is poor (Martin and Ta Ngoc Chau, 1993). Cohort analysis indicates that less than 70 percent of pupils who enrol in grade one complete the primary cycle within the usual eight years (Tembon et al, 1997). Input indicators for 1993/94 reveal that there are on average ten pupils per textbook and about 20 percent of classrooms are classified as being in bad condition (MEPU-FP, 1994). Both factors largely explain the high repetition and drop out rates, which characterise primary schooling in Guinea (Tembon et al, 1997). Furthermore, there is a large gender gap in primary enrolment rates with one girl enrolled for every three boys in 1993/94. Girls' dropout and repetition rates are also much higher than those of boys.

A number of studies have been undertaken in Guinea to investigate the causes of low and differential enrolment, persistence and performance that characterises primary education in Guinea. Camara (1990) compared enrolments by gender at all levels of the education system, in public and private schools, rural and

urban schools, French medium and Arabic medium schools. He observed that the proportion of girls was higher in Arabic or Franco-Arabic primary schools compared to French medium primary schools. Following this analysis, three other studies were conducted to identify the factors that influence girls' access to primary schools in rural areas of Guinea (Long, 1990; Kourouma, 1991 and Sow, 1994). Results from these studies reveal that the main constraints to girls schooling are:

On the demand side:

1. high direct costs of schooling,
2. the pressure of domestic work on girls and their involvement in income generating activities for the family,
3. negative parental attitudes towards girls' schooling,
4. early marriage practices.

On the supply side:

1. long distances between home and school,
2. insufficient number of schools or school places and,
3. inadequate facilities in rural schools.

The main conclusions and policy recommendations from the studies were rather different. While Kourouma (1991) concluded that negative parental attitudes towards girls' education, and hence lower female participation, was due to illiteracy and religion, Sow (1994) concluded that poverty was the main cause. However, an education sector review paper on girls' access to schooling in Guinea concluded that supply factors were more important than poverty, in explaining the low enrolment of girls (World Bank, 1995b). From the above findings, it is clear that schools must be available and families must also be willing to enrol their children.

Although the ESIP program resulted in an increase in the supply of school places as well as an increase in enrolments, the wide gender gap in enrolments at the primary level has persisted. Furthermore, recent enrolment trends reveal that the gender gap is widening. This implies that demand factors at the family level appear to be more important in explaining gender inequalities in primary school enrolments than supply factors. Therefore an in-depth understanding of the determinants of primary school attendance and completion for boys and girls will be crucial to the formulation of appropriate policies so that UPE is achievable.

3 A REVIEW OF FAMILY² LEVEL DETERMINANTS OF SCHOOLING

School enrolment choices have been found to be influenced by several factors that can be categorised into four main groups: (a) household characteristics (e.g. income, size and composition, educational level of parents); (b) individual characteristics (e.g. age, gender, and relation with household head); (c) school characteristics (e.g. fees, distance between home and school, availability of teaching and learning materials and teachers); and (d) urban and rural area characteristics (e.g. presence of pipe borne water, electricity,

labour market participation rates and expected earnings) (Glewwe and Jacoby, 1994; Odaga and Heneveld, 1995; Bredie and Beeharry, 1998).

This section reviews the literature on individual and family level characteristics that explain differences in schooling opportunities by gender. The review is limited to the impact of family characteristics on educational participation because in Guinea there are no compulsory schooling laws and the decision to enrol a child in school lies ultimately with the child's parents or family. School characteristics have also been found to influence schooling decisions, but these factors will not be part of this review.

The literature on household or family level determinants of schooling in Sub-Saharan Africa has grown remarkably in the last decade (Appleton et al, 1990; Montgomery, Kouamé and Oliver, 1995; Mason and Khandker, 1996; Lloyd and Blanc, 1996; Tansel, 1997; Rose and Al-Samarrai, 1997 and Al-Samarrai and Peasgood, 1998). The theoretical framework on which most of the analyses in these studies are based proposes that families decide to enrol their children in school because they consider schooling to be an investment that will pay dividends both to the child and to the parents themselves in the future. The decision is made to enrol the child, when the family is convinced that the net future benefits of schooling are in excess of present costs. Future benefits are often perceived in terms of prospects in securing employment in the labour market, earning a high income and remitting some of the income he/she makes back to the family. The costs of education may be direct and indirect. Direct costs include money outlays for fees, books, uniforms, and transport. Indirect or opportunity costs include the loss of the child's labour to the family while he/she is at school. Even when parents are convinced of the benefits of schooling, they still may not be able to enrol their children in school, if they are resource constrained. Therefore for a child to be enrolled his/her parents must have the financial ability to meet the costs of schooling and must also see the pecuniary and non-pecuniary benefits of schooling.

A review of studies that have attempted to explain gender differences in educational opportunities in Sub-Saharan Africa, indicates that there is male preference in the demand for education (Odaga and Heneveld, 1995). This is because parents often perceive the benefits of boys' schooling to be greater than the benefits of girls' schooling. There are two main explanations for this perception. First, there tends to be more formal labour market opportunities for boys than girls, particularly in rural areas. Secondly, in patriarchal systems that are common in many African countries, sons inherit the family's wealth and carry on the family name whereas daughters do not. It is widely believed that when girls get married it is their husbands' family that captures any return to schooling. Consequently, in some families, expenditures made towards the education of sons is considered to be a worthwhile investment, whereas expenditures made towards a daughter's education are considered to have very low returns. As a result of such perceptions, some parents choose to enrol their sons rather than daughters in school, especially when the family faces financial difficulties.

One of the findings that emerges from almost all empirical studies on family level determinants of schooling reviewed in this section, is that household per capita income or wealth is positively associated with greater demand for education or educational attainment. Children from rich households or families are more likely to be enrolled and complete school because the costs of schooling can be covered by available

income. Children from poor families are less likely to enrol and complete school because even if their families recognise the benefits of schooling and decide to enrol them, they will be unable to finance the costs of schooling (Appleton *et al* 1990). Family income or wealth is therefore a key variable that explains differences in educational opportunities and attainment between families.

Another family characteristic that greatly influences schooling decisions is the level of parents' education. In Tanzania, Mason and Khandker (1996) found that parents' educational levels had a positive and significant impact on the chances of a child enrolling in school. In the same study, the level of mothers' education had a particularly strong influence on the probability of girls enrolling in school. Similar results have been found in other studies in Tanzania, Ethiopia and elsewhere (Al-Samarrai and Peasgood 1998; Rose and Al-Samarrai 1997; King and Hill, 1993). The level of mothers' education has also been found to influence the number of years a child stays in school. In Ghana, Montgomery, Kouamé and Oliver (1995) found that children of mothers with secondary education are predicted to complete on average nine years of schooling in rural Ghana whereas children whose mothers have no schooling are predicted to complete only five years of schooling. In general these studies have found that girls' chances of attending school are much more sensitive to parents' education than boys'.

The size and composition of the family unit has also been found to influence the likelihood of enrolment and attendance at school. The number of children in a household or the number of siblings a child has may affect his/her chances of enrolment and attendance at school. For example, when there are many children in a family, limited family resources and the relatively high costs of schooling may cause parents to send only some of their children to school (Lloyd and Gage-Brandon, 1994). However, sibling and extended family support networks as well as child fostering practices that are very common in many African countries have also been found to counter the effects of limited family resources on the schooling of a large number of children in a family (Ainsworth, 1992; Montgomery, Kouamé and Oliver, 1995 and Lloyd and Blanc, 1996). The literature also indicates that, family schooling decisions are related to birth-order (Odaga and Heneveld, 1995). The oldest child in the family always has the advantage to attend school in the early grades because he/she faces no competition for family resources. However when the number of children in the family increases and resources remain limited, the children for whom the costs of schooling are lowest (i.e. the youngest) and those for whom perceived future benefits are expected to be higher (i.e. boys) are more likely to be favoured. Furthermore, the education of older children may be shortened so that they can start working in order to finance the education of younger siblings.

A child's chances of attending school are also influenced by the number of adults in the household and the labour needs of the family. The more adults there are in a household, the higher the chances of school enrolment because the adults will be able to take care of the family's labour needs, thus liberating the children to attend school. Schooling often conflicts with the demand on children's time and hence limits participation in education. In a study on child labour and schooling in Ghana, Carnagarajah and Coulombe (1997) found that girls are predominantly involved in domestic chores and childcare activities and the presence in a household of children less than the age of six, reduces the chances of girls attending school. Similarly, Chernichovsky (1985) found in rural Botswana that the age and gender of siblings have a strong

effect on school attendance patterns. Family demand for children's time is generally greater in rural areas reducing the probability of school enrolment when compared to urban areas.

The evidence reviewed in this section indicates that family determinants of schooling are complex and their effects vary from context to context. What effects do these family level factors have on primary schooling in Guinea? Which of the factors determine differential enrolment and persistence in school between males and females?

4 THE SETTING AND DATA COLLECTION

The data used in this analysis were collected during school surveys conducted in 1995, in two prefectures, Lelouma and Yomou, in Guinea, as part of the Gender and Primary Schooling in Africa Programme. The two prefectures found in Middle and Forest Guinea respectively, show salient differences in their educational, economic and social backgrounds. With a population of 109,417 inhabitants in 1994/95, Lelouma had 77 primary schools, five junior secondary schools and one upper secondary school. The main economic activity practised is animal husbandry and small scale trading. Peulh is the main ethnic group and almost everybody practises the Moslem religion. Yomou has a population of 74,417, 64 primary schools, seven junior secondary schools and two upper secondary schools. The main economic activity is cash crop farming of coffee, cocoa, rubber, palm and cola nuts. The population is made up of three main ethnic groups, the Kpele, Manon, and Malinke who practise either Christianity or Animism.

The prefectures were chosen using a two-stage procedure. First, the regions were chosen on the basis of their GERs relative to the national average and then the prefectures were chosen on the basis of their GERs relative to the regional average. Middle Guinea has the lowest gross enrolment ratio in Guinea and within it Lelouma has the lowest enrolment ratio. In contrast, Forest Guinea has the highest enrolment ratio (except for Conakry, which is a special zone,) and Yomou is the prefecture with the highest enrolment ratio. The relative gender gap³ in Lelouma is similar to the gender gap for the Middle Guinea region as a whole, which is much wider than the national average. The gender gap in Yomou is narrower than the regional average and similar to the national average (see Table 2).

Table 2: Gross enrolment ratios in sampled regions and prefectures

	Male GER	Female GER	Total GER	Relative Gender Gap
Middle Guinea region	41.9	17.3	29.4	41.2
Lelouma Prefectures	25.7	10.1	17.8	39.3
Forest Guinea region	64.7	25.2	44.6	38.9
Yomou Prefectures	87.2	39.9	63.1	45.8
National Average	55.1	25.7	40.1	46.6

Source: MEPU-FP, 1995.

A rural, semi-urban and urban school were chosen from each prefecture, making a total of six schools. Schools were also chosen on the basis of their male and female enrolment ratios (high, average or low)⁴. The

survey sample includes 234 grade six pupils, 60 pupils who had dropped out of school and 86 non-enrolees (Table 3).

Table 3: Sample by prefecture and by gender

	LELOUMA		YOMOU	
	Male	Female	Male	Female
Grade Six Pupils	91	38	75	30
Drop Outs	15	15	11	19
Non-enrolees	28	13	20	25

Data were collected by using structured questionnaires, administered on a one-to-one basis and completed by an enumerator. The data can be categorised under respondents' characteristics (gender, age, height and weight), parents' characteristics (educational level attained by mother and father), and household characteristics (number of other children in the household, number of adults and household possessions such as radio, television, refrigerator, bicycle, motorbike, car, source of lighting and type of roof). Furthermore, information was collected on the help that children offered their families in order to assess the potential demand for the child's labour by his/her family. Other information such as distance from home to school and the number of times a child has repeated grades in primary school were also collected. A full list of the variables used in the present analysis is shown in Table 4.

4.1 Data Analysis

Bivariate analysis

Bivariate analysis was carried out on the data collected. The analysis examines differences in characteristics between boys and girls within each of the surveys; and differences in characteristics between the three surveys for girls and boys separately. Tests have been carried out to see whether the differences in the proportions or means between groups of data are significant (i.e. between boys and girls within surveys and between surveys). Two tests are used. For categorical variables, the proportion in one group is tested against the proportion in the other group (for example, the proportion of male pupils living with both parents is compared with the proportion of female pupils living with both parents) to see whether the proportions are significantly different. For continuous variables (such as school starting age), a test of the difference in means is used to see whether there is a significant difference between the two groups.⁵ These tests are carried out separately for each region given the very different enrolment characteristics of the two survey areas. The tests of significance between boys and girls for each region are reported in Appendix 1, and the tests of significance between the surveys are reported in Appendix 2.

Table 4: List of variables used in the data analysis

Variable Name	Description
School Dummies⁶	
School 1	Reference category: if the child is from the School 1 area
School 2	1 if the child is from School 2 area
School 3	1 if the child is from School 3 area
School 4	1 if the child is from School 4 area
School 5	1 if the child is from School 5 area
School 6	1 if the child is from School 6 area
Education Dummies	
Father formal	1 if the child's father has some formal education
Father non-formal	1 if the child's father has some non-formal education
Mother formal	1 if the child's mother has some formal education
Mother non-formal	1 if the child's mother has some non-formal education
Guardian Dummies	
Living with one parent	Reference category: if child lives with both parents
Other Guardians	1 if the child lives with one parent only
	1 if the child does not live with their mother only or both parents
Other Variables	
BMI5	1 if the child is below the fifth percentile of the body mass index (BMI) (i.e. the child is under nourished)
Work for household	Composite index of the amount of work the child does for the household
Wealth index	Composite index of possessions of the child's household
No of children	Number of children in child's household
No of adults	Number of adults in child's household
Repeated	1 if the child has repeated one or more grades of primary school
Starting age	Age at which the child started primary school

Multivariate analysis

In addition to the bivariate analysis, three logistic regressions were run.⁷ The purpose of running these regressions was to examine the differential impact of household attributes on boys' and girls' chances of going to and completing primary school. Two different groupings were used to look at the probability of attending school. The dependent variable in the first regression compared pupils and dropouts (i.e. those who were either currently in school or who had attended school but dropped out) with non-enrolees. The second regression groups dropouts and non-enrolees together and compares pupils with those not currently in school. The final regression compares grade six pupils and dropouts looking at the difference in household characteristics between pupils and dropouts. This regression, reported in Table 19, refers to primary six pupils as completers since they are in the last grade of primary school.

For the regression analysis, the boys' and girls' samples were pooled.⁸ In order to assess the differential impact of household attributes on boys' and girls' education, a set of gender slope dummies (equal to one if the child is female, zero otherwise) were included on some of the coefficients. Initially gender slope dummies were included for most of the explanatory variables included in the regression analysis. Some of the gender slope dummies were subsequently dropped due to their insignificance and a more parsimonious model was estimated for each regression.

4.2 Limitations of the Data Set

Table five shows the number of children interviewed in each group by school and region and highlights some of the problems of using the data set for comparative analysis between pupils, dropouts and non-enrolees. The proportions of the data in each group shown in Table five are not equal across the schools or across the prefectures; and the relative sizes of the three samples in each school area are not representative of the proportions in these groups. For example, the gross enrolment ratio in primary school for Lelouma prefecture is 17.8 per cent (see Table 2). 58 per cent of the sample are currently attending school suggesting that pupils in the survey are over-sampled compared with dropouts and non-enrolees.⁹ This is not generally a problem for the bivariate analysis as it implies that the pupil proportions and means that are estimated from the sample would be more accurate compared to the dropout and non-enrollee estimates because the sample size of these two groups is small. It might, however, be a problem in the multivariate analysis, since the relative proportions of those going to school and completing school are not representative of the population as a whole.

Table 5: Size of sample by region, school and prefecture

School/Prefecture	Number of grade six pupils surveyed	Number of drop-outs surveyed	Number of non-enrolees surveyed
Forest Guinea			
School 1	50	10	15
School 2	30	10	12
School 3	49	10	14
Yomou total	129	30	41
Middle Guinea			
School 1	51	10	15
School 2	10	10	15
School 3	44	10	15
Lelouma total	105	30	45

For the multivariate analysis, the samples from the two prefectures are pooled. As mentioned previously, the two prefectures were chosen to represent very different characteristics and, therefore, the relationship

between household characteristics and the dependent variable may be different in the different zones. A likelihood ratio test of the pooling assumption confirms that the two regions should be analysed separately.

The problems outlined in this section highlight the difficulties in trying to collect information on a representative sample of children in one area where a recent and accurate sampling frame is not available. Schools, particularly in rural areas, serve a wide area and reaching children who do not go to school is difficult because households in which these children live are widely dispersed. Due to the problems mentioned in this section the multivariate analysis must be interpreted with caution. However, the bivariate analysis is generally supportive of the econometric analysis.

5 RESULTS

5.1 Results of the Bivariate Analysis

The results in this section are presented in two ways. Firstly, if the variable is continuous, the mean is reported for girls and boys by prefecture and by survey. The means for pupils and dropouts (i.e. those that have attended school), and dropouts and non-enrolees (i.e. those that are currently not attending school) are also reported. Secondly, if the variable is categorical, the proportion of the sample in each category is reported for girls and boys by prefecture and by survey¹⁰.

The most consistent factor influencing attendance and completion of schooling in Guinea that has been identified in earlier studies, has been the level of household wealth. Table six presents the mean of the household wealth index calculated from data on possessions owned by the household.¹¹ In both prefectures the mean wealth index of pupils is relatively high when compared to that of dropouts and never enrolled. Girls who are at school tend to be from wealthier households than boys and this is significant in both prefectures. The mean household wealth index of the households of girls who have never enrolled in Yomou is higher than the wealth index of boys who have never enrolled. In both prefectures, the mean index of children who have attended school (i.e. pupils and dropouts) is higher than the mean index of those who have never enrolled. In addition to this the wealth index of girls in school is much higher than for boys. This indicates that girls' attendance and completion of schooling is more sensitive to the level of economic wealth in the family than boys'. Therefore, in cases of limited financial resources in the family, boys stand a better chance of going to school than girls do.

Another indicator of socio-economic status is the health status of children. If a child is undernourished it suggests that the household commands insufficient resources to provide an adequate diet for all members of the family. It is unlikely, therefore, that the household will be able to afford to pay school expenses. In addition to this undernourished children will have smaller attention spans and will be ill more frequently impacting negatively on their participation at school and in some cases resulting in dropout. In order to compare the health status of children in the sample a body mass index by age (BMI5) has been calculated.¹²

Table 6: Mean household wealth index

	Yomou					Lelouma				
	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs
Mean Wealth Index										
Boys	3.5	3.4	2.2	3.5	2.6	4.3	3.7	3.4	4.2	3.5
Girls	4.7	2.9	3.3	4.2	3.1	5.6	4.2	3.0	5.1	3.5
Sample size										
Boys	91	15	28	106	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44

Table 7: Percentage of undernourished children in the sample using BMI index.

	Yomou					Lelouma				
	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs
% under-nourished										
Boys	80	80	89	80	86	51	91	55	56	68
Girls	90	100	92	93	96	83	100	88	90	93
Sample size										
Boys	91	15	28	106	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44

It is clear from Table seven that there is a marked difference in the health status between boys in Lelouma and the rest of the sample; a greater proportion of boys in Lelouma are well nourished compared to the rest of the sample. In Yomou, over 80 per cent of the children in the sample are undernourished irrespective of whether they have been to school or not. The differences between girls and boys in Yomou are only significant for the drop-out sample where all girls are undernourished. The very small differences seen in Table seven between the different samples for Yomou are not significant as would be expected. The situation is very different in Lelouma where boys are generally better nourished than girls whether they are in or out of school. In addition to this, pupils of either sex are significantly better nourished than drop-outs. The difference between the health status of children in Yomou and Lelouma maybe linked to the differences in the mean household wealth index. As shown in Table 6, regardless of gender and of whether children are in school or not, the wealth index of households in Lelouma is higher than the wealth index in Yomou. The significant difference in the BMI index between boys and girls in Lelouma, maybe due to gender inequalities

in the traditional systems of food distribution with men and boys receiving a greater share of good quality food compared to girls and women¹³.

As revealed by earlier research, the level of educational attainment of parents is important in determining whether or not their offspring attend and complete school. Parents who have attended school are better off, more likely to appreciate the importance of schooling and are in a better position to provide support for their children's education. They are therefore more likely to enrol their children, than those who have never been to school. Table eight shows that there are marked differences in the educational characteristics of fathers across the two prefectures. In Yomou, approximately 50 percent of pupils' fathers are illiterate whereas fathers of the majority of pupils in Lelouma, either have formal or non-formal schooling. In Lelouma, less than 20 percent of the respondents have illiterate fathers. Mainly because Lelouma is a strongly Islamic area, most fathers have had some form of non-formal schooling which is generally obtained through Arabic literacy and Islamic education classes. In Yomou and Lelouma the proportion of girls who are currently in school who have fathers with formal education is significantly greater than boys who are in school. In Yomou however, the differences in fathers' education characteristics between the different samples are insignificant suggesting that in Yomou at least fathers' education is not an important correlate of boys and girls' attendance at school. In Lelouma the situation is different at least for girls. The proportion of fathers with formal schooling of girls in school is significantly larger than that of fathers of girls not attending school. Interestingly it appears that the fathers of girls out of school are much more likely to have non formal schooling than those in school. This might be because parents who have non-formal schooling prefer to send their children to non-formal rather than formal schools because the education delivered in formal schools is perceived to be less relevant to them.

Table 8: Percentage of children by type of father's education

	Yomou					Lelouma				
	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs
% illiterate										
Boys	54	47	61	53	56	17	9	20	16	16
Girls	34	40	46	36	43	10	0	4	6	2
% formal										
Boys	42	40	32	425	35	40	27	20	38	23
Girls	66	53	54	62	54	80	42	12	65	25
% non-formal										
Boys	4	13	7	6	9	43	64	60	45	61
Girls	0	7	0	2	3	10	58	84	29	73
Sample size										
Boys	91	15	28	109	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44

A similar pattern can be seen in Table nine for mothers' education. In Yomou the majority of mothers are illiterate whereas in Lelouma a larger proportion have some formal or non-formal schooling. In terms of gender differences, the proportion of enrolled girls whose mothers have had formal education is about twice as large as the proportion of boys whose mothers have had formal education. This implies that if girls have mothers with formal education they are more likely to attend school than boys. However, the effect of mothers' non-formal education on girls is rather different. In Lelouma, girls whose mothers have non-formal education are much less likely to be in school compared to boys and this is significant. Again, mothers of girls out of school are much more likely to have non-formal schooling than those in school. Therefore it appears from Tables eight and nine that non-formal education in Lelouma acts as a constraint to children's schooling and particularly that of girls.

Table 9: Percentage of children by type of mother's education

	Yomou					Lelouma				
	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs
% illiterate										
Boys	80	93	93	82	93	28	18	25	27	23
Girls	61	80	92	66	86	37	5	16	25	11
% formal										
Boys	11	6.7	0	10	2	21	36	10	23	19
Girls	37	20	8	32	14	50	21	0	39	9
% non-formal										
Boys	9	0	7	8	5	51	46	65	50	58
Girls	3	0	0	2	0	13	74	84	37	80
Sample size										
Boys	91	15	28	106	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44

The likelihood of a child attending and completing school depends on the demands of the family on the child's time in performing paid work outside the home, working in the family business, or working in the home. An accurate measure of the quantity of work performed by a child is very difficult to obtain. However we use, as a proxy, a weighted family help index constructed from the frequency of times respondents performed certain outlined chores. Table 10 shows the means of the weighted help index performed by enrolled pupils and pupils out of school. In both prefectures and across the surveys, girls render more help to their families than boys regardless of whether they are enrolled in school or not. Also, the results in Table 10 indicate that the average help offered by pupils is considerably less than that offered by drop outs and the never enrolled. This is probably because a large part of a pupil's day is spent at school studying whereas a

child out of school devotes longer hours to working for the family. The average household work index is higher for girls than boys, and this is significant irrespective of whether or not they are in school. These results imply that the opportunity cost of sending a girl to school is higher than for boys.

Table 10: Average household work index by gender

	Yomou					Lelouma				
	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs
Mean household work										
Boys	11.9	13.1	17.8	12.1	16.2	7.4	9.9	15.3	7.7	13.4
Girls	17.5	28.9	24.7	20.8	27.0	17.0	28.1	23.7	21.3	25.6
Sample size										
Boys	91	15	28	109	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44

Table 11 indicates the number of children in the household. Households in Yomou appear to be slightly larger than those in Lelouma. In Yomou, there is no significant difference in the number of children in the household between the sexes and between the household of children attending school and those not attending school. In Lelouma, female pupils are more likely to come from slightly larger households than non-enrolees, although the difference is not significant for pupils and dropouts. The average number of children is greater in the households of dropouts whereas non-enrolees have the smallest number of siblings.

Table 11: Average number of children in the household

	Yomou					Lelouma				
	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs
Mean number of children										
Boys	6.2	7.6	5.6	6.4	6.3	5.3	6.5	5.3	5.5	5.7
Girls	6.5	6.8	6.2	6.6	6.5	5.5	5.5	4.5	5.5	4.9
Sample size										
Boys	91	15	28	106	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44

A child's chances of attending school can also be affected by the number of adults in the family who could substitute for the child in undertaking the chores the child would otherwise have done if he/she had not gone to school. Table 12 indicates the average number of adults in the households of the respondents. The average number of adults in households is not significantly different between surveys or between sexes except in Lelouma where girl pupils tend to come from households with fewer adults.

Table 12: Average number of adults in the household

	Yomou					Lelouma				
	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs
Mean number of adults										
Boys	3.5	4.1	3.4	3.6	3.7	2.9	2.9	3.3	2.9	3.2
Girls	3.4	2.9	3.1	3.3	3.0	2.2	3.0	3.1	2.5	3.1
Sample size										
Boys	91	15	28	106	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44

A child's probability of attending school may also depend on whom the child lives with. Those living with one parent may be required to spend more time working to support the household. Most of the children in the sample live with both parents although significant proportions of children live with other guardians. This confirms the presence of extended family support networks in Guinea. There are however no statistically significant differences between proportions of children of either sex, living with one or two parents, or with guardians.

The older children become, the more their labour is needed by the family and hence the higher the opportunity cost of sending them to school. It can be expected that children who start school late would tend not to complete. Table 14 lends support to this; those who are still in school at grade six have an average age, when starting, very near to the official school starting age. It can also be seen from Table 14 that the starting age of girls at grade six is lower than that of boys.¹⁴ This supports the view that early starting is more important for girls as they are more likely to be withdrawn from school when they reach puberty. Puberty is considered to be a culturally delicate period in a girl's life. It is a time when she attains womanhood and can get pregnant. The fear of pregnancy outside wedlock might force parents to withdraw girls from school and give them in marriage when they attain this age¹⁵.

Table 13: Percentage of children by whom they live with

	Yomou					Lelouma				
	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs
% both parents										
Boys	54	67	57	55	61	49	55	60	50	58
Girls	63	67	46	64	57	50	58	48	53	52
% living with one parent										
Boys	7	13	14	8	14	20	27	0	21	10
Girls	5	20	23	9	21	30	21	20	27	21
% other guardians										
Boys	41	20	29	38	26	31	18	40	29	32
Girls	32	13	31	26	21	20	21	32	20	27
Sample size										
Boys	91	15	28	106	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44

Table 14: Average school starting age

	Yomou					Lelouma				
	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs
Mean starting age										
Boys	8.0	8.4	-	8.1	8.4	7.3	8.0	-	7.4	8.0
Girls	7.4	7.3	-	7.4	7.3	6.9	7.2	-	7.0	7.2
Sample size										
Boys	91	15	28	106	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44

Repetition may also be a deterrent to completion; if children have to repeat a grade they will be older before they reach the last grade of primary school, which again, increases the opportunity cost of schooling and increases the probability of them dropping out. In both prefectures pupils repeat more than drop-outs although this is probably due to the fact that in a statistical sense, pupils have more chances of repeating than children who have dropped out in earlier grades. More boys than girls repeat in Lelouma, whereas in Yomou the proportion of girls repeating is higher than boys. This may also be due to the cultural realities of Lelouma where the enrolment ratios of girls are particularly low because of negative parental attitudes to

girls' schooling. As a result, parents would be more disposed to keeping boys in school than girls, even if they were not performing well in their academic work. Repetition means that it takes longer to complete primary school and that pupils become older in the process. In Lelouma where the age of girls in school are significantly lower than boys, there is a bigger chance that they will be withdrawn from school either to work at home for the family or to be given in marriage if she is of marriageable age.

Table 15: Percentage of children in the sample who have repeated a grade.

	Yomou					Lelouma				
	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs
% repeated										
Boys	71.4	40	-	67	-	61.3	45.5	-	59.3	-
Girls	86.8	66.7	-	81.1	-	53.3	31.6	-	44.9	-
Sample size										
Boys	91	15	-	106	-	75	11	-	86	-
Girls	38	15	-	53	-	30	19	-	49	-

5.2 Results from Multivariate Analysis

The variables listed in Table four above have been included as explanatory variables in three regression equations analysing:

1. The probability that the child is attending school currently or has done so in the past (i.e. whether the child is a pupil or a dropout) compared to those who have never been to school.
2. The probability that the child is in school currently (i.e. whether the child is a pupil) compared to those who are not in school (i.e. dropouts and non-enrolees).
3. The probability that the child completes school compared to those who dropout.

The sample used for the multivariate analysis shows higher attendance and completion rates than the prefecture averages (table 16).

The effect of the explanatory variables on the probability of attending/completing school are known as marginal effects for continuous variables and impact effects for dummy variables. These effects are interpreted as the change in the probability of attending school when the continuous variable is increased by one unit or the dummy variable is equal to one.¹⁶

Table 16: Size of sample included in the multivariate analyses

	No. attending/ attended primary school	No. never attended primary school	Total Sample Size	% attending/ completing primary school
Attended School				
Boys	192	48	240	80
Girls	102	38	140	73
Currently Attending				
Boys	166	74	240	69
Girls	68	72	140	49
Completion				
Boys	166	26	192	86
Girls	68	34	102	67

As mentioned previously, all of the regressions include a set of dummy variables to control for school and local characteristics. The reference school area for this set of dummy variables is School one in Yomou. The school area dummy variables control for many different factors (including school quality, ethnicity and religion) so it is difficult to interpret these explicitly. The results of these dummy variables are mixed although they are rarely significant.

Tables 17 and 18 present the marginal and impact effects of the probability that a child has been to school and the probability that a child is currently attending school. For most of the variables there is not a significant difference between the coefficients for boys and girls and hence a gender slope dummy is only included on some of the explanatory variables. Furthermore, the results from the two regressions are similar with a few exceptions.

Mothers' formal education has a positive and significant effect on the probability that their daughters have been to school (Table 17). A girl is 18 per cent more likely to have been to school if her mother has had some formal education. Whilst mothers' formal education has a positive effect on the probability that their daughters have at some time attended school, the effect for those who are currently in school is not significant (Table 18). Fathers' non-formal education appears to have a detrimental impact on educational participation of both boys and girls. The probability that a child is currently in school is reduced by 21 per cent for a boy and 55 per cent for a girl if the father has received some non-formal education (Table 18). Interestingly if mothers have non-formal education this has a positive impact on the probability of boys attending school but a negative effect on the probability of girls going to school although this result is generally not significant. A mother who has non-formal education reduces the probability that her daughter is in school by 36 per cent.¹⁷ These results suggest that non-formal schooling which includes Arabic literacy and Islamic education is more of a constraint to girls' schooling than boys'. The negative effect of mothers' non-formal education on girls' schooling maybe explained by mothers' desire to prepare girls for their perceived future roles in society, which include being good wives and mothers.

Table 17: Marginal and impact effects for regression on whether child has ever been to school

Variable	Marginal/Impact effects for whole sample	Marginal/Impact effects for boys	Marginal/Impact effects for girls
School Dummies			
School 2	0.08		
School 3	0.03		
School 4	0.02		
School 5	-0.03		
School 6	0.06		
Education Dummies			
Father formal		0.07	-0.03
Father non-formal		-0.03	-0.29*
Mother formal		0.11	0.18**
Mother non-formal		0.01	-0.04
Guardian Dummies			
Mother only	0.04		
Other guardians	-0.01		
Other Variables			
Age	0.02		
Distance	-0.004		
BMI5	-0.04		
Work for household		-0.01***	-0.003***
Wealth index		0.03**	0.02**
No. of children	0.04***		
No. of adults	0.002		
Sample size	380		
Pseudo R squared	0.22		

*significant at 10% level; ** significant at 5% level ;***significant at 1% level.

The number of children in the household has a positive and significant effect on whether a child has been to school. A child's chances of ever attending school are increased by 4% if the average number of children in

the household is increased by one. This is perhaps an indication that where household chores are spread amongst a larger number of children, the probability of each attending school is slightly increased.

Table 18: Marginal and impact effects for regression on whether child is currently attending school

Variable	Marginal/Impact effects for whole sample	Marginal/Impact effects for boys	Marginal/Impact effects for girls
School Dummies			
School 2	0.03		
School 3	0.01		
School 4	-0.04		
School 5	-0.29*		
School 6	0.12		
Education Dummies			
Father formal		0.02	0.001
Father non-formal		-0.21*	-0.55**
Mother formal		0.01	0.19
Mother non-formal		0.12	-0.36*
Guardian Dummies			
Mother only	0.04		
Other guardians	0.03		
Other Variables			
Age	-0.01		
Distance	-0.01		
BMI5	-0.21***		
Work for household		-0.02***	-0.03***
Wealth index		0.02	0.09***
No. of children	0.04		
No. of adults	0.01		
Sample size	380		
Pseudo R squared	0.29		

*significant at 10% level; ** significant at 5% level ;***significant at 1% level.

The health status of a child has an impact on school attendance. If the child is undernourished the probability that the child is currently enrolled in school is reduced by 21 per cent.

The need to work for the household also has a significant detrimental effect on the chances of both boys and girls attending school although the effect is larger for girls. The wealth index has a positive impact on the probability of attendance for both boys and girls. However the result is only significant for boys in the first regression (i.e. whether a child has ever attended school) whereas for girls the wealth index is significant in all of the regressions. This implies that girls' enrolment is more sensitive to wealth effects than boys confirming the result from the bivariate analysis.

The marginal and impact effects of a child completing school are shown in Table 19. In Table 18, pupils are compared to dropouts and non-enrolees whilst in Table 19 pupils are compared with dropouts only. The results are very similar and this implies that the dropout sample must have very similar characteristics to the non-enrolee sample. This is confirmed by the bivariate analysis. Two additional variables are included in the completion regression. Starting age suggests that the younger the child starts school, the more likely she/he is to complete although this effect is not significant. Repetition is also included in the regression suggesting that if the child repeats s/he has more chance of completing.

The results of the regression analysis broadly confirm those of the bivariate analyses and show that household and individual characteristics differentially affect the probabilities of boys and girls attending and completing school. For the regression in Table 18 analysing the probability that children are currently in school, the mean probability of attending school is 66 per cent for boys and 55 per cent for girls. Therefore, at the mean probabilities of the sample, a boy is 11 per cent more likely to be currently attending school than a girl. If a girl is under-nourished, both her parents have non-formal education and a wealth index of zero then the chance of currently attending school falls to one per cent. However, if a girl is well nourished, her mother and father have formal education and a wealth index of two then the probability that she is currently attending school increases to 76 per cent. In contrast, if a boy is under-nourished, both his parents have non-formal education and a wealth index of zero then his chances of currently attending school fall to 44 per cent. But if the boy is well nourished, his mother and father have formal education and a wealth index of two then the probability that he is currently attending school increases to 80 per cent. These results indicate that when the socio-economic status of a family is low, as is the case of many families in Guinea, boys are more likely to get primary schooling than girls. The results also indicate that family or household wealth and the educational status of parents are two important factors that influence the participation of girls at the primary level.

Table 19: Marginal and impact effects of a child completing school

Variable	Marginal/Impact effects for whole sample	Marginal/Impact effects for boys	Marginal/Impact effects for girls
School Dummies			
School 2	-0.08		
School 3	0.03		
School 4	-0.02		
School 5	-0.39*		
School 6	0.04		
Education Dummies			
Father formal		-0.09	0.03
Father non-formal		-0.22	-0.43
Mother formal		-0.04	0.02
Mother non-formal		0.16*	-0.34
Guardian Dummies			
Mother only	-0.01		
Other guardians	0.03		
Other Variables			
Distance	-0.03		
BMI5	-0.16**		
Work for household		-0.01	-0.02*
Wealth index		-0.0001	0.05**
No. of children	0.004		
No. of adults	0.003		
Start Age	-0.01		
Repetition	0.11*		
Sample size	294		
Pseudo R squared	0.33		

*significant at 10% level; ** significant at 5% level ;***significant at 1% level.

6 CONCLUSION

This paper examines family level determinants of schooling for boys and girls in Guinea using bivariate and multivariate analyses on data collected from school surveys. Three regressions were run, to investigate the probability that a child is attending school currently or has done so in the past (i.e. whether the child is a pupil or a drop-out) compared to those who have never been to school, the probability that a child is in school currently (i.e. whether the child is a pupil) compared to those not in school (i.e. drop-outs and non-enrolees) and finally the probability that a child completes school compared to those who drop out. Although it is not advisable to generalise from a small sample in what maybe an unrepresentative area, it is likely that the results obtained from the analyses in this paper do have policy implications for primary schooling in Guinea, where enrolment ratios are low and the gender gap in enrolments at the primary level is wide.

From the bivariate and multivariate analyses, we observe that the wealth index of the family is important in explaining differences in schooling between boys and girls. Although pupils attending school have a higher wealth index than those out of school, household wealth of girls at school is higher than that of boys, which suggests that poverty in a family will have a more detrimental effect upon the decision to enrol a girl in school than boys. Given the low levels of wealth in Guinea this implies that boys are more likely to attend and complete primary school than girls.

The results indicate that parents' education has an influence on childrens' schooling but the effect seems to be stronger for girls than for boys. Many more enrolled girls than boys have mothers. Who have attained some level of formal education. In the regression analysis mothers' formal education improves the chances of girls attending school by 18 per cent. In contrast, fathers' formal education as no significant impact on childrens' schooling but non-formal education of fathers has a detrimental impact on schooling irrespective of gender. However, the impact effects in the regression analysis tend to be greater for girls than boys. Mothers' non-formal education has a differential impact on attendance and completion tending to improve boys chances and reduce girls chances. These results might suggest that parents who have non-formal schooling prefer to send their children to non-formal rather than formal schools because the education delivered in formal schools is perceived to be less relevant.

With regard to the help children render to the family, we observe in both prefectures and between the surveys that girls help the family more than boys do. This might suggest that the opportunity cost of a girl's time at school is higher than the opportunity cost of a boy's time. The results corroborate those of earlier studies reviewed in section 3. However, family decisions on who gets primary schooling are not limited to the influence of the factors analysed in this paper. There are other factors linked to culture and other social customs that have not been analysed in this paper and are likely to be extremely important in the school decision making process.

In recognition of the importance of education to development and to break the cycle of educational inequality that appears to be perpetuating itself across and within families in Guinea, a range of policies to address the unequal schooling opportunities of girls and boys in Guinea are crucial. The importance of government's intervention in implementing policies to increase access and reduce gender inequalities in primary schooling cannot be overemphasised.

NOTES

- ¹ Two main interventions that contributed to these results were an ambitious school construction programme supported by communities, non-governmental organisations and donor agencies and the redeployment of more than 2,000 teachers from secondary schools and administrative posts to primary schools.
- ² The family in many developing regions often comprise a group of people who are related by birth, marriage or adoption and are often extended to include grandparents, parents brothers, sisters, uncles and aunts and cousins. In many Sub-Saharan African countries, extended families are closely connected by affection, duty and common interests and they may help and assist each other in a number of ways including child-rearing and financial support.
- ³ The relative gender gap is the female enrolment ratio relative to the male enrolment ratio.
- ⁴ A more detailed description of the sampling procedure, characteristic of the sample schools and the data collection techniques can be found in **Gender and Primary Schooling in Guinea**, Tembon et al, 1997.
- ⁵ For a summary of the tests used see Newbold 1984, p363 and p368. The test between the proportions tests the equality of two proportions and is valid for samples with approximately 40 observations or more. The test between the means tests for differences between the population means and assumes that the samples are drawn independently. The test is valid for samples with approximately 30 observations or more.
- ⁶ To maintain anonymity, the actual names of schools have not been mentioned. Schools are numbered instead.
- ⁷ For a complete description of the uses of limited dependent variables and qualitative variables in econometrics see Maddala (1983). For a summary of the methodology used in this paper see Al-Samarrai and Peasgood (1998).
- ⁸ A likelihood ratio test was carried out to test whether the pooled regression was a better specification than using two gender-disaggregated regressions. The test was not rejected implying that the pooled regression provided a better specification.
- ⁹ This comparison is only meant to be indicative. The pupils in the survey are from the last grade of primary so the enrolment ratio within this group is likely to be considerably lower than 17.8 per cent given the levels of dropout in primary school.
- ¹⁰ The tests of significance between boys and girls for each region are presented in Appendix 1, and the tests of significance between the surveys are presented in Appendix 2.
- ¹¹ The maximum possible value of the wealth index (if the household owned all the possessions included in the survey questions, had access to electricity and lived in a dwelling with a corrugated iron roof) would have been 14. The maximum in the sample was 13.
- ¹² The body mass index (BMI) by age is an anthropometric measure recommended by the World Health Organisation (WHO) for use on adolescents. BMI5 compares the weight/(height squared) of each child

to tables of the lowest fifth percentile of a reference population according to age and sex taken from WHO. If a child's BMI for age is below the fifth percentile of the reference population the child is under-nourished. Thus, the figures in Table seven imply that a large proportion of children in the sample are under-nourished. The index is not thought to be affected by differences in ethnicity.

¹³ According to customs and traditions in Lelouma, people eat in groups from one big bowl or tray. Food is shared in such a way that the men and women eat in separate groups. Boys and girls also eat in separate groups.

¹⁴ This difference is significant in the case of Yomou but not for Lelouma.

¹⁵ Getting pregnant out of wedlock can have very serious consequences for the girl's parents and family. See Tembon et al (1997).

¹⁶ Marginal and impact effects are calculated at the mean of all the other explanatory variables.

¹⁷ This relationship is significant for the regression in Table 18 but not for the regression in Table 17.

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Appendix 1: Test of significance between the sexes

This table presents the results from significance tests undertaken to investigate difference between the boys and girls within various groups and group combinations within the sample for all the variables included in the analyses.

	Yomou					Lelouma				
	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs
Mean Wealth Index										
Test Statistic	-	0.69	-2.15**	-1.67*	-1.20	-	-0.53	0.63	-1.83*	0.03
Sample size	2.33**					2.52**				
Boys	91	15	28	106	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44
Mean household work										
Test Statistic	-	-	-2.39**	-	-5.02**	-	-	-2.91**	-	-5.62**
Sample size	3.16**	5.13*		5.16**		5.24**	6.16*		8.26**	
Boys	91	15	28	109	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44
Mean age										
Test Statistic	1.43	3.20*	0.88	2.75**	2.20**	1.68*	-0.61	-0.19	-0.25	-0.59
Sample size		*								
Boys	91	15	28	106	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44
Mean starting age										
Test Statistic	2.23**	2.12*	-	2.89**	-	1.63	1.43	-	1.61	-
Sample size		*								
Boys	91	15	28	106	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44
Mean number of children										
Test Statistic	-0.47	0.56	-0.47	-0.33	-0.25	-0.35	0.71	0.69	-0.10	0.87
Sample size										
Boys	91	15	28	106	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44
Mean number of adults										
Test Statistic	0.22	1.70	0.76	1.14	1.81*	3.02**	-0.18	0.45	1.75*	0.30
Sample size										
Boys	91	15	28	106	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44

	Yomou					Lelouma				
	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs	Pupils	Drop-outs	Non-enrolees	Pupils and Drop-outs	Non-enrolees and drop-outs
Guardians										
Both parents										
Test Statistic	-1.09	0	0.71	-1.13	0.28	-0.07	-0.21	0.84	-0.35	0.49
One parent										
Test Statistic	0.24	-0.52	-0.76	-0.36	-0.78	-1.10	0.40	-2.02**	-0.70	-1.09
Other guardians										
Test Statistic	0.96	0.48	-0.16	1.37	0.39	1.08	-0.20	0.58	1.03	0.44
Sample size										
Boys	91	15	28	106	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44
Fathers' Education										
Illiterate										
Test Statistic	2.03**	0.43	0.93	2.02**	1.08	0.86	0.84	1.31	1.47	1.53
Formal										
Test Statistic	-2.53**	-0.90	-1.63	-2.48**	-1.66*	-3.89**	-0.96	0.65	-3.04**	-0.22
Non-formal										
Test Statistic	1.11	0.52	0.82	0.91	0.76	3.08**	0.34	-1.72*	1.87*	-0.97
Sample size										
Boys	91	15	28	109	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44
Mothers' Education										
Illiterate										
Test Statistic	2.12**	0.82	0.04	2.11**	0.60	-0.89	0.88	0.69	0.26	1.06
Formal										
Test Statistic	-3.42**	-1.14	-1.39	-3.21**	-1.75*	-3.08**	0.93	1.11	-1.87*	1.01
Non-formal										
Test Statistic	1.09	-	0.82	1.21	0.91	3.47**	-1.78*	-1.35	1.49	-1.83*
Sample size										
Boys	91	15	28	106	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44
Repetition										
Test Statistic	-1.603	-1.84*	-	-1.72*	-	0.74	0.84	-	1.62	-
Sample size										
Boys	91	15	-	106	-	75	11	-	86	-
Girls	38	15	-	53	-	30	19	-	49	-
BMI5										
Test Statistic	-1.27	-1.83*	-0.30	-2.00**	-1.43	-3.09**	-1.34	-2.49**	-4.08**	-2.87**
Sample size										
Boys	91	15	28	106	43	75	11	20	86	31
Girls	38	15	13	53	28	30	19	25	49	44

*significant at 10% level

**significant at the 5% level

Appendix 2: Tests of significance between the surveys

This table presents the results from significance tests undertaken to investigate difference between the surveys for all the variables included in the analyses.

	Yomou					Lelouma				
	Pupils/ drop- outs	Pupils with drop-outs/ non enrolees	Pupils/ non- enrolees	Drop- outs/ non- enrolees	Pupils/ non- enrolees with drop- outs	Pupils/ drop- outs	Pupils with drop-outs/ non enrolees	Pupils/ non- enrolees	Drop- outs/ non- enrolees	Pupils/ non- enrolees with drop- outs
Mean Wealth Index										
Boys	0.27	3.52**	3.49**	1.85*	2.55**	0.88	1.29	1.37	0.41	1.48
Girls	3.04**	1.72	2.37**	-0.68	3.08**	2.05**	4.55**	5.21**	1.79*	4.10**
Mean household work										
Boys	-0.54	-2.83**	-2.86**	-1.66	-2.49**	-1.10	-3.26**	-3.38**	-1.75*	-3.31**
Girls	-4.21**	-1.49	-2.65**	1.32	-4.26**	-4.16**	-1.01	-3.71**	1.58	-3.90**
Mean age										
Boys	-2.12**	1.43	1.17	2.41**	0.18	-1.38	-2.44**	-2.74**	-0.19	-2.81**
Girls	1.30	1.04	1.39	0.10	1.76*	-3.96**	-2.10**	-3.71	0.42	-4.68**
Mean starting age										
Boys	-0.92	-	-	-	-	-1.48	-	-	-	-
Girls	0.09	-	-	-	-	-0.85	-	-	-	-
Mean number of children										
Boys	-1.42	1.06	0.77	1.75*	-0.18	-0.96	0.15	0.02	0.74	-0.45
Girls	-0.25	0.28	0.21	0.36	-0.04	-0.04	1.78*	1.67*	1.32	1.03
Mean number of adults										
Boys	-0.88	0.51	0.27	0.97	-0.41	-0.13	-1.26	-1.27	-0.75	-1.05
Girls	1.28	0.49	0.83	-0.40	1.33	-2.66**	-2.16**	-3.20**	-0.33	-3.68**
Guardians										
Both parents										
Boys	-1.04	-0.23	-0.41	0.62	-0.84	-0.34	-0.83	-0.88	-0.34	-0.84
Girls	-0.25	1.19	1.10	1.23	0.50	-0.59	0.43	0.16	0.69	-0.19
One parent										
Boys	-0.90	-1.07	-1.21	-0.08	-1.26	-0.59	2.07**	1.99**	1.63	1.18
Girls	-1.72*	-1.44	-2.02**	-0.22	-1.89*	0.70	0.60	0.82	0.09	0.84
Other guardians										
Boys	1.55	0.89	1.16	-0.62	1.66*	0.87	-0.99	-0.83	-1.46	-0.16
Girls	1.35	-0.35	0.06	-1.37	0.89	-0.09	-1.14	-1.06	-0.84	-0.66

	Yomou					Lelouma				
	Pupils/ drop- outs	Pupils with drop-outs/ non enrolees	Pupils/ non- enrolees	Drop- outs/ non- enrolees	Pupils/ non- enrolees with drop- outs	Pupils/ drop- outs	Pupils with drop-outs/ non enrolees	Pupils/ non- enrolees	Drop- outs/ non- enrolees	Pupils/ non- enrolees with drop- outs
Fathers' Education										
Illiterate										
Boys	0.52	-0.75	-0.64	-0.94	-0.22	0.68	-0.40	-0.28	-0.79	0.14
Girls	-0.44	-0.77	-0.89	-0.41	-0.76	1.13	0.32	0.69	-0.64	0.99
Formal										
Boys	0.14	0.91	0.92	0.53	0.76	0.84	1.55	1.66*	0.47	1.68*
Girls	0.85	0.57	0.78	-0.03	0.99	2.60**	4.39**	5.24**	2.07**	4.83**
Non-formal										
Boys	-1.37	-0.26	-0.52	0.50	-0.98	-1.44	-1.24	-1.47	0.22	-1.80*
Girls	-1.48	0.45	-	0.71	-0.94	-4.46**	-5.12**	-6.70**	-1.85*	-5.59**
Mothers' Education										
Illiterate										
Boys	-0.94	-1.03	-1.18	0.03	-1.42	0.70	0.16	0.27	-0.46	0.56
Girls	-1.40	-1.82*	-2.23**	-0.78	-2.08**	2.26**	0.80	1.63	-1.00	2.19**
Formal										
Boys	0.49	1.60	1.63	0.84	1.46	-1.22	1.27	1.10	1.56	0.21
Girls	1.21	1.73*	1.93*	0.85	1.90*	2.04**	3.24**	3.69**	-1.70*	3.46**
Non-formal										
Boys	1.11	0.07	0.26	-0.78	0.72	0.34	-1.25	-1.18	-1.22	-0.70
Girls	0.54	0.45	0.51	-	0.66	-5.44**	-4.23**	-6.31**	-0.71	-5.84**
Repetition										
Boys	2.26**	-	-	-	-	0.99	-	-	-	-
Girls	1.34	-	-	-	-	1.54	-	-	-	-
Bmi5										
Boys	0.02	-1.12	-1.10	-0.84	-0.82	-2.51**	0.07	-0.34	2.05**	-1.61
Girls	-1.31	0.02	-0.30	1.09	-1.06	-1.88*	0.24	-0.49	1.56	-1.34

*significant at 10% level

**significant at the 5% level