

**WHY ARE THE CHILDREN OUT OF SCHOOL?:**

**Factors Affecting Children's Education in Egypt**

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**BY**

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## **1. Introduction:**

Despite the spectacular rise in school enrollment rates at the basic education stage over the past few decades, the strong government commitment to enforce its 1981 declaration of obligatory and free of charge basic education in Egypt, and the high value parents put on education of their children (Fergany 2000), enrollment rates are still far from universal. In 2000, 84 percent of children age 6-15<sup>1</sup> years were attending school, leaving 16 percent out of school, as reported in the 2000 Egypt Demographic and Health Survey (EDHS). Girls of that age group are the most deprived in terms of access to education. Twice as many girls as boys never attended school (EDHS 2000). However, recent trends in basic education enrollment show a bridging of the gender gap in favor of rising enrollment rates for girls at a faster pace than for boys (see for example Assaad, R., Deborah L., and Nadia Z., 2001; and Fergany, N. 2000). Looking beyond enrollment rates, the EDHS 2000 shows that repetition rates among children in basic education stage are high (14%, which is equivalent to 2.2 million children) and dropout rates are not trivial (5%, which is equivalent to 0.8 million children). Comparatively, dropout rates in Egypt are higher than other countries in the region who started education much later (Kuwait, Saudi Arabia, United Arab Emirates, Bahrain) (World Bank, 1996).

Various studies have identified a number of factors that constrain children's school enrollment and completion in Egypt. In particular, direct and indirect costs of education, represented in out-of-pocket expenses and the opportunity cost of child time, respectively, are among the most significant constrains (see for example Assaad, R., Deborah L., and Nadia Z., 2001; and Fergany, N. 2000).

Using recent data from the Egypt Demographic and Health Survey, 2000, the objective of this study is to identify the factors affecting children's education in Egypt in terms of access and completion at the basic education level. Two main questions guide this study: What are the reasons for children never attending school? And for those who did attend, what are the reasons for dropping out before completing the basic level? In answering these questions, the study will:

- (i) examine trends in basic education enrollment with specific focus on gender gaps;
- (ii) examine the varying performance of governorates in raising enrollment, especially among girls;
- (iii) analyze the factors perceived as barriers to schooling of children; and
- (iv) assess the impact of individual, household and community level variables on schooling with particular emphasis on child labor as a competing activity to participation in school.

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<sup>1</sup> The Egypt Constitution guarantees compulsory and free education at the basic stage for all Egyptian children within the age from 6 to 15 years.

The paper is structured as follows: Section 1 gives an introduction, section 2 provides a theoretical framework and outlines the hypotheses; section 3 gives a brief description of the data and the methods of analysis; section 4 discusses the levels, patterns and trends of enrollment, section 5 highlights the emerging issues in basic education, section 6 provides multivariate analysis, and section 7 offers concluding remarks and policy recommendations.

## **2. Theoretical Framework**

The theoretical framework we use in this study draws on Gary Becker's (1965) allocation of time theory, in which he assumes that households combine goods and time to produce commodities. Households try to maximize a utility in which consumption of goods and services, and time use in market, non-market, and leisure activities are arguments. Households maximize their utility subject to income and time constraints.

The time allocated for school attendance is input in the education process, which could be used to participate more fully in the labor market or home production, and therefore school time represents forgone earnings or gains to households—an indirect cost of education. The link between child schooling and child labor is complex since decisions on both are endogenous to the household decision making process and hence warrant instrumentation if they are involved in simultaneous estimation process. Using data from the Egypt 1998 Labor Market Survey (ELMS 1998), and after applying proper instrumentation on child labor, Assaad, R., Deborah L., and Nadia Z., 2001 find that child labor is strongly associated with not being in school for both boys and girls. However, due to lack of proper instruments, particularly the wage data that is not collected in the EDHS 2000, we choose not to establish any causal link between child schooling and child labor in this study. We instead use household ownership of agricultural land/farm as a proxy for potential use of child time as labor, though limited only to agricultural sector and family labor.

Moreover, households incur additional direct costs on school tuition, books and supplies, school uniforms, private lessons, and transportation, which may squeeze the household limited budget and make school costs unaffordable for poor households. Such resource constraints may bear significant gender implications on parents' decision to send girls to school. For example, about 38% of Egyptian mothers believe that parents should send the son to the university if they could afford to send only one child, compared with 7% who believe that the daughter should be sent (EDHS 2000).

Becker (1991) in his theory of comparative advantage in multi-person households states that members who are relatively more efficient at market activities would use less of their time at consumption activities than would other members. Analogously, children who perform better at school would be given the chance to continue their education as compared to those who perform less. In the subsequent sections we will see how much impact does grade repetition/failure have on school completion among Egyptian students.

Several studies have pointed to the high cost of education for poor Egyptian households. In a study undertaken by the Egypt Ministry of Education in 1993, it has been shown that families which have a monthly income not exceeding LE 6000 per annum (USD 1,765), spend on average annually LE 260 (USD 76) for primary education and LE 356 (USD 105) for preparatory education. These amounts represent at least 10% of the annual income if we just consider the upper limit of LE 6000. Fergany (1994) estimates the annual average expenditure per pupil in primary education to be about LE 250 in mid-1990s. He argues that this amount is definitely not a small sum for a poor head of household, especially if s/he has more than one child of primary school age. A more recent estimate show that the average annual cost of education per child in families with an annual income of less than or equal to LE 3600 (USD 1,028) is an estimated LE 348 (USD 99) at the primary level and LE 452 (USD129) at the preparatory level. In contrast, the annual income of a working child—estimated at LE 534— constitutes about 14% of the poverty line in urban areas and 17% of the poverty line in rural areas. This may show why children of poor families drop out of school (Seif El Dawla, A., 2000).

The EDHS 2000 contains detailed data on educational costs per pupil at the household level, which reflects the actual price of schooling and can be used to examine the impact of education costs on schooling. However, costs of education are endogenous to school attendance since parents could observe the costs ex ante, and hence needs proper instruments which are lacking in this data. To get away with the endogeneity problem we aggregate the education costs at the cluster level and estimate the average cost per pupil.

Studies that link education to per capita or household income in Egypt reveal that school enrollment significantly decreases as per capita or household income decreases, with girls' enrollment rates decreases profoundly as compared to boys (Nagi S., 2001; Fergany N., 2000). Similarly, using a proxy for households level of wealth constructed from household possessions of consumer durable, Assaad, R., et al. (2001) find that the household wealth index has a significant positive impact on children's schooling. Filmer (1999) documented a similar finding on the significant positive relationship between school

attendance and household level of wealth for 41 developing countries using DHS data. Elkogali and Suliman (2001), using data for Egypt (1995) and Yemen (1997) find significantly positive association between household level of wealth and child's schooling. The data at hand does not contain income or expenditure information, however to test for the relationship between household ability to afford educational costs and the child's schooling we develop a proxy index for household level of wealth similar to the one used by Filmer (1999). Details on the construction of the index will follow in section 3.

The findings mentioned above may indicate also that the opportunity cost of the child's time (as labor and an additional source of income) is high when compared to the actual current costs of schooling and the anticipated future returns to education. In addition, these costs may at all be unaffordable to some poor families.

Low and/or declining returns to education may impose further challenges to the household decision on sending children to schools, or keep them at home to avoid educational costs or use them as labor. Fergany (2000) argues that the low and probably declining returns to a few years of education depresses willingness of households, who cannot see their children through university education, to invest in basic education. He adds that, due to socio-cultural biases, this aversion tends to affect girls to a larger extent than boys. When a choice has to be made among children in the family to decide who goes to school, it is girls that end up staying at home. In this study we use percent of mothers and percent of fathers engaged in white-collar jobs in cluster as a proxy for return to education in community. Employees in white-collar jobs have potential for higher salaries and benefits as well as higher social prestige in their community.

Moreover, subjective evidence obtained from individual respondents (Egyptian children and mothers) reassures that cost of education is a significant barrier to school enrollment and completion (Fergany 1994; Datt, G., Jolliffe, D., and Sharma, M., 1997; EDHS 2000). It is worth mentioning that, the cost of education as a barrier, has shifted in order of importance from being the second cited reason of non-enrollment in 1994, to be the first cited reason in 1997 and 2000, consecutively. The opportunity cost of the child's time, as reflected in the household need for child time in farm/home, has been reported by about 12% of respondents as a reason for a child never having attended a school or dropped out (EDHS 2000). The survey of Child Labor in Egypt (1991) revealed that 42% of the families of working children believe that school expenses represent a heavy burden. Azer, 1993, shows that 56.2% of the families of working children could not afford to pay for group private tuition.

Becker's (1965) theory of time allocation has been found lacking the inability to incorporate the effects of power and control over resources on the intra-household allocation of time and resources, however alternative frameworks are even more limited (see for example Assaad, R., Deborah L., and Nadia Z., 2001). Traditionally, fathers have the strongest bargaining power in Egyptian households and they have the lion share in the decision making process. In this study we use a proxy for mother's autonomy and bargaining power (named the index of mother role in household decision making process). Details on the construction of the index will follow in section 3.

Empirical research entails that application of Becker's theories (1965 and 1991) to determinants of child schooling should allow for inclusion of measures of school quality which might explain significant unobserved heterogeneity exogenous to the theory of time allocation and comparative advantage. To cite a few examples of studies that link school quality to child's schooling, Cynthia B. Lloyd, et. al., (2001) using data from Egypt, find that school quality (such as time available for learning, teacher's quality, treatment by teachers and teacher attitudes) is associated with grade level attainment. Dre`ze, J. and Kingdon, G. (2001) using data from rural India find that school participation and/or grade attainment are positively influenced by several school quality variables, including infrastructure quality, teacher regularity, parent-teacher cooperation, and number of teachers per child. The EDHS 2000 lacks data on school quality, but we use a simple governorate level measure of school quality and examine its impact on school dropout rates at the governorate level.

Moreover, empirical research shows that community specific interventions deserve due consideration. For example, interventions aiming at reducing the opportunity cost of the child's time, through provision of various forms of incentives to families and children, seem to be working very well in some instances. Ravallion, M. and Quentin, W. (1999) uses data on targeted stipend program to identify how much child labor substitutes for schooling. They find that a stipend with a value considerably less than the mean child wage was enough to assure full school attendance among program participants. Their results also suggest that enrollment subsidy reduces the incidence of child labor and increases school attendance rate. Dre`ze, J. and Kingdon, G. (2001) find that provision of mid-day meal in school roughly halves the proportion of girls excluded from the schooling system in rural India.

During the past decade, Egypt has witnessed implementation of several targeted interventions aiming at reducing the gender gap in basic education through various mechanisms, including reducing the direct and indirect costs of schooling and ensuring girls access to schools within reasonable proximity and culturally appropriate context. The Ministry of Education (MOE) took the leading role in these

interventions, with generous financial assistance and/or technical cooperation from international donors; namely the UNICEF, UNESCO, UNDP, USAID, CIDA, Save the Children (SC-USA), and the Center for Development and Population Activities (CEDPA) (just to mention some).

A report released by the UNESCO in year 2000 has documented the following interventions in basic education in Egypt. Between 1990/91-1995/96 the MOE have raised its investment in basic education (school buildings and infrastructure) by 7.3% annually. In 1992 the MOE and the UNESCO have signed an agreement to establish local community schools and one-class schools with the aim of narrowing the gap found in girls education, with emphasis on reaching population of the villages, hamlets and remote areas. Between 1992/93-1998, the MOE and UNICEF launched an experimental community schools project (run by female teachers) aiming at providing access to basic education for girls of the poor and the deprived rural areas. A report released by CIDA in year 2002, shows that in 1997 CIDA has launched a community based and girl-friendly education project aiming at providing access to quality basic education in three governorates in Upper Egypt (Assuit, Sohag, and Qena).

A USAID 2002 news release shows that, the USAID has began a girls' education program in Egypt in 1996 with the aim of improving quality (through teacher training and improved instructional materials), increasing access in under-served areas (by constructing schools), and providing scholarships and tutorials jointly with SC-USA and CEDPA. The project was implemented in two governorates in Upper Egypt (Minya and Beni Suef), one in the Nile Delta area (Behera) and the urban slums of Cairo.

### **3. Data and Methods**

#### **3.1 Data**

The data used in this paper come from Egypt 1995 and 2000 DHS rounds. To reflect the most recent picture on children's education we primarily use the Egypt DHS 2000. The Egypt DHS uses standard survey instruments to collect data on household members (sex, age, relation to head, education, work status, ...etc) and household living conditions (possession of consumer goods and sanitary and housing characteristics). Both Egypt 1995 and 2000 DHS, collect detailed information on children's education including, current schooling status, cost of education, current work status, reasons for never attending school and reasons for dropping out of school (as perceived by the respondents-- the mothers). In addition the DHS collects information on fertility, mortality and mother and child health from ever-married women in reproductive ages (15-49 years). The DHS is based on national samples and it allows for breakdowns, for all indicators, by urban-rural and major regions and by governorates for most of the

indicators (except for fertility and mortality measures). The DHS data is collected based on a complex sample design (Multi-stage stratified cluster sampling). Egypt DHS has designated sample weights that should be employed in order to derive nationally representative indicators. In this paper we use the designated weights, and we restrict the analysis to only the usual residents in the sample (De Facto population). The Egypt 1995 DHS has successfully interviewed 15,567 and 14,779 households and ever married women aged 15-49 years, respectively. The Egypt 2000 DHS has successfully interviewed 16,957 and 15,573 households and ever married women aged 15-49 years, respectively. Data on children's education is collected for 20567 Children age 6-15 years.

### **3.2 Methods**

We basically employ two methods in this paper. First, we apply a data reduction technique, using the principle component analysis, to construct two indices of valuable interest to this study namely; a proxy index for household standard of living/wealth level and a proxy index for mother's role in household decision making process. Second, we apply a data analysis technique starting with simple bivariate analysis and ending with a multivariate analysis based on multi-level logistic model.

#### **3.2.1 The standard of living/wealth index**

In absence of information on variables needed for computing conventional measures of wealth and living standard, namely household income and consumption data, use of alternative measures has become increasingly documented in the recent literature. These measures are derived mainly from information on household ownership of durable goods and assets. A number of studies have recently used the principle component technique to extract a standard of living index from a set of household durable goods and assets for a group of developing countries participated in the DHS rounds (e.g. Gwatkin et al., 2000 and Filmer D. and Pritchett L., 1998). Filmer and Pritchett (1998), argue that an index constructed from the questions about household assets and housing characteristics (e.g. construction materials, drinking water and toilet facilities) works as well, and arguably better, than income and consumption as a proxy for household long-run wealth. The aforementioned studies have both used the first principle component as the proxy for the standard of living. Filmer and Pritchett (1998), argue that the first principle component is the linear index of the variables used in the factor analysis and it captures the most common variation among them.

In this paper, we use the same approach for constructing a standard of living/wealth index. We believe that the consumer goods or items used in the principle component analysis in this paper are economically valuable and reasonably sufficient to reflect differences in household wealth and living standards. The



upper panel of Appendix A presents the factor scores associated with each variable. For the purpose of the analysis in this paper, the final index is grouped into quintiles ranging from the lowest to highest. By this classification we adopt a relative poverty line in which we assumed that households in the lowest quintile of the standard of living index distribution are ‘poor’ by definition.

### **3.2.2 Mother’s Role in Household Decision-Making Process**

In an exactly similar methodology to the one used for constructing the standard of living index we construct the woman role in household decision making process. We use data collected from respondents on a battery of questions having to do with “who have the final say on specific issues” that include: Own health care, large household purchases, household purchases for daily needs, food to be cooked each day, visits to family or relatives. Each of these variables is coded as equal to 2 if the respondent have the final say, 1 if the respondent and husband or someone else have the final say, and 0 if the husband or someone else have the final say. The lower panel of Appendix A presents the factor scores associated with each variable.

### **3.2.3 The Model**

Our goal is to examine the effect of child, household, and community-level variables on the likelihood of a child never attending a school or dropping out. Given the dichotomous nature of the dependent variables and the hierarchical structure of the data, we fit a multi-level logistic model. This model will capture the effect of observed and unobserved child, household, community, and other level variables. We fit a three-level model with random effects for households and community, using the “**gllamm**” command in STATA that handles these kinds of models.

To assess the impact of the community level variables, on school never attendance and dropout, we run two models (Model I, and Model II). In Model I, we omit the community level variables and regress the school never attendance and school dropout, each separately, on a set of child and household variables namely; age of child, grade failure/repetition, household level of wealth, residence, parent’s education, woman role in household decision making, and household ownership of farm land. In Model II, we add on a set of community variables related to cost of education and a proxy for returns to education (percent of mother’s and fathers with white-collar jobs in cluster). Based on the gender differences in school never attendance and dropout observed in section 2, and from a policy oriented point of view, we fit the two models for girls and boys, separately.

In a general form, the logistic regression model with a vector of child, household, and community level variables and random intercepts at levels 2 and 3, is state as:

$$\eta_{ijk} = \beta_0 + \beta_{1c} * X_{cijk} + \beta_{2h} * X_{hjk} + \beta_{3n} * X_{nk} + U_{jk} + U_k$$

Where,

$\eta_{ijk}$  = Log odds of the event

$X_{cijk}$  = Vector of child variables

$X_{hjk}$  = Vector of household variables

$X_{nk}$  = Vector of community variables

$\beta_{1c}$ ;  $\beta_{2h}$ ; and  $\beta_{3n}$  are vectors of parameters to be estimates

$U_{jk}$  = Random intercept at level 2 (household)

$U_k$  = Random intercept at level 3 (Community/cluster)

### 3.2.4 Measurement of variables

The dependent variables are binary variables. The school never attendance is coded 1 if the index child never attended school and 0 if ever attended. The school dropout is coded 1 if the index child dropped out and 0 if still in school. The independent variables include: child age which is used as categorical variable with age 8 and age 12 used as references for never attendance and dropout, respectively. We exclude children ages 7 and lower from the never attendance equation to allow for late enrollment. We retain all age categories in the dropout equation, but we use age 12 as reference as it represents the last year of the final grade of the primary stage. Child academic performance is measured by whether the child has ever repeated or failed a grade (coded 1) or not. Household wealth level and mothers autonomy are used in quintiles with the lowest quintile kept as reference category in each. Residence is coded as 1 if the family live in rural areas and 0 if lives in urban areas. The household ownership of farm/land is coded as 1 if the household owns a farm/land and 0 if not. Parents years of education, cost of education in cluster, and percentage of mother's and father's in white-collar jobs in cluster are used in interval scale.

#### 4. Levels, Patterns and Trends in Basic Education in Egypt:

##### Enrollment Levels and Patterns:

Table 1 shows the schooling status of children ages 6 to 15 by gender and level of household wealth. Overall, 84% of children ages 6 to 15 are in school leaving 16% of the age group out of school. While the gender gap between girls and boys is small among those currently attending school, twice as many girls as boys have never attended school. However, more boys than girls drop out, which may suggest that once girls attend school they are more likely to stay. In terms of household wealth, the table also shows a positive association with school attendance and a negative association with non-attendance and dropout. That is, school attendance increases monotonically with household wealth while non-attendance and dropping out systematically decreases with household wealth. The gender gap is biggest among the poor. Girls from poor household are the most likely to have never attended school compared to girls from richer households, and compared to boys from poor households as well, where girls are 2.5 times more likely to have never attended school.

**Table 1. Current Schooling Status of Children 6-15, by gender and wealth, Egypt 2000**

| Schooling status  | Males       |         |         |         |             |       | Females     |         |         |         |             |       |
|-------------------|-------------|---------|---------|---------|-------------|-------|-------------|---------|---------|---------|-------------|-------|
|                   | Poorest 20% | 2nd 20% | 3rd 20% | 4th 20% | Richest 20% | Total | Poorest 20% | 2nd 20% | 3rd 20% | 4th 20% | Richest 20% | Total |
| Never attend.     | 11.3        | 8.6     | 6.2     | 5.6     | 2.7         | 7.8   | 29.0        | 17.3    | 7.9     | 4.0     | 2.7         | 14.4  |
| Currently attend. | 81.1        | 84.3    | 88.8    | 92.1    | 96.6        | 86.8  | 65.2        | 77.9    | 87.9    | 94.2    | 96.1        | 81.6  |
| Dropped out       | 7.3         | 6.9     | 4.8     | 2.1     | 0.7         | 5.2   | 5.3         | 4.5     | 3.9     | 1.7     | 1.0         | 3.8   |
| Don't know        | 0.3         | 0.1     | 0.2     | 0.3     | 0.0         | 0.2   | 0.4         | 0.3     | 0.3     | 0.1     | 0.1         | 0.3   |
| Total             |             |         |         |         |             |       |             |         |         |         |             |       |
| %                 | 100.0       | 100.0   | 100.0   | 100.0   | 100.0       | 100.0 | 100.0       | 100.0   | 100.0   | 100.0   | 100.0       | 100.0 |
| N                 | 2841        | 2737    | 2181    | 1762    | 1008        | 10528 | 2560        | 2530    | 2161    | 1823    | 966         | 10042 |

Source: Authors calculations using Egypt DHS data 2000.

Note: All gender and wealth differences are statistically significant at 1% or lower based on chi-square test.

The Egypt 2000 DHS shows that the majority of basic education students are in public schools (87%), with 7% in religious schools and 6% in private schools, which reflects a small contribution of the private sector in the education sector. A breakdown by gender and level of household wealth (table 2.) shows similar patterns of enrollment by school type for girls and boys; A small gender gap is observed among students in religious schools where more boys than girls attend. However, in terms of wealth levels, there is a clear gap whereby private schools are attended only by the richest 40% of the population. Only about 1-2 percent of the poorest 60 percent attends private schools; the majority is in public and religious schools. The relatively higher annual registration and tuition fees charged by the private schools (LE 600) as compared to public schools (LE 25)(EDHS 2000) might explain the reason for the low demand for

private education at the basic stage level by Egyptian parents. If the private sector provide relatively high quality education, as presumed, then it is the rich who are exclusively enjoying the benefit.

**Table 2. Distribution of children 6-15 years currently attending school, by school type, gender, and wealth, Egypt, 2000**

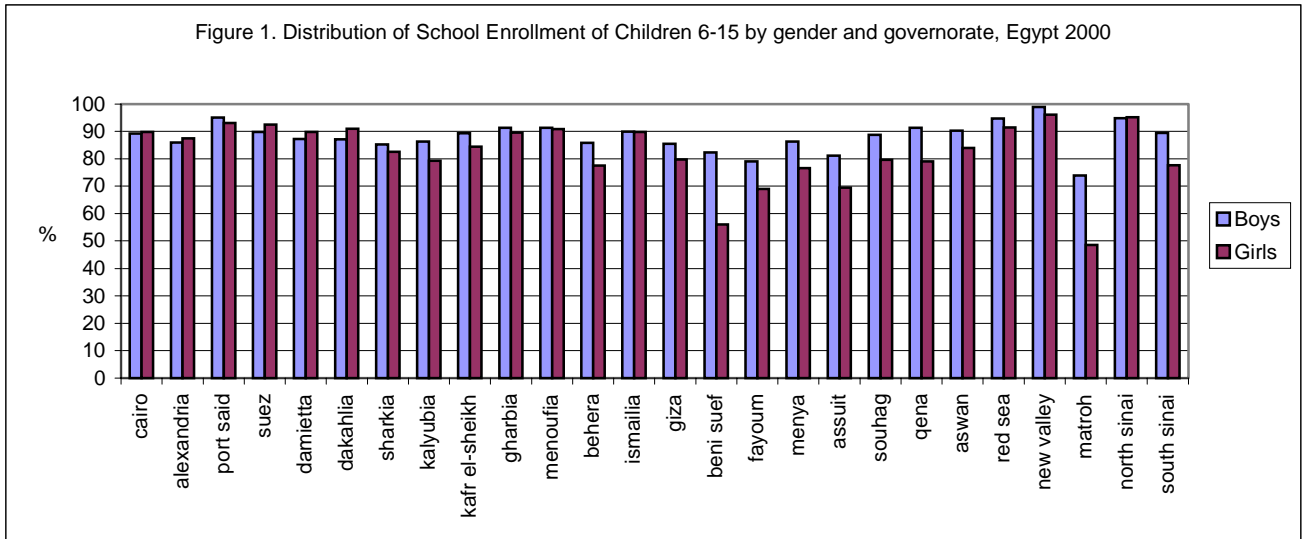
| School type | Males       |         |         |         |             |       | Females     |         |         |         |             |       |
|-------------|-------------|---------|---------|---------|-------------|-------|-------------|---------|---------|---------|-------------|-------|
|             | Poorest 20% | 2nd 20% | 3rd 20% | 4th 20% | Richest 20% | Total | Poorest 20% | 2nd 20% | 3rd 20% | 4th 20% | Richest 20% | Total |
| Public      | 89.3        | 89.5    | 91.7    | 83.7    | 66.4        | 86.4  | 92.4        | 93.2    | 91.7    | 87.3    | 68.0        | 88.6  |
| Private     | 0.0         | 0.4     | 0.8     | 11.1    | 30.6        | 5.5   | 0.2         | 0.5     | 1.4     | 9.2     | 29.9        | 5.8   |
| Religious   | 10.7        | 10.2    | 7.5     | 5.2     | 3.0         | 8.1   | 7.4         | 6.3     | 6.8     | 3.5     | 2.0         | 5.6   |
| Total       |             |         |         |         |             |       |             |         |         |         |             |       |
| %           | 100.0       | 100.0   | 100.0   | 100.0   | 100.0       | 100.0 | 100.0       | 100.0   | 100.0   | 100.0   | 100.0       | 100.0 |
| N           | 2274        | 2281    | 1921    | 1611    | 964         | 9051  | 1658        | 1959    | 1889    | 1703    | 925         | 8133  |

Source: Authors calculations using DHS data, 2000

Note: All gender and wealth differences are statistically significant at 1% or lower (based on chi-square test).

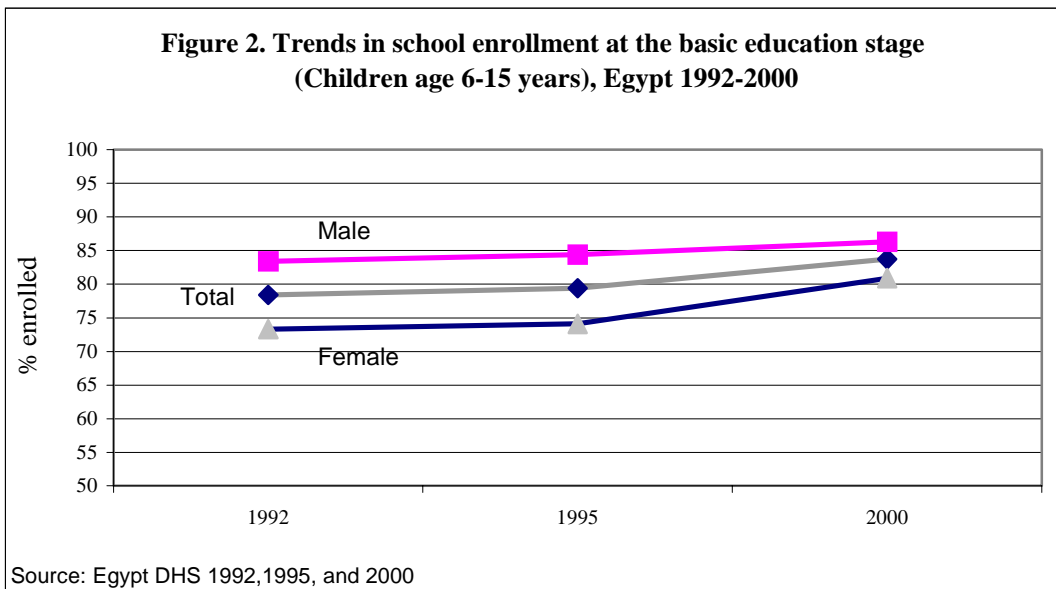
Figure 1 shows the distribution of school enrollment for children 6-15 by gender and governorate in Egypt. As shown, Gender gaps in enrollments vary widely by governorate. There is a clear demarcation between Lower and Upper Egypt, where in Lower Egypt and especially in urban governorates, there is no clear gap in enrollments between boys and girls<sup>2</sup>. It is worth mentioning that in some governorates (Alexandria, Suez, Damietta and Dakahlia) girls' enrollment exceeds that of boys. On the contrary, with the exception of North Sinai, there are noticeable gender disparities in enrollments in the governorates of Upper Egypt and the frontier governorates. In Beni Suef, and Matroh gender gap is strikingly large, where boys' enrollment reaches 1.5 times that of girls.

<sup>2</sup> As shown in Figure 1 (from left to right): Lower Egypt includes Cairo through Ismailia, Upper Egypt includes Giza through Aswan, and the Frontier governorates include Red Sea through South Sinai.



Data calculated by authors from EDHS 2000.

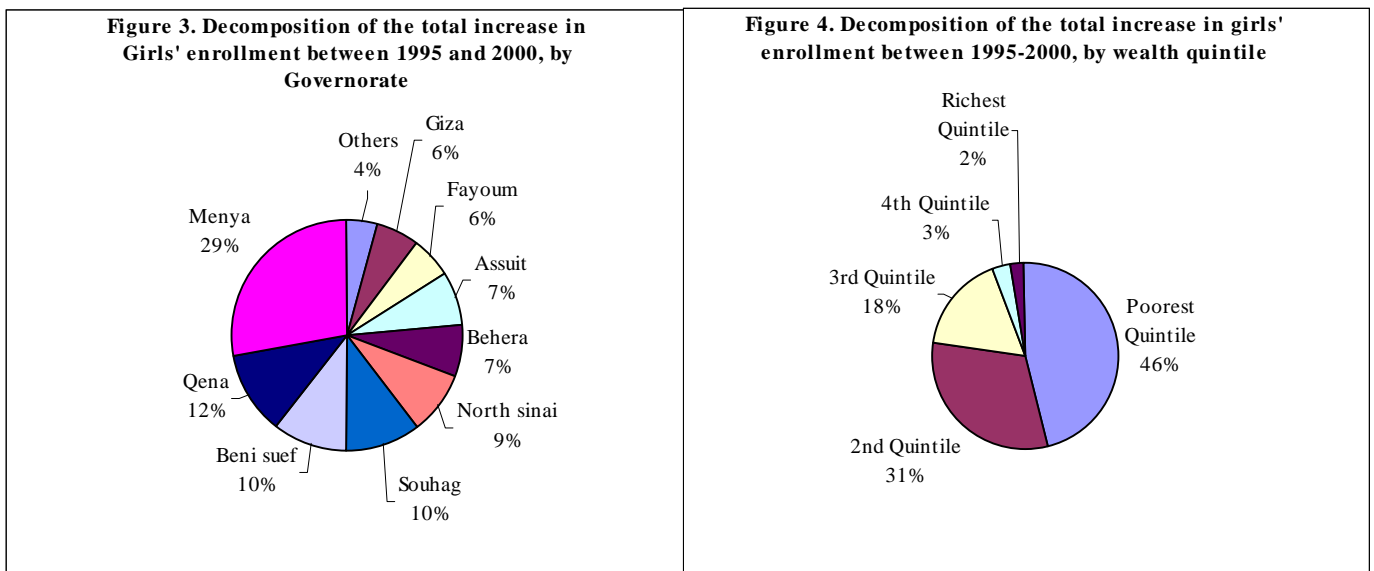
Despite the existence of wide gender gaps in some governorates, there has been a noticeable improvement in girls' enrollment in the five years preceding the EDHS 2000. Figure 2 shows the trends in school enrollment in basic education between 1992 and 2000. The graph shows a slow and steady increase in enrollment between 1992 and 1995 for both boys and girls, but a relatively much higher increase in girls' enrollment between 1995 and 2000, where girls enrollment rate grew by twice as much as that of boys.



In an attempt to pinpoint where the increase in girls' enrollment has come from, we track changes in enrollment rates by governorate. Figure 3 shows a decomposition of the total increase in girls' enrollment

between 1995 and 2000 by Governorate. The graph reveals notable increases in enrollment in governorates of Upper Egypt. In Menya, the increase in girls' enrollments accounts for almost 30 percent of the overall nation's total increase in girls' enrolment in the respective five years period. Increase in girls' enrollments in each of Qena, Beni Suef, Souhag and North Sinai governorate accounts for 9-12 percentage points of the nation's overall increase. In Assuit, Behera, Fayoum and Giza the increase in girls' enrollments account for 6-7 percentage points each, of the nation's overall increase. Whereas the increase in girls' enrollments, in the rest of the governorates combined, account for only 4% of the overall nation's increase in girls' enrollments. The governorates, which showed profound success in raising girls' education, are clearly the ones targeted by the MOE and other donors' interventions (described in details in section 2 above).

We further decomposed the total increase in girls' enrollments by household level of wealth (Figure 4). The figure shows that the Poor have benefited disproportionately from the MOE and the donor's interventions, where for example, 46% of the nation's overall increase in girls' enrollment is accounted for by the poorest 20% of the population. While these findings are by means much of a surprise since the areas where the interventions took place are predominantly poor, yet the findings bear witness to the ability of these interventions, in effectively reaching their targeted population. It is a success that deserve much of appreciation and the credit goes to the MOE and its local community and international donor

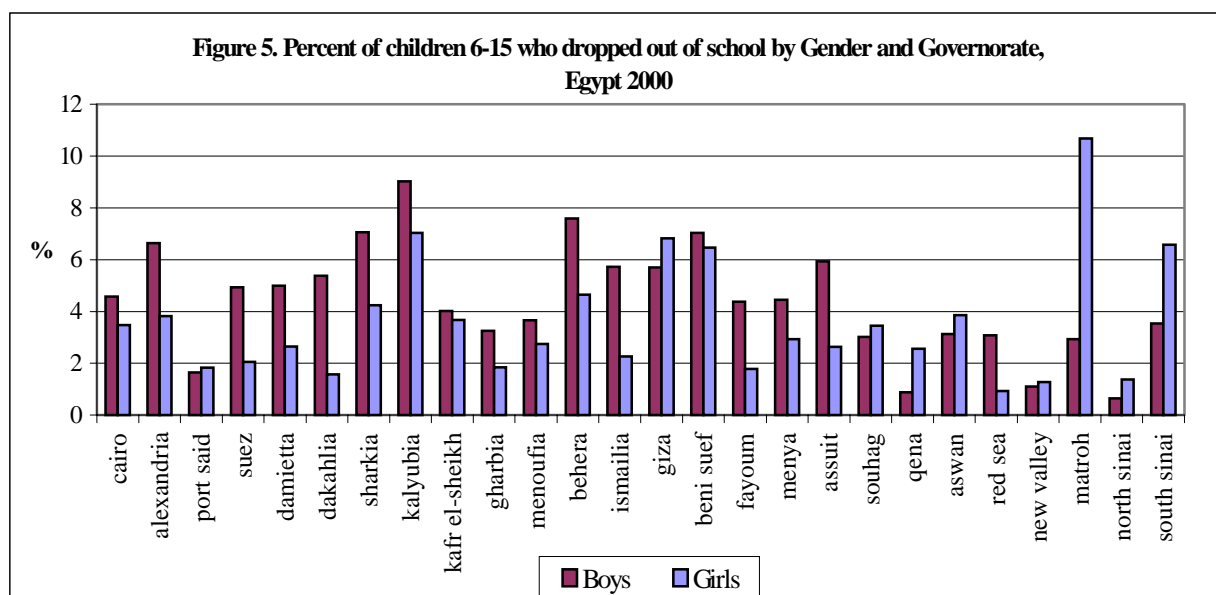
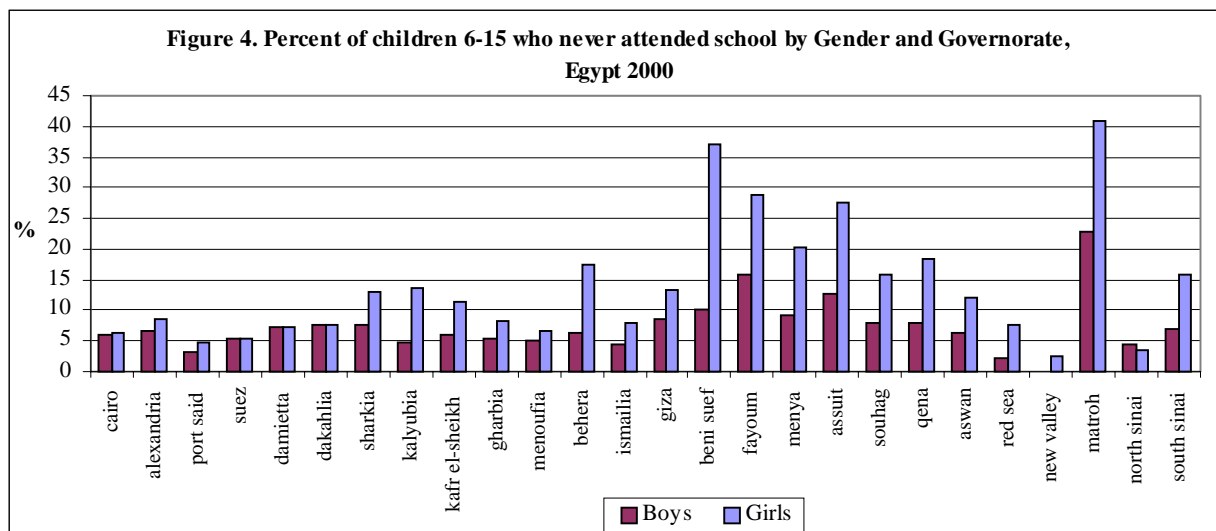


collaborators, namely the UNICEF, UNESCO, UNDP, USAID, CIDA, Save the Children (SC-USA), and the Center for Development and Population Activities (CEDPA) (just to mention some).

## **5. Emerging Issues in Basic Education in Egypt**

Despite much effort during the past five years and significant progress in putting girls in school, much remains to be done in achieving universal basic education and eliminating the gender gaps. Figures 4 and 5 show the distribution of children who never attended school and children who dropped out by gender and governorate. The two figures show where the challenges remain. Figure 4 shows that much need to be done in Upper Egypt and the Frontier governorates. In Matrouh and Beni Suef, for example about 40 percent of girls never attended school, and in Fayoum and Assuit more than a quarter of girls never attended school. Whereas in Lower Egypt, large gender gap and higher percentage of girls' non-enrollment are only notable in Behera governorate, where more than 15% of girls have never attended school.

While one would expect girls to be always at a disadvantage in education as compared to boys, however figure 5 shows an interestingly non-conventional pattern of schooling. Generally speaking, the gender gap in dropout rates is reversed, with boys dropping out more than girls do in a vast majority of governorates. Levels of dropout rates in Lower Egypt are pretty similar to those in Upper Egypt, if not worse. Dropout rates in Matrouh governorate alarmingly far exceeding the levels observed for the rest of governorates, with a huge gender gap reflecting profound exclusion of girls from the basic education system. A similar pattern of dropout, though less profound, is observed in South Sinai governorate. In the following section we analyze the reasons behind children never attending school or dropping out using mother's own reports of the perceived reasons.



### 5.1 Mothers' Perception of Reasons for Never Attendance and Dropout

In the 2000 EDHS, mothers were asked to list the reasons why their children never attended school or if they ever attend why they dropped out. Table 3 show mothers' reported reasons for school never attendance and dropout by gender and household level of wealth. As shown, the direct cost of education is perceived as the number one reason for not sending children to school. Traditions and customs are obvious obstacles to girls enrollment, and the indirect costs (child need for labor), and the children disinterest in education are perceived barriers to both girls and boys enrollment.



In regards to differences by wealth level, 4 out of the 9 reasons identified by the EDHS 2000, turned out to be statistically significant ( $P \leq 0.05$ ) for both sexes. These are: (i) school is too expensive/no money to pay education costs, (ii) children are needed as labor at home/farm, (iii) children are not interested in attending school, and (iv) school is too far. Additionally, mothers living in households that fall in the lower 60 percentile of the wealth rank cited that school is not important for girls. Mothers perceive that the direct cost of education is a significant reason for not sending children to school particularly girls of the poor. This might imply that in households with limited financial resources the boys might get priority for education over the girls. It is also the case when a child is needed for labor. School is too far, is cited by the poor as another reason for school never attendance and dropout for both girls and boys.

The lower panel of table 3 shows that the most cited reasons for dropout among both sexes are, child not interested in school and child failed/repeated a grade followed by the cost related reasons and school not important. With regard to wealth disparities in the reasons cited by mothers for why children dropout, the direct monetary costs and the opportunity cost of schooling represented by the family need for children in labor activities are the only significant reasons for girls dropout but not for boys. Costs in general are significantly perceived more by the poor as reasons for girls' dropout. However, one could notice that children of the richest 20% stand a relatively better chance of not dropping out due to grade failure/repetition (as perceived by their mothers).

The above perception perhaps entails two plausible propositions. First, it could either be that, rich parents tend to keep their children in school regardless of their academic performance, or second, it could be that the phenomena of grade failure/repetition is less common among the children of the richest 20%. While we cannot assume any inherent superior cognitive abilities for children of the richest 20% over other children, however the fact that around one third of the children of the richest 20% attend private schools where high quality education is expected to be provided might offer an explanation to the later argument. We will further investigate this proposition in the section on quality of education (section 5.3).

It is not clear why nearly half of the mothers perceive that children dropout because they become not interested in school. There has to be reasons related to the child and these reasons warrant further investigation. However, by saying that the child is not interested, mothers are probably expressing their perception in an ex-post-rationalized context to intentionally obscure the real fact of their children's dropout. That is to say, children are perhaps not performing academically well in school rather than anything else. When children do not perform well they usually become less interested in school and the frustration and stigma attached to low academic performance might derive them to dropout.



**Table 3 : Mothers' reported reasons for school never attendance and dropout, by gender and household level of wealth, Egypt 2000**

| Reasons for never attending school     | Boys           |            |            |            |                |            |         | Girls          |            |            |            |                |             |         |
|--|----------------|------------|------------|------------|----------------|------------|---------|----------------|------------|------------|------------|----------------|-------------|---------|
|  | Poorest<br>20% | 2nd<br>20% | 3rd<br>20% | 4th<br>20% | Richest<br>20% | Total      | P-value | Poorest<br>20% | 2nd<br>20% | 3rd<br>20% | 4th<br>20% | Richest<br>20% | Total       | P-value |
| <b>Cost related</b>                    |                |            |            |            |                |            |         |                |            |            |            |                |             |         |
| School expensive/no money to pay costs | 37.4           | 28.1       | 5.1        | 0.9        | 0.0            | 23.7       | 0.00    | 46.5           | 31.6       | 9.7        | 5.4        | 3.8            | 34.8        | 0.00    |
| Child needed as labor at home/farm     | 13.0           | 8.2        | 8.2        | 4.6        | 0.0            | 9.4        | 0.04    | 14.0           | 20.0       | 8.4        | 2.3        | 0.0            | 14.3        | 0.00    |
| <b>Child related</b>                   |                |            |            |            |                |            |         |                |            |            |            |                |             |         |
| Child not interested                   | 14.1           | 16.0       | 5.4        | 8.4        | 0.0            | 12.0       | 0.01    | 11.3           | 15.8       | 7.0        | 3.7        | 0.0            | 11.5        | 0.00    |
| Child ill/disabled                     | 8.2            | 5.4        | 7.2        | 14.0       | 6.0            | 7.9        | 0.20    | 2.4            | 2.4        | 3.4        | 10.7       | 0.0            | 2.9         | 0.01    |
| <b>School related</b>                  |                |            |            |            |                |            |         |                |            |            |            |                |             |         |
| School of poor quality                 | 0.1            | 0.9        | 0.0        | 0.0        | 0.0            | 0.3        | 0.34    | 0.2            | 0.5        | 0.8        | 0.0        | 0.0            | 0.4         | 0.72    |
| School too far                         | 4.4            | 0.5        | 0.0        | 0.0        | 0.0            | 1.8        | 0.00    | 4.1            | 1.7        | 1.8        | 0.0        | 0.0            | 2.8         | 0.03    |
| <b>Other</b>                           |                |            |            |            |                |            |         |                |            |            |            |                |             |         |
| School not important                   | 3.5            | 6.1        | 0.9        | 4.6        | 0.0            | 3.8        | 0.16    | 6.0            | 8.8        | 5.0        | 1.2        | 0.0            | 6.4         | 0.05    |
| Traditions/customs                     | 1.4            | 1.5        | 0.0        | 0.0        | 0.0            | 1.0        | 0.50    | 17.4           | 15.0       | 14.4       | 10.1       | 11.3           | 15.8        | 0.44    |
| Other                                  | 3.9            | 2.0        | 4.2        | 0.0        | 0.0            | 2.8        | 0.23    | 7.9            | 7.7        | 6.1        | 3.6        | 0.0            | 7.2         | 0.37    |
| <b>N</b>                               | <b>321</b>     | <b>236</b> | <b>136</b> | <b>98</b>  | <b>27</b>      | <b>819</b> |         | <b>743</b>     | <b>438</b> | <b>170</b> | <b>73</b>  | <b>27</b>      | <b>1450</b> |         |
| <b>Reasons for dropout</b>             |                |            |            |            |                |            |         |                |            |            |            |                |             |         |
| <b>Cost related</b>                    |                |            |            |            |                |            |         |                |            |            |            |                |             |         |
| School expensive/no money to pay costs | 9.2            | 10.5       | 6.3        | 6.1        | 0.0            | 8.8        | 0.70    | 18.9           | 13.1       | 8.4        | 3.0        | 0.0            | 12.9        | 0.04    |
| Child needed as labor at home/farm     | 11.5           | 13.7       | 6.3        | 17.5       | 0.0            | 11.5       | 0.12    | 16.1           | 7.2        | 21.1       | 4.6        | 0.0            | 13.2        | 0.04    |
| <b>Child related</b>                   |                |            |            |            |                |            |         |                |            |            |            |                |             |         |
| Child failed/repeated                  | 37.0           | 48.5       | 37.4       | 35.8       | 23.1           | 40.8       | 0.18    | 29.8           | 39.0       | 35.1       | 42.5       | 16.9           | 34.5        | 0.44    |
| Child not interested                   | 62.6           | 57.0       | 59.5       | 36.7       | 63.0           | 58.3       | 0.12    | 40.9           | 51.3       | 49.7       | 46.8       | 52.0           | 46.8        | 0.61    |
| Child ill/disabled                     | 4.0            | 1.9        | 2.4        | 7.8        | 17.0           | 3.4        | 0.16    | 4.9            | 2.8        | 0.0        | 0.6        | 14.4           | 3.0         | 0.06    |
| <b>School related</b>                  |                |            |            |            |                |            |         |                |            |            |            |                |             |         |
| School of poor quality                 | 2.9            | 3.0        | 1.4        | 3.2        | 0.0            | 2.6        | 0.93    | 2.2            | 2.4        | 3.1        | 4.6        | 0.0            | 2.6         | 0.95    |
| School too far                         | 0.6            | 1.3        | 0.0        | 0.0        | 0.0            | 0.7        | 0.73    | 2.9            | 1.1        | 0.6        | 4.2        | 0.0            | 1.9         | 0.45    |
| <b>Other</b>                           |                |            |            |            |                |            |         |                |            |            |            |                |             |         |
| School not important                   | 16.2           | 9.2        | 13.5       | 15.0       | 20.1           | 13.2       | 0.42    | 12.4           | 9.1        | 14.3       | 16.3       | 2.4            | 11.9        | 0.57    |
| Traditions/customs                     | 0.0            | 0.0        | 0.0        | 0.0        | 0.0            | 0.0        |         | 1.5            | 1.3        | 1.8        | 6.9        | 2.5            | 2.0         | 0.18    |
| Child had enough education             | 0.0            | 0.0        | 2.3        | 0.0        | 0.0            | 0.4        | 0.08    | 4.0            | 3.7        | 5.9        | 1.5        | 2.5            | 4.1         | 0.72    |
| Other                                  | 1.0            | 0.0        | 0.0        | 0.0        | 0.0            | 0.4        | 0.52    | 1.2            | 0.0        | 0.0        | 4.6        | 0.0            | 0.8         | 0.18    |
| <b>N</b>                               | <b>208</b>     | <b>189</b> | <b>104</b> | <b>36</b>  | <b>7</b>       | <b>544</b> |         | <b>137</b>     | <b>114</b> | <b>85</b>  | <b>31</b>  | <b>10</b>      | <b>377</b>  |         |

Source: Author's calculations

## 5.2 Combining school and work

In this section we intend to examine how children and their families allocate time between school and work activities. To allow for a broader and a more comprehensive definition that value both work at home and work off home, our definition for work includes working for pay, unpaid work and doing household chores for at least 4 hours a day.

Table 4 shows the schooling and work status among children 6-15 by gender and level of wealth. The table reveals that children of poor households are significantly more likely to do work only or do work while attending school as compared to children of non-poor households ( $P \leq 0.01$ ). On the other hand children of poor households are significantly less likely to attend school only or neither work or attend school as compared children of non-poor households ( $P \leq 0.01$ ). Girls and boys combine school and work at nearly equal rates whereas work only is more among girls than boys. Among the poorest 20% there are twice as many girls as boys who engage in work only. As like the case of the high opportunity cost of child's time perceived by mothers of poor households, these results reflect actual realities of higher opportunity cost of child time among the poor. For poor families, the value of child time needed to maintain survivorship could far exceeds the anticipated benefits of sending children to school.

If work while attending school deters the scholastic achievement of students then children of poor households are perhaps placed at a disadvantaged situation by being working while attending school. The data at hand does not permit any further exploration of this issue and further research in this respect is warranted.

**Table 4. Schooling and work among Children 6-15 by Gender and Level of Wealth, Egypt, 2000**

| Schooling and work | Males       |         |         |         |             |       | Females     |         |         |         |             |       |
|--------------------|-------------|---------|---------|---------|-------------|-------|-------------|---------|---------|---------|-------------|-------|
|                    | Poorest 20% | 2nd 20% | 3rd 20% | 4th 20% | Richest 20% | Total | Poorest 20% | 2nd 20% | 3rd 20% | 4th 20% | Richest 20% | Total |
| School & work      | 8.7         | 6.9     | 3.2     | 1.9     | 0.7         | 5.2   | 6.6         | 5.3     | 5.6     | 3.7     | 1.5         | 5.0   |
| School only        | 72.3        | 77.5    | 85.6    | 90.1    | 95.9        | 81.6  | 58.6        | 72.7    | 82.3    | 90.5    | 94.6        | 76.5  |
| Work only          | 7.5         | 6.0     | 3.4     | 1.9     | 0.5         | 4.6   | 14.1        | 9.0     | 3.3     | 1.1     | 0.3         | 6.8   |
| Neither            | 11.5        | 9.7     | 7.8     | 6.0     | 3.0         | 8.5   | 20.7        | 13.1    | 8.7     | 4.7     | 3.5         | 11.6  |
| Total              |             |         |         |         |             |       |             |         |         |         |             |       |
| %                  | 100.0       | 100.0   | 100.0   | 100.0   | 100.0       | 100.0 | 100.0       | 100.0   | 100.0   | 100.0   | 100.0       | 100.0 |
| N                  | 2841        | 2737    | 2181    | 1762    | 1008        | 10528 | 2560        | 2530    | 2161    | 1823    | 966         | 10042 |

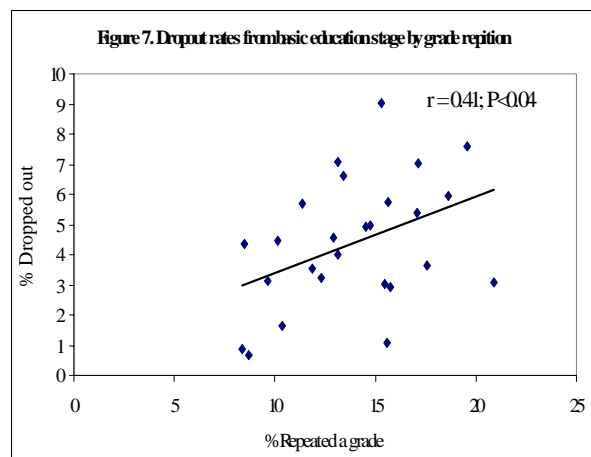
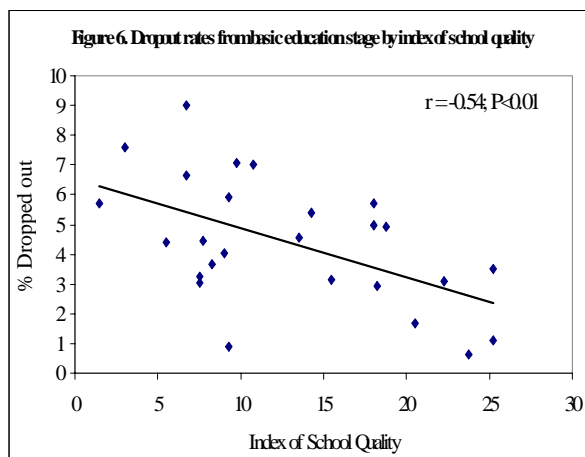
Source: Author's calculations

Note: All gender and wealth differences are statistically significant at 1% or lower based on chi-square test.

### 5.3 Quality of education

High quality of education is a desirable goal for all nations. For any developing country aiming to have strong global economic, political and social competitiveness it has to maintain both horizontal (increased enrollment) and vertical (high quality) expansion in its educational system. In this section we analyze quality of education in Egypt and its implications on school attendance rates. We use limited but powerful measure of quality created from two important indicators of quality at the governorate level, namely the class density (measured by number of pupils per classroom) and the pupil/teacher ratio. Each governorate was ranked according to its value on each of the two respective indicators in a relative manner. Then the average rank is taken to represent an index value for each governorate (named the Index of school quality). The index is tested against rates of dropout. We also tested the relationship between grade failure/repetition and dropout.

Figures 6 and 7 show the correlation between the dropout rates and the index of quality and grade failure/repetition rate. The figure 6 reveals a direct and significantly negative correlation between school quality and dropout rates. While no significant association is found between quality and repetition (graph not shown), we observe a direct significant and positive correlation between repetition and dropout, which may suggest that education quality may have an impact on reducing repetition.



The above results could also indicate that sustaining the on going demographic transition in Egypt hold a great promise for future benefits in the education sector. With the shrink in the basic level school age population due to declining fertility the demographic gift will materialize in terms of better school quality, at no cost of building more class rooms or recruiting more teachers. Thus, could save the nation a substantial waste of invest resources that could degenerate from dropouts.

Using child level data on dropout and grade failure/repetition in conjunction with other school quality related aspects (type of school attended) and learning (access to private tutoring and lessons), we attempt to examine the linkages between the quality and dropout.

Table 5 shows distribution of students by grade failure/repetition and school dropout, school type and access to private tutoring/lessons. The table shows that dropout rates are significantly four times higher among students who ever failed/repeated a grade, thus indicating that grade failure/repetition derive students to dropout. This result lend support to the finding obtained earlier from mother's own reports of reasons for dropout, that is grade failure/repetition is a reason behind school dropout. On the other hand, students who have access to private lesson and/or attend private schools are significantly less likely to fail/repeat a grade. These results may suggest that quality matters and that the quality of education in private schools is much better than in public and religious schools. However, as Table 5 shows, it is only the students of the rich who have the privilege of attending private schools and they are more likely to have access to private lessons.

**Table 5. Grade failure/repetition and school dropout, school type and private tutoring/lessons**

| Child status                                | Wealth Quintiles |            |            |            |                | Total | Ever failed/repeated a grade |      |
|---|------------------|------------|------------|------------|----------------|-------|------------------------------|------|
|   | Poorest<br>20%   | 2nd<br>20% | 3rd<br>20% | 4th<br>20% | Richest<br>20% |       | No                           | Yes  |
| <b>Dropped out</b>                          |                  |            |            |            |                |       |                              |      |
| No  | 90.3             | 91.0       | 93.4       | 97.0       | 98.6           | 93.1  |                              |      |
| Yes   | 9.7              | 9.0        | 6.6        | 3.0        | 1.4            | 7.0   | 4.4                          | 20.2 |
| <b>Had tutoring<br/>/private lessons</b>    |                  |            |            |            |                |       |                              |      |
| No  | 40.4             | 36.8       | 23.6       | 18.4       | 16.5           | 28.8  |                              | 23.5 |
| Yes   | 59.6             | 63.2       | 76.4       | 81.6       | 83.6           | 71.2  |                              | 15.1 |
| <b>School type</b>                          |                  |            |            |            |                |       |                              |      |
| Public                                      | 89.8             | 90.9       | 91.6       | 88.7       | 71.9           | 88.3  |                              | 18.0 |
| Private                                     | 0.1              | 0.4        | 0.9        | 7.4        | 25.4           | 4.5   |                              | 5.2  |
| Religious                                   | 10.1             | 8.7        | 7.5        | 3.9        | 2.7            | 7.2   |                              | 19.6 |
| <b>Ever<br/>failed/repeated a<br/>grade</b> |                  |            |            |            |                |       |                              |      |
| No  | 73.5             | 75.4       | 80.1       | 86.5       | 92.8           | 79.8  |                              |      |
| Yes   | 26.5             | 24.7       | 19.9       | 13.5       | 7.2            | 20.2  |                              |      |

Source: Author's calculations

Note: All differences are statistically significant at 1% or lower based on chi-square test.

## 6. Multivariate Analysis

Given the significant differences in patterns of girls schooling shown in earlier sections, and the need for designing gender specific policy recommendations we run multivariate analysis for girls and boys separately. We estimate each model twice, once excluding the community level variables and once again including a set of community level variables.

Table 6 shows the multilevel logistic model odds ratios estimates for the probability of never attending a school for children 8-15. In the Girls equation, the odds ratios of the girl's age show a cohort effect in the school never attendance trends, with the recent cohorts of girls being significantly more likely to attend school.

The household level of wealth shows a significantly negative association with the odds of a girl never attendance, thus reflecting significant vulnerability to exclusion from the education system among the girls of the poor. The significance of the wealth index in relation to girls' never attendance implies two facts: first, poor households may not be able to afford for monetary cost of education second, poor households may not afford substituting the forgone girls' time for schooling. The mother's autonomy index shows significantly negative associations with girls' school never attendance, thus reflecting the importance of mother's bargaining power in advocating for their girl's education. The girl's odds of never attending school decreases by 61% when the mother is most autonomous in the household decision making process. As expected, parental years of schooling significantly reduce the odds of a girl not to attend a school. Any additional year of schooling in parent's education contributes a round 25% reduction in the odds of a girl being never attending school. Household ownership of farm/land significantly increases the odds of a girl never attending school, indicating the value of the girl's time for uses other than schooling.

The significance of the variances of random effects at the household and community level indicate that there are significant unobserved influences on the probability of girls never attending school at both the household and community level. The influences at the community level still persist even after introducing a set of community level variables, though the variances shrink. The change in the log likelihood after introducing the community variables is significant, implying that the variables entered do have some significant influences. Among the community variables only the percent of father's in white-collar jobs shows to be significantly reducing the odds of girls never attending school. Only one-percent increase in the percent of fathers in white-collar jobs in the community can produce 5% reduction in the odds of girls never attending a school.

The insignificance that is observed for most of the regressors of the school never attendance in the boys' equation might suggest that the unobserved heterogeneity at the cluster level is perhaps masking the estimated standard error. We choose not to comment on more on it.

Table 7 shows the multilevel logistic model odds ratios estimates for the probability of dropping out of school. The odd ratios estimate for the child's age show that the likelihood of dropout is significantly lower before age 12 (age at which the primary stage is completed), but significantly increases thereafter at the preparatory stage. A child experience of grade failure/repetition significantly increases her/his odds of dropping out, with the girl's likelihood of dropout being more responsive as compared to boys. The results reassures the earlier findings obtained from mother's own reports of reasons for dropout.

Parent's years of education and household level of wealth are significantly protective against dropout. Whereas mother's autonomy (for the most autonomous 20%) is protective against dropout only for girls but not for boys.

The significance of the variances of random effects at the household and community level indicates that there are significant unobserved influences on the probability of dropout at both the household and community level. The influences persist even after the community variables are entered, except for the community influences in the girls' equation where the significance disappears implying that the community variables entered adequately accounted for the community influences. The cost of education per pupil at the community level appears to significantly increases the boys' odds of dropping out (at 10% level), whereas the percentage of mothers in white-collar jobs significantly reduces the odds of girls' dropout out.

Overall, the odds ratios in Table 7 reveal that girl's school dropout is more responsive to child age, household level of wealth, mother's autonomy, parent's education, child academic performance, and the unobserved heterogeneity at the household and community level.



**Table 6. Multilevel logistic model odds ratios estimates for the probability of never attending school (children 8-15), Egypt 2000**

| Individual and household variables                | Girls       |        |             |        | Boys        |         |             |         |
|---|-------------|--------|-------------|--------|-------------|---------|-------------|---------|
|   | Odds Ratios | S.E.   | Odds Ratios | S.E.   | Odds Ratios | S.E.    | Odds Ratios | S.E.    |
| <b>Age of child</b>                               |             |        |             |        |             |         |             |         |
| age 9   | 0.8764      | 0.3003 | 0.8718      | 0.2967 | 0.8179      | 0.5714  | 1.0316      | 0.7228  |
| age 10  | 1.2349      | 0.3974 | 1.2215      | 0.3901 | 0.8544      | 0.5513  | 1.0926      | 0.6916  |
| age 11  | 1.8233*     | 0.5882 | 1.7841**    | 0.5719 | 1.1629      | 0.7586  | 1.3862      | 0.8991  |
| age 12  | 3.1086***   | 0.9780 | 3.0693***   | 0.9584 | 3.1668**    | 1.8724  | 3.3445**    | 1.9778  |
| age 13  | 3.9271***   | 1.2599 | 3.8429***   | 1.2244 | 1.8140      | 1.1277  | 2.1580      | 1.3294  |
| age 14  | 5.0975***   | 1.6626 | 4.9483***   | 1.6047 | 1.9157      | 1.1784  | 2.4062      | 1.4940  |
| age 15  | 7.6936***   | 2.5394 | 7.8627***   | 2.5833 | 3.3934**    | 2.1042  | 3.6734**    | 2.2019  |
| <b>Household wealth level</b>                     |             |        |             |        |             |         |             |         |
| 2nd 20%   | 0.2929***   | 0.0697 | 0.3164***   | 0.0746 | 0.6482      | 0.3052  | 0.5754      | 0.2708  |
| 3rd 20%   | 0.0332***   | 0.0133 | 0.0380***   | 0.0149 | 0.2140**    | 0.1652  | 0.2010**    | 0.1390  |
| 4th 20%   | 0.0420***   | 0.0226 | 0.0588***   | 0.0311 | 0.6499      | 0.5048  | 0.3777      | 0.3206  |
| Richest 20%                                       | 0.0043***   | 0.0061 | 0.0067***   | 0.0096 | 0.3065      | 0.4437  | 0.1959      | 0.2954  |
| <b>Mother's autonomy</b>                          |             |        |             |        |             |         |             |         |
| 2nd 20%   | 0.5219**    | 0.1421 | 0.5093**    | 0.1376 | 0.5245      | 0.3022  | 0.6022      | 0.3312  |
| 3rd 20%   | 0.4047***   | 0.1268 | 0.4260***   | 0.1322 | 0.6205      | 0.3626  | 0.4939      | 0.2989  |
| 4th 20%   | 0.5755*     | 0.1701 | 0.5842*     | 0.1717 | 0.5156      | 0.3144  | 0.5149      | 0.3141  |
| Most autonomous 20%                               | 0.3947***   | 0.1158 | 0.4032***   | 0.1175 | 0.8776      | 0.4973  | 0.6386      | 0.3698  |
| <b>Residence (Rural)</b>                          | 1.7279      | 0.5847 | 1.0155      | 0.3482 | 0.9250      | 0.5126  | 0.7784      | 0.4271  |
| <b>Parent's education</b>                         |             |        |             |        |             |         |             |         |
| Mother's years of education                       | 0.7509***   | 0.0430 | 0.7762***   | 0.0437 | 0.9866      | 0.0773  | 0.9614      | 0.0845  |
| Father's years of education                       | 0.7167***   | 0.0265 | 0.7311***   | 0.0264 | 0.8433***   | 0.0535  | 0.8412***   | 0.0550  |
| Family has farm land                              | 1.8235***   | 0.4158 | 1.6920**    | 0.3817 | 1.1973      | 0.4733  | 0.9682      | 0.3975  |
| <b>Community variables</b>                        |             |        |             |        |             |         |             |         |
| Cost of education (Per pupil)                     |             |        | 1.0009      | 0.0007 |             |         | 1.0000      | 0.0014  |
| Percent of husbands in white color jobs           |             |        | 0.9511***   | 0.0098 |             |         | 0.9745      | 0.0158  |
| Percent of wives in white color jobs              |             |        | 0.9733      | 0.0192 |             |         | 1.0138      | 0.0310  |
| <b>Variances of random effects</b>                |             |        |             |        |             |         |             |         |
| Level (2): Household                              | 8.5016***   | 1.4446 | 8.3059***   | 1.4112 | 388.3168*** | 60.0649 | 100.3242*** | 16.0494 |
| Level (2): Community                              | 4.8095***   | 0.9211 | 4.1728***   | 0.8314 | 0.0000      | 0.000   | 0.0000      | 0.0002  |
| -2 Log-Likelihood                                 | 1889.817    |        | 1862.5179   |        | 1074.3143   |         | 1105.2283   |         |
| $\chi^2$ Statistic (Change in - 2 Log-Likelihood) |             |        | 27.2991     |        |             |         |             |         |
| d.f.  |             |        | 3           |        |             |         |             |         |
| P-value   |             |        | 0.0000      |        |             |         |             |         |



**Table 7. Multilevel logistic model odds ratios estimates for the probability of dropping out of school (children 6-15), Egypt 2000**

| Individual and household variables                | Girls       |        |             |        | Boys        |        |             |        |
|---|-------------|--------|-------------|--------|-------------|--------|-------------|--------|
|   | Odds Ratios | S.E.   | Odds Ratios | S.E.   | Odds Ratios | S.E.   | Odds Ratios | S.E.   |
| <b>Age of child</b>                               |             |        |             |        |             |        |             |        |
| age 6   | 0.0065***   | 0.0100 | 0.0068***   | 0.0107 | 0.0214***   | 0.0246 | 0.0230***   | 0.0258 |
| age 7   | 0.0318***   | 0.0289 | 0.0304***   | 0.0287 | 0.0480***   | 0.0338 | 0.0487***   | 0.0342 |
| age 8   | 0.0135***   | 0.0135 | 0.0126***   | 0.0137 | 0.0892***   | 0.0476 | 0.0919***   | 0.0487 |
| age 9   | 0.1597***   | 0.0855 | 0.1413***   | 0.0792 | 0.1477***   | 0.0595 | 0.1490***   | 0.0599 |
| age 10  | 0.1022***   | 0.0574 | 0.1034***   | 0.0602 | 0.2081***   | 0.0721 | 0.2105***   | 0.0726 |
| age 11  | 0.2884***   | 0.1315 | 0.3006***   | 0.1382 | 0.4963**    | 0.1410 | 0.4889**    | 0.1390 |
| age 13  | 1.8158      | 0.7062 | 1.7913      | 0.7112 | 1.5205*     | 0.3721 | 1.5229*     | 0.3703 |
| age 14  | 5.5390***   | 2.2270 | 5.7746***   | 2.4455 | 2.3769***   | 0.5743 | 2.3940***   | 0.5749 |
| age 15  | 15.3124***  | 7.0511 | 16.8370***  | 8.7841 | 4.2263***   | 1.0321 | 4.1862***   | 1.0139 |
| <b>Child's academic performance</b>               |             |        |             |        |             |        |             |        |
| Child failed/repeated a grade                     | 8.9663***   | 2.9028 | 9.7388***   | 3.5694 | 5.9020***   | 1.0278 | 5.8117***   | 1.0017 |
| <b>Household wealth level</b>                     |             |        |             |        |             |        |             |        |
| 2nd 20%   | 0.3530***   | 0.1180 | 0.3810***   | 0.1311 | 0.7331      | 0.1435 | 0.7515      | 0.1457 |
| 3rd 20%   | 0.2457***   | 0.0984 | 0.2854***   | 0.1165 | 0.4174***   | 0.1033 | 0.4181***   | 0.1030 |
| 4th 20%   | 0.1166***   | 0.0660 | 0.15859***  | 0.0905 | 0.2439***   | 0.0834 | 0.2547***   | 0.0869 |
| Richest 20%                                       | 0.2973***   | 0.2133 | 0.5513      | 0.4049 | 0.1686***   | 0.0957 | 0.1726***   | 0.0981 |
| <b>Mother's autonomy</b>                          |             |        |             |        |             |        |             |        |
| 2nd 20%   | 0.9101      | 0.3341 | 0.8715      | 0.3273 | 0.8500      | 0.2042 | 0.8727      | 0.2077 |
| 3rd 20%   | 0.6322      | 0.2515 | 0.6133      | 0.2542 | 1.0302      | 0.2536 | 1.0646      | 0.2596 |
| 4th 20%   | 0.8302      | 0.3164 | 0.8348      | 0.3263 | 0.8620      | 0.2129 | 0.8676      | 0.2132 |
| Most autonomous 20%                               | 0.2903***   | 0.1200 | 0.2681***   | 0.1176 | 0.7759      | 0.1911 | 0.8096      | 0.1977 |
| <b>Residence (Rural)</b>                          | 0.6949      | 0.2372 | 0.4695**    | 0.1702 | 0.3362***   | 0.0732 | 0.3342***   | 0.0749 |
| <b>Parent's education</b>                         |             |        |             |        |             |        |             |        |
| Mother's years of education                       | 0.8067***   | 0.0428 | 0.8307***   | 0.0469 | 0.8474***   | 0.0306 | 0.8538***   | 0.0307 |
| Father's years of education                       | 0.8696***   | 0.0310 | 0.8731***   | 0.0324 | 0.8684***   | 0.0206 | 0.8721***   | 0.0207 |
| Family has farm land                              | 1.2433      | 0.3676 | 1.1248      | 0.3363 | 0.9036      | 0.1721 | 0.8942      | 0.1684 |
| <b>Community variables</b>                        |             |        |             |        |             |        |             |        |
| Cost of education (Per pupil)                     |             |        | 0.9990      | 0.0009 |             |        | 1.0008*     | 0.0004 |
| Percent of husbands in white color jobs           |             |        | 0.9925      | 0.0100 |             |        | 0.9922      | 0.0062 |
| Percent of wives in white color jobs              |             |        | 0.9467***   | 0.0205 |             |        | 0.9941      | 0.0114 |
| <b>Variances of random effects</b>                |             |        |             |        |             |        |             |        |
| Level (2): Household                              | 10.0898***  | 3.3476 | 11.4419***  | 5.8435 | 3.8556***   | 0.8859 | 3.7112***   | 0.8590 |
| Level (2): Community                              | 2.5265***   | 0.9696 | 1.9051      | 1.1558 | 0.7451***   | 0.2836 | 0.6893***   | 0.2744 |
| -2 Log-Likelihood                                 | 1077.3721   |        | 1060.3114   |        | 1412.4929   |        | 1404.8743   |        |
| $\chi^2$ Statistic (Change in - 2 Log-Likelihood) |             |        | 17.0607     |        |             |        | 7.6186      |        |
| d.f.  |             |        | 3           |        |             |        | 3           |        |
| P-value   |             |        | 0.0001      |        |             |        | 0.0546      |        |

## **7. Concluding Remarks and Policy Recommendations**

### **7.1 Concluding Remarks**

This study investigates factors affecting children's education at the basic stage level in Egypt using data collected by the EGDH 2000. We base our work on Becker's theories of time allocation (1965) and comparative advantage (1991), as well as other empirical findings from the literature. We attempt to link work and schooling, but in a limited manner due to data requirements.

We show that despite the spectacular increase in basic education enrollments in Egypt, yet there are still challenges ahead before Egypt can achieve universal basic education, particularly for girls. Much need to be done in Upper Egypt and the Frontier governorates. In Matrou and Beni Suef, for example about 40 percent of girls never attended school, and in Fayoum and Assuit more than a quarter of girls never attended school. Whereas in Lower Egypt, Behera governorate is lagging behind, where more than 15% of girls have never attended school. However, we show that recent interventions led by the MOE and its collaborators from the local community and international donors have been successful in reaching the target of raising girls enrollments, particularly girls of the poor.

Data on mothers' reported reasons for school never attendance and dropout reveals that direct costs of education, the opportunity cost of child time, child disinterest in school, school proximity, customs and traditions, and poor academic performance are significant reasons barriers to children's education.

Our analysis of work and schooling reveals that children of poor households are significantly more likely to do work only or do work while attending school as compared to children of non-poor households.

Link between quality and dropout reveals that quality matter and that quality of education in private schools is much better than in public and religious schools. Access to private lessons significantly reduces the likelihood of failure and repetition. However, it is only the students of the rich who have the privilege of attending private schools and they are more likely to have access to private lessons.

Given the binary nature of our dependent variables (school never attendance and school dropout) we apply a three-level logistic model with random effects for households and community to control for the observed and unobserved heterogeneity at both levels. Our results show that, among the significant predictors of girls' never attendance are: age, household level of wealth, mother's autonomy, parents' education, household ownership of farm/land and the percentage of fathers in white-collar jobs in the community. Whereas the most significant predictor of children's dropout is the grade failure/repetition, in

addition to age, household level of wealth, mother's autonomy (for girls only), parents' education, percentage of mothers in white-collar jobs (for girls only) and cost of education per pupil in the community (for boys only).

## **7.2 Policy Recommendations**

In light of the above findings the following policy recommendations worth consideration:

- Raise school enrollments with particular emphasis on girls and the poor and the governorates that are lagging behind, namely Matrou, Beni Suef, Fayoum, Assuit, and Behera governorate. Interventions similar to the ones led by the MOE and the international donors are particularly encouraged.
- Improve quality of education to reduce repetition and dropout, particularly among boys.
- Remove stigma associated with low academic performance and recruit social workers for schools to help improve students' self esteem and confidence.
- Efforts are needed to change believes of the poor about the importance of girls education. Awareness raising campaigns and community outreach programs are most recommended.
- Facilitate the burden of direct and indirect costs of schooling for the poor by:
  - Compensate for the forgone use of child time in productive and gainful activities at farm/home by providing cash and/or in kind incentives (e.g. food rations or food stamps) to poor families, conditional upon sending their children to school, particularly girls.
  - Ease the financial burden of education on the poor by providing scholarships or tuition waiver and subsidized uniforms, books, and supplies.
- Build schools at accessible distance to the poor.
- The significance of the percent of parents with white-collar jobs in cluster reflects the importance of reducing unemployment among high school and university graduates so as to motivate children and their parents for attaining high levels of education.

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**Appendix A: Factor score coefficients of variables used in the principle component analysis of standard of living and woman role in household decisions making.**

| <b>Variable</b>   | <b>Factor score coefficient</b> |
|---|---------------------------------|
| <b>Standard of living index/wealth</b>                        |                                 |
| HV206 Has electricity   | 0.100                           |
| HV207 Has radio   | 0.132                           |
| HV208 Has television  | 0.123                           |
| HV209 Has refrigerator  | 0.171                           |
| HV210 Has bicycle   | 0.016                           |
| HV211 Has motorcycle/scooter                                  | 0.017                           |
| HV212 Has car/truck   | 0.064                           |
| MEMSLEEP Number of members per sleeping room                  | -0.080                          |
| H2OIRES If piped drinking water in residence                  | 0.167                           |
| H2OPUB If drinking water in public fountain                   | -0.101                          |
| H2OCTYRD If piped drinking water in courtyard                 | -0.032                          |
| H2OWELOR If drinking water from open well in residence        | -0.020                          |
| H2OWELOY If drinking water from open well in Yard             | -0.021                          |
| H2OWELOP If drinking water from open public well              | -0.045                          |
| H2OWELPR If drinking water from protected well in residence   | -0.066                          |
| H2OWELPY If drinking water from protected well in Yard        | -0.050                          |
| H2OWELPP If drinking water from protected public well         | -0.058                          |
| H2OSURF If drinking water from river or canal                 | 0.001                           |
| FLUSHTL If has modern flush toilet                            | 0.163                           |
| FLUSHTNK If has tank flush toilet                             | 0.008                           |
| FLUSHBUK If has bucket flush toilet                           | -0.106                          |
| TRADPIT If has traditional pit latrine                        | -0.066                          |
| LATBUSH If uses bush, field as latrine                        | -0.089                          |
| DIRTFLOO If has dirt, earth principal floor in dwelling       | -0.148                          |
| WOODFLOO If has wood, plank principal floor in dwelling       | 0.002                           |
| PRQTFLOO If has Parquet polished wood floor                   | 0.013                           |
| CRMCFLOO If has ceramic tiles floor                           | 0.046                           |
| CEMTFLOO If has cement tiles floor                            | 0.119                           |
| CMNTFLOO If has cement floor                                  | -0.067                          |
| CRPTFLOO If has Carpet  | 0.059                           |
| VINYFLOO If has Vinyl floor                                   | 0.019                           |
| <b>Woman Role in household decision making index</b>          |                                 |
| V743A Final say on own health care                            | 0.310                           |
| V743B Final say on making large household purchases           | 0.308                           |
| V743C Final say on making household purchases for daily needs | 0.312                           |
| V743D Final say on visits to family or relatives              | 0.322                           |
| V743E Final say on food to be cooked each day                 | 0.226                           |



**Appendix B: Summary statistic of the variables used in the multi-level logistic model**

| <b>Variable</b>  | <b>N</b> | <b>% or Mean</b> | <b>SD</b> |
|--|----------|------------------|-----------|
| Never attended school (%)                                  | 20622    | 11.18            | 31.51     |
| Dropped out (%)  | 18316    | 4.82             | 21.42     |
| Failed/repeated a grade (%)                                | 18255    | 13.90            | 34.60     |
| Household standard of living/wealth level                  | 20622    | -0.23            | 1.02      |
| Woman role in household decision making                    | 20622    | 0.03             | 0.99      |
| Rural residence (%)  | 20622    | 58.97            | 49.19     |
| Mother's Education (in single years)                       | 20622    | 4.05             | 5.40      |
| Father's Education (in single years)                       | 20619    | 5.90             | 5.84      |
| Household owns farm land (%)                               | 20622    | 26.67            | 44.22     |
| Cost of education per pupil (in Egyptian pound) in cluster | 20577    | 296.42           | 268.02    |
| % of father's who are white collar employees in cluster    | 20622    | 30.83            | 21.34     |
| % of mother's who are white collar employees in cluster    | 20622    | 10.63            | 13.58     |