

Evolving Time Use of Children Growing Up in Ethiopia, India, Peru and Vietnam, 2006-2016

Patricia Espinoza-Revollo and Catherine Porter



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Contents

The authors	4
Acknowledgements	4
Summary	4
1. Introduction	5
2. Data	6
3. Descriptive analysis	9
3.1. Age progression of work: school-age household members	9
3.2. Time allocation differences over 10 years: age progression of time spent in work and education in 2006	11
3.3. Time use of 15 year olds: looking at the Younger Cohort children	13
3.4. Comparison of 15 year olds in 2009 and 2016	17
3.5. Cohort and age effects	19
4. Conclusions	21
References	22

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Summary

Using detailed and comparable time-use data of children in four low- and middle-income countries, this working paper documents the evolution of their time spent on education, paid and unpaid work as they age from 5 to 15 years. Despite gendered differences in which tasks they undertake, total allocation of time to work (paid, unpaid and household chores) is not significantly different between boys and girls, except in India. Rural boys and girls work longer hours and spend less time in education at all ages in all countries, and differences in time use increase as the children age, driven mainly by those who leave school early. We compare our study cohort with an Older Cohort surveyed in 2009 at age 15 to document trends over time. Time spent on work has decreased quite strikingly in Peru and India, to a lesser extent in Ethiopia, and not at all in Vietnam. This has reduced inequality of time use to the advantage of rural girls in particular. Boys in rural Vietnam and Ethiopia are more likely to stop attending school by age 15, though in India the risk is higher for girls.

About Young Lives

Young Lives is an international study of childhood poverty, following the lives of 12,000 children in four countries (Ethiopia, India, Peru and Vietnam) over 15 years. www.younglives.org.uk

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1. Introduction

How children spend their time in low- and middle-income countries has drawn considerable policy debate and is often in the public eye – human rights activists have drawn attention to abusive and/or hazardous situations that some working children endure, and development agencies have highlighted the loss of education that working children may suffer. The elimination of child labour has also been an active international policy goal for several decades. It has now been incorporated into the Sustainable Development Goals that were ratified in 2016 by the United Nations. Specifically, Sustainable Development Target 8.7 calls for action to take immediate and effective measures to eradicate forced labour, modern slavery, human trafficking, and the worst forms of child labour, and by 2025 end child labour in all its forms. Relatedly, Goal 4 of the SDGs aims for ‘access to free, equitable, and quality primary and secondary education for all children’, and in particular Target 4.1 states that by 2030, ‘ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and Goal-4 effective learning outcomes’ (United Nations n.d.).

Much policy rhetoric has focused on eliminating child labour, and has built the momentum leading to the policy goals above. Most children in fact do not work in the worst forms of child labour - a small proportion work for pay, but the majority work within or for their own household, for no pay, and possibly for many hours (Webbink et al. 2012), which was until recently not considered as part of the definition of child labour.¹ Bourdillon (2010) frames the debate by discussing the importance of understanding children’s work in context, and emphasises that working can have both benefits and potential risks for children. Even if most children are not in hazardous work, understanding how they allocate their time is useful in its own right for the same reasons that adult labour supply is of interest to researchers (Edmonds 2008; Gimenez-Nadal and Sevilla 2012). Understanding the time use of children within the context of the household and over time as they grow up will improve our understanding of individual and household behaviour, as well as help us examine the economic decision-making processes of households and understand how and when gaps in educational investments emerge. In this study we define children’s work as being that which is paid or unpaid, outside the home, on the family/household farm or enterprise, and chores or tasks inside the home, including time spent caring for others. Our research is complementary to the strand of literature which attempts to document the causal effect of child labour on adult outcomes (Emerson et al. 2017).

Ethiopia is the poorest country in the sample, a low-income country and one of the poorest in Africa, and has the lowest levels of school enrolment and achievement. India, Peru and Vietnam are all classified as middle-income countries, though Vietnam stands out for high performance on international education achievement tests and high productivity of schooling (Singh 2015). Sanchez and Singh (2018) document enrolment rates in these three countries using national data and find that children tend to leave school earlier in India than the other two countries, with a gender bias against girls. Vietnam, on the other hand, sees more boys leaving school early.

¹ The 18th International Conference of Labour Statisticians proposed the inclusion of such unpaid domestic work as part of a definition of children’s work (International Labor Organisation 2008).

In terms of policy background, all four countries have now ratified international policy conventions on child labour.² The states of Andhra Pradesh and Telangana in India, in particular, have had a very striking campaign against child labour (Saharia 2013). In Ethiopia, India and Peru the minimum age for working is 14, and it is 15 years old in Vietnam. The official age to start primary schooling is 7 years in Ethiopia and 6 in the other three countries. Elementary schooling lasts for five years in Peru, six years in Vietnam and eight years in India. In Ethiopia there are two 'cycles' akin to a middle school system, from age 7 to 10 years and 11 to 14 years. Secondary education in Ethiopia has two phases, from 15 to 16 years and from age 17 to 18 years, making 12 years up to the (final) school-leaving exams, the same as in India and Vietnam, with Peru having 11 years.

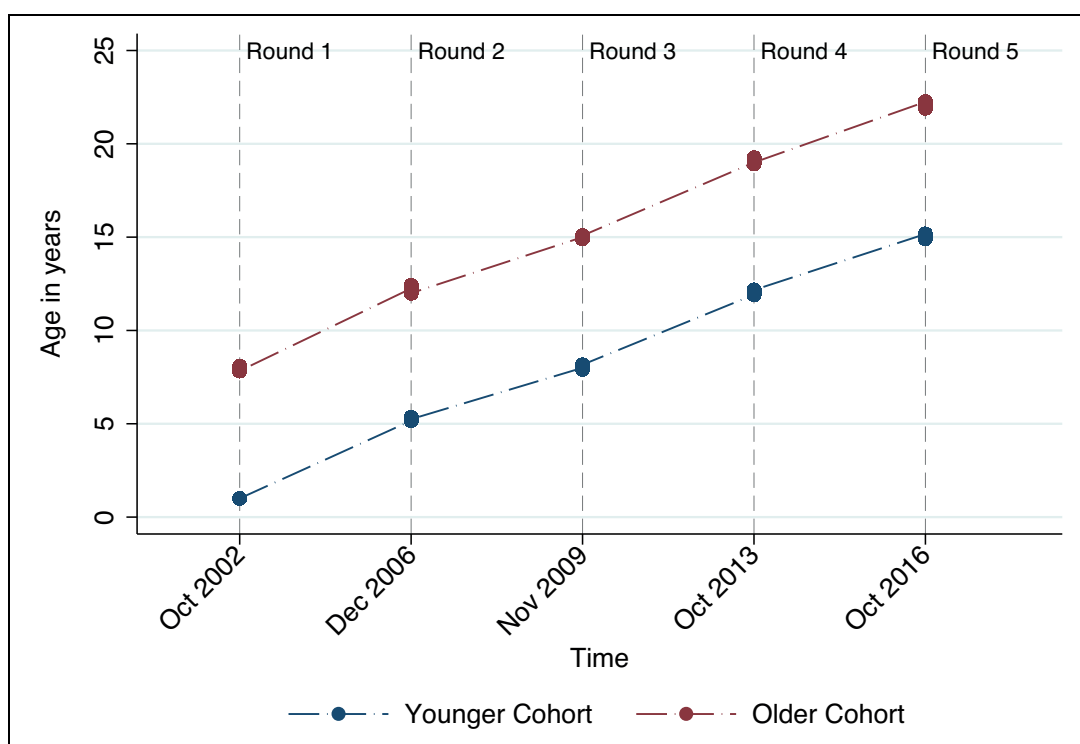
The rest of the paper proceeds as follows. We present the dataset in Section 2, followed by descriptive analysis in Section 3 on the patterns of time use that emerge at age 15 and how these differ across wealth, gender and location. We also consider gaps that emerge in earlier ages, and how these have evolved over the time observed. Next, we compare the time use of our focus cohort (the Younger Cohort in Young Lives) with that of an Older Cohort of children, who are seven years older than them. These children were surveyed in 2009, when they were also aged 15. We consider that the combination of several different analyses can offer a more comprehensive picture of the factors which influence the time use of the 15-year-old children. Our final section concludes.

2. Data

To explore the evolving time use of children we use data from Young Lives, a unique longitudinal study following 12,000 children living in four countries (Ethiopia, India, Peru and Vietnam) over 15 years, with five rounds of data collection to date. The surveys cover two cohorts; a Younger Cohort of about 8,000 children (2,000 per country) born in 2001-2, and an Older Cohort of about 4,000 children (1,000 per country) born in 1994-5. The surveys gathered data from children from both cohorts at similar age points with a time lag (see Figure 1), thus allowing the possibility of inter-cohort comparisons; for example, comparing the Younger Cohort at age 15 in 2016 with the Older Cohort also age 15 in 2009.

² In particular, Convention 138 on minimum age for work and Convention 182 outlawing the worst forms of child labour. Note that in India they were not ratified until recently; both came into force on 18 June 2018.

Figure 1. *Ages of Young Lives children by survey round*



The data are clustered in about 20 sites spread across rural and urban areas in Ethiopia, India (the states of Andhra Pradesh and Telangana) and Vietnam, and in 80 sites in Peru. The selection of sites followed a purposive sampling strategy which led to a relative oversampling of poorer households. Thus the data are not nationally representative. However, careful comparison with national indicators shows that the data reflect the geographical and demographic diversity found in nationally representative surveys (Barnett et al. 2012; Escobal and Flores 2008; Nguyen 2008; Outes-Leon and Sanchez 2008).³ Attrition rates are relatively low considering the whole study period, especially for the Younger Cohort. Since the first round of data collection in 2001, the attrition rate for the Younger Cohort has been 4.9 per cent and 12 per cent for the Older Cohort; the latter's peaking between 2013 and 2016 (i.e. between the ages of 19 and 22).

Table 1. *Attrition rates over five rounds of data collection (2001-16)*

Country	Younger Cohort 15 years (%)	Older Cohort 22 years (%)
Ethiopia	5.3	17.7
India	3.7	7.6
Peru	8.2	14.1
Vietnam	2.5	8.6
Total	4.9	12.0

Source: Young Lives 2018.

³ The sample does not cover children who were not part of a household at the time of sampling (i.e. street children, or those in institutions).

We take advantage of the fact that since 2006 the study has collected detailed time-use information for the sample children as well as all other children aged 5 to 17 living in their households. The data also include extensive child, household and community-based information. To the best of our knowledge, this is the only panel dataset covering a long age range, multiple countries, comparable time-use information, and with extensive early life background information to explore the evolving nature of time use during childhood in low- and middle-income countries (LMICs) and the influences that shape this process.

The set of questions about time use collected in the survey refers specifically to a typical day (during weekdays and when school was in session) in the last week.⁴ Children and caregivers were offered 24 pebbles/seeds to be placed into eight cups/circles illustrating different activities, including: school and study outside of school (which we classify as time spent in education); a range of tasks that children undertake within and outside their households; such as caring for other people in the household, household chores, working at home (on the family farm or business), and working for pay outside the household – all of which we classify into time spent working; and finally leisure and sleeping. A couple of caveats to note on this definition of time use ‘on a typical day in the last week’ mean that it does not capture seasonality. Also, focusing on weekdays may underestimate the amount of time children work, as some work may take place during weekends.⁵ However, the survey was undertaken at similar times of the year in each round, thus making comparisons over time possible.

Based on this information, our key variables are time spent per day in work and in education, focusing primarily on the Younger Cohort children. When these children were 5 and 8, time-use information was reported by their main caregivers. From age 12, children self-reported their time use. But how much does it matter who does the reporting? Table 2 shows hours per day worked as reported by the Younger Cohort sample children at age 15 (in 2016) and by their caregivers, alongside with their p-values of the difference in means between both reports. Children from every country report larger amounts of time spent on work than their caregivers. In terms of education, the results are mixed. In Peru and Vietnam, children report spending less time studying than caregivers report, and in India, children report spending more time studying. No significant differences are observed in Ethiopia (confirming earlier results from Heissler and Porter (2013)). However, though most of these differences are statistically significant, the magnitudes are very small. Taking the example of time spent working in Peru – which has the largest difference between caregivers’ and children’s reports – the difference is equivalent to 10 minutes on average.

4 If the last week was not a typical week (e.g. there were celebrations, holidays, etc.) respondents were asked to refer to the last typical week.

5 Note also that in Peru the approach was slightly more flexible, in that it was also possible to count more than 24 hours if the child was doing more than one activity at the same time, for example, housework and caring for a younger sibling. In practice, the total time in Peru is in a range between 22 and 26 hours.

Table 2. *Caregiver versus child reported hours at age 15*

	Caregiver	Younger Cohort child	Difference	p-value
Work				
Ethiopia	4.48	4.53	-0.06	0.09
India (AP)	2.09	2.20	-0.11	0.00
Peru	2.37	2.54	-0.17	0.00
Vietnam	3.01	3.14	-0.12	0.00
Education				
Ethiopia	7.21	7.19	0.02	0.48
India (AP)	9.84	9.93	-0.09	0.01
Peru	9.00	8.93	0.06	0.08
Vietnam	7.75	7.61	0.14	0.00

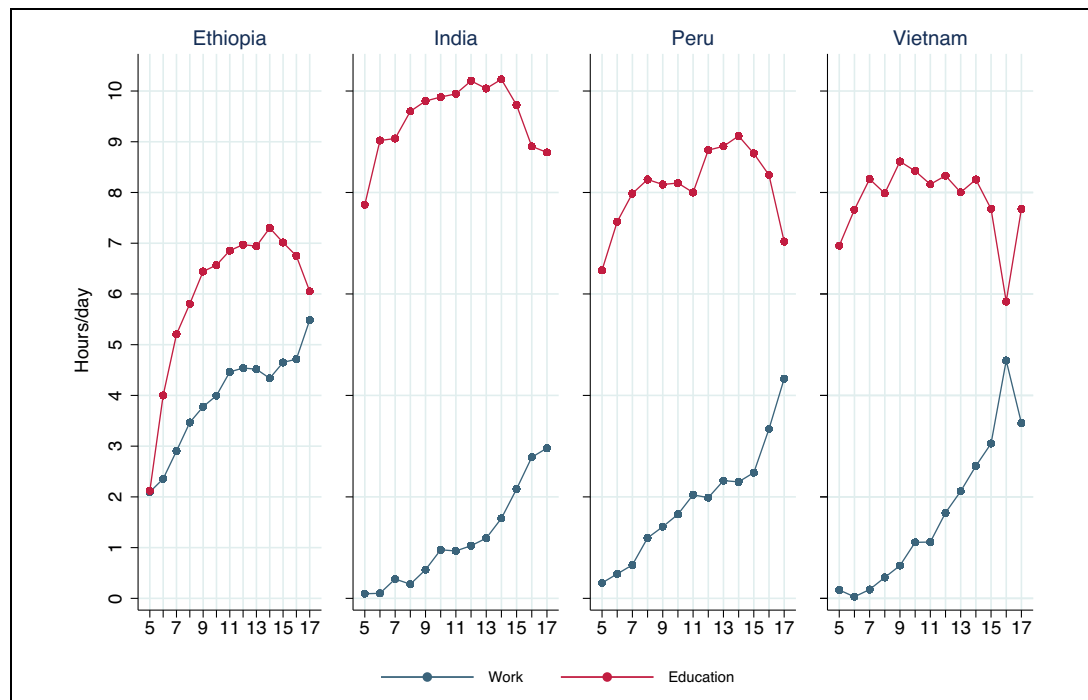
In addition, also since 2006, caregivers were asked to report the time use of all school-aged children (ages 5 to 17) living in the Younger Cohort sample children's households following the same eight-activity classification. Although the focus of this study is on the Younger Cohort children, we use time-use information of all the school-aged children and of the Older Cohort children at age 15 (in 2009) to examine age progression and inter-cohort (i.e. temporal) changes in time spent on education and work.

3. Descriptive analysis

3.1. Age progression of work: school-age household members

We begin by using the information on the full set of school-aged household members, aged 5-17, in 2016 to see the evolution of the age-progression in hours spent on education and work. Noting that work includes all kinds of work (household chores, caring for others, work in household farm or business, and paid work outside the household), we see that Ethiopian boys and girls work much more than children in the other countries at all ages. Ethiopian children start working from an early age – even at age 5 the average hours worked per day is two, which is equivalent to the amount of work of 15 year olds in the other countries. Time spent in work increases steadily and plateaus between the ages of 10 and 14, then increases again as children stop attending school either permanently or temporarily (mirrored by a corresponding fall in education hours).

Figure 2. *Work and education across the four countries, 2016*



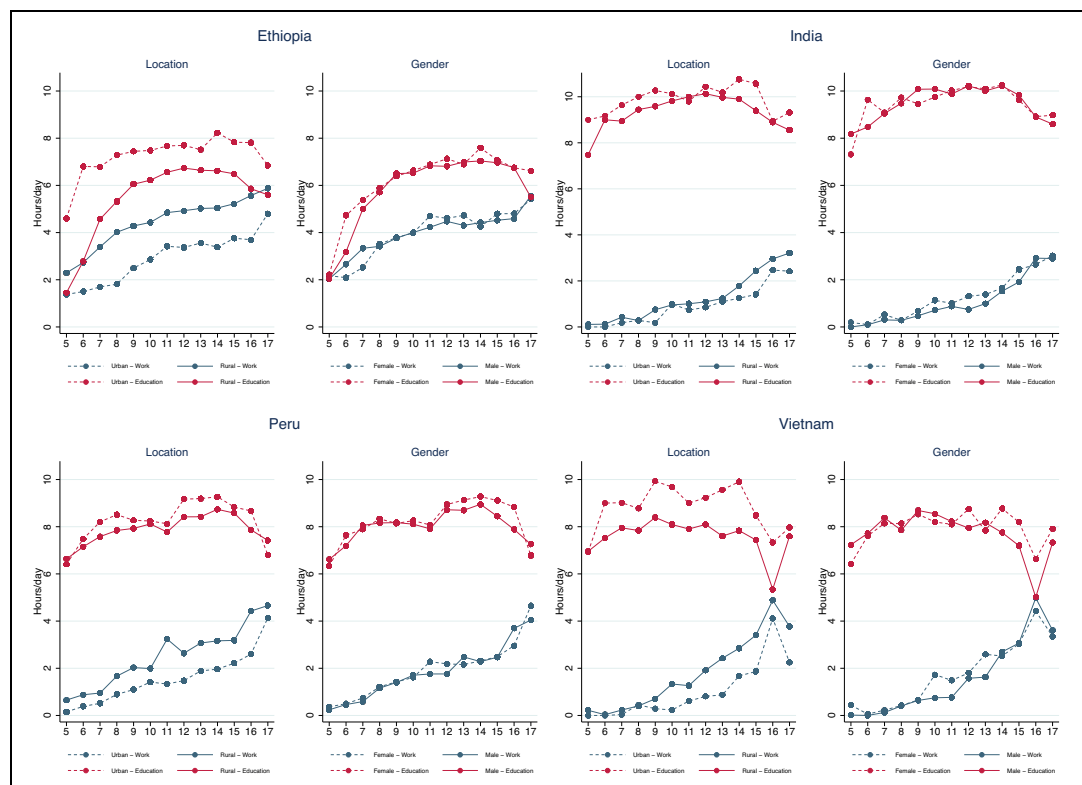
In the three other countries, the age progression of working hours is fairly similar, very low below the age of 10 and increasing more steeply thereafter. Note, for example, that by the age of 12 the average child in Vietnam is still working fewer hours than a 5-year-old Ethiopian child. India has the fewest working hours of the four countries, and the highest number of hours spent on education, perhaps a consequence, as mentioned earlier, of the very striking campaign against child labour in the states of Andhra Pradesh and Telangana (Saharia 2013). However, a caveat to this finding is that we cannot differentiate between reporting bias (i.e. fear of parents being sanctioned) and actual work (true programme impacts).

In all countries we see a hump-shape in the hours spent in education which reflects the proportion of children that are enrolled in school (see below for further discussion). For younger children, becoming older is associated with an increase in both education and working hours (and less leisure). However, in later childhood and early adolescence, time spent on education and work appear to be substitutes for each other – those who work longer hours spend less time on education (and vice versa).

Differences between urban and rural locations are striking. Figure 3 shows gaps between urban and rural time use in the left-hand panels for each country. In Ethiopia, at all ages, children who live in urban areas spend significantly fewer hours working and more hours studying than children living in rural areas. In rural Ethiopia the ratio of amount of time studying and working is close to 1:1. In Vietnam, from age 6 – which coincides with the official age to start school – children in urban areas spend considerably more time in education than their rural counterparts. However, significant differences in time spent in work only start appearing at age 10, when children in rural areas find themselves working more than urban children. In Peru, children of all ages in rural areas also work significantly more than those in urban areas. Even though there are gaps for time spent on education, they are not as big as those for work. Location gaps are less evident in India: children in rural areas

do not necessarily work more than children in urban areas. For education, the urban-rural gaps are very small at all ages.

Figure 3. *Work and education according to location and gender, 2016*



Surprisingly, gender differences are not significant when considering the aggregate measure of work or education. Time spent working by boys and girls is not significantly different at all ages in any of the four countries. The situation is similar for education, with the only exceptions of Peru and Vietnam, where girls spend more time on education than boys from age 14. Previous studies, however, provide evidence that the composition of work is highly gendered with girls working mainly on domestic tasks (cooking, cleaning, fetching water, etc.) and boys on the household farm (Heissler and Porter 2013; Crivello and Espinoza–Revollo 2018). We examine gender and location differences in more detail below, focusing on the Younger Cohort children.

3.2. Time allocation differences over 10 years: age progression of time spent in work and education in 2006

Focusing on the children age 5 to 17 living in the households at the time of the Round 2 survey allows us to examine the way children distributed their time 10 years earlier when the sample children were 5 years old.⁶ Figure 4 shows that children in all four countries not only spent less hours per day in school and studying in 2006 than in 2016, but also that they started dropping out from school at a younger age – as shown by the change in the slope of

⁶ Given that the information is restricted to children age 5 to 17, in 2006 we miss children who are younger than the sample children and include older siblings who might not be included in the 2016 if they are older than 17. Also, the comparison is not strictly for the same households as they may have changed (e.g. a child moving alone to a different household).

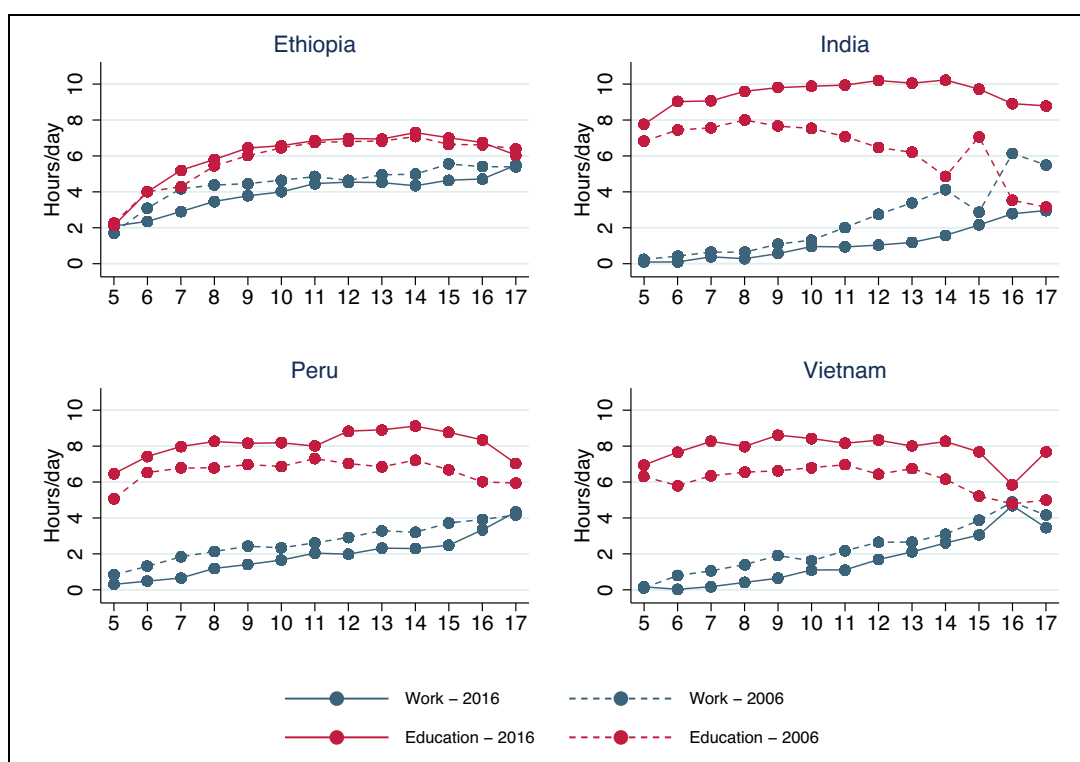
the education curve. Among the four countries, India has changed the most over the past 10 years; even at age 5, children spend one extra hour in education in 2016 than they did 10 years earlier. The difference increases gradually with age, reaching a maximum at age 14 with about five hours of difference. In addition to spending more time in school, Indian children are staying in school longer, as they have pushed back the leaving age from the age of 10 to 14. Also, time spent working has decreased dramatically in the last 10 years, especially for children age 10 and over. Note, for instance, that at age 11, children worked almost double the amount in 2006 than children of the same age did in 2016.

In Peru, the story is somewhat similar: time in education has increased and time in work has decreased for children at all ages between 2006 and 2016, but the magnitudes are less striking than in India. It is noteworthy that time in education shows a growing gap from the age of 12 – this age coinciding with the beginning of lower secondary education in Peru's education system. This suggests that more children are continuing their education onto this level in 2016 than 10 years earlier. The slope for both curves, however, changes downwards from age 14 – the age that coincides with the transition to upper secondary – suggesting that this was and still is a critical grade at which children leave school. In terms of work, there is a consistent gap (i.e. decrease) of about one hour on average of time spent working in 2006 and 2016.

Time in education in Vietnam has increased at a similar magnitude at all ages. The change in the slope of the curve suggests that children are staying on at school a little longer. Similarly, time spent working has decreased for all ages, but to a lesser extent than the increase in time spent in education.

Among the four study countries, Ethiopia has changed the least in the past 10 years. Though very small, the greatest changes in time spent in education and working happen for the younger children. The increase in time spent on education at age 7 suggests that more children are enrolling in education at the right age.

Figure 4. *Work and education in 2006 and 2016*



3.3. Time use of 15 year olds: looking at the Younger Cohort children

We now focus on the sample children. Table 3 shows the hours spent on a typical day on different activities at age 15 (in 2016). Mirroring the findings from our previous analysis, the numbers show that children in Ethiopia work the longest hours (about 4.6 hours/day) and spend the least time in education (7.2 hrs/day). Children in India, on the other hand, spend the longest hours in education (about 10 hrs/day), and work the least hours (2.2 hrs/day) at age 15. Children spend similar amounts of time in leisure activities (about 3.5 hrs/day) in all countries, except for Vietnam where the average amount of time spent on leisure is 4.7 hours per day.

Also in line with previous results, Table 3 shows that gender differences in the time spent working are not significant, except for in India, where girls work 0.4 hours per day more than boys. Location, however, shows important gaps: children in rural areas work significantly more than those in urban areas in all study countries. The previous analysis suggested a substitution effect between the amount of time children spent on education and work. We explore this for the sample children by tabulating the amount of time children attending school also work. The difference in the time spent working is significant in all countries, and particularly striking in India, where children not attending school work on average 9 hours, which is 7.7 hours more than those attending school. Though out-of-school children in Ethiopia work a similar amount of time (9 hours) the difference in relation to children attending school is 5 hours per day, suggesting that 15 year olds in Ethiopia juggle schooling with about 4 hours work per day.

Table 3. *How 15 year olds spend their day (hrs/day)*

	Ethiopia		India		Peru		Vietnam	
Work	4.6		2.2		2.5		3.2	
Education	7.2		9.9		8.9		7.6	
Leisure	3.4		3.6		3.5		4.7	
Sleeping	8.9		8.3		8.7		8.5	
Work								
By gender								
Girls	4.5		2.4		2.5		3.2	
Boys	4.6		2.0	**	2.5		3.2	
By location								
Urban	3.6		1.5		2.3		2.1	
Rural	5.3	***	2.5	***	3.1	***	3.5	***
By enrolment								
Yes	4.1		1.3		2.4		2.1	
No	9.2	***	9.0	***	6.8	***	7.6	***

Notes: *** p<0.01, ** p<0.05, * p<0.1.

It is clear that one of the main factors influencing how 15 year olds spend their time is whether or not they are in school. While the majority of children in all four countries are still attending school at 15, they were more likely to be in school in 2013, when they were 12 years old, indicating that a growing number have stopped attending. Table 4 shows the enrolment of the children at ages 5, 8, 12, and 15, by girls and boys and for urban and rural locations.⁷ Rates vary substantially across countries, location and gender, but what is common among the four countries is that enrolment peaks at age 12, Peru being the only country that reaches almost full enrolment at this age.⁸

7 Enrolment is defined by whether or not the child was attending school at the time of the survey.

8 Note that enrolment at the age of 5 captures enrolment in pre-school.

Table 4. *Sample children enrolment rates*

	5 years old (2006)	8 years old (2009)	12 years old (2013)	15 years old (2016)
Ethiopia				
Total	1.5	65.6	94.0	91.4
Gender				
Boys	1.0	64.0	92.2	89.6
Girls	1.9	67.2	95.8**	93.4**
Location				
Rural	1.2	53.3	90.9	88.5
Urban	1.9	84.0***	98.3***	95.5***
India				
Total	21.8	93.5	96.3	87.9
Gender				
Boys	19.8	91.7	96.4	89.4
Girls	24.2*	95.7***	96.3	86.1*
Location				
Rural	24.7	92.6	96.0	85.7
Urban	13.1***	96.1**	97.6	92.6***
Peru				
Total	1.0	94.2	99.2	96.9
Gender				
Boys	1.3	94.9	99.3	96.4
Girls	0.7	93.6	99.1	97.5
Location				
Rural	0.5	98.6	99.4	95.5
Urban	1.3	98.6	99.2	97.4*
Vietnam				
Total	83.0	98.1	96.8	80.7
Gender				
Boys	83.4	97.9	96.3	77.4
Girls	82.7	98.4	97.3	84.1***
Location				
Rural	81.8	97.8	96.2	78.2
Urban	87.9**	99.2	99.2**	89.7***

Notes: *** p<0.01, ** p<0.05, * p<0.1.

Late enrolment in Ethiopia partly explains the low enrolment rate (65 per cent) observed at age 8 in relation to the other countries. By age 15 many children have left school, with the greatest decrease in enrolment being in Vietnam, from nearly 97 per cent at age 12 to about 81 per cent at age 15. A plausible explanation for this decrease is that the ages of 14 and 15 mark an important transition into lower secondary education in Ethiopia and India, and to upper secondary education in Peru and Vietnam, according to what is stipulated by their education systems; at which point children may opt to leave school, find that higher levels of education are not available in their communities, or fail to pass qualifying exams.

Urban 15 year olds are much more likely to be in school in all four countries. Surprisingly perhaps, girls are also more likely than boys to be in school at age 15. More than 97 per cent of Peruvian and Ethiopian young women are attending school. This compares with fewer than three-quarters of Vietnamese boys in rural areas. Almost half of those who stopped attending school in Vietnam said that it was because they were suspended for being away too long. Enrolment rates also fall sharply in India, from 96 per cent to 88 per cent

between the ages of 12 and 15, respectively. In this case, however, girls are less likely than boys to be enrolled in school. Evidence from the Older Cohort shows that girls who had left school by age 15 were four times more likely to experience child marriage than girls who were still enrolled at this age (Roest 2016).

Looking at how enrolment intersects with gender and location differences in terms of time spent working, Table 5 shows the combination of these variables for the four countries. Boys who are not in school work significantly more than girls. However, for those in school the gender differences are not significant. Children in rural areas, whether in or out of school, work significantly more hours than children in urban areas.

Table 5. *Working time by children in and out of school (hrs/day)*

	Ethiopia		India		Peru		Vietnam	
	In school	Out of school	In school	Out of school	In school	Out of school	In school	Out of school
By gender								
Girls	4.2	8.9	1.4	8.9	2.5	6.1	2.2	8.2
Boys	4.0	9.4	1.2	9.1	2.4	7.3	2.0	7.3
By location								
Urban	3.3	8.3	1.1	6.8	2.2	6.4	1.5	6.7
Rural	4.7	9.5	1.4	9.4	2.9	7.5	2.3	7.8

Finally, we explore the aggregate for time spent working. As noted previously, differences in the amount of time boys and girls work are not significant, except when children are not enrolled in school. However, the pattern seems to be different when looking into the specific activities within this aggregate. Table 6 shows the difference in means for the time spent on each work activity (and the overall work aggregate) and the participation rates for both boys and girls.⁹ It shows a clear division of labour, with girls not only participating significantly more than boys in caring and household chores/domestic activities, but also spending more time on these activities overall. On the other hand, boys participate at a higher rate and spend more time in activities related to unpaid work in the household farm or business, and in paid work outside the household, although these are not significantly different than that of girls in India and Vietnam. Table 6 also highlights the importance of household chores, where children, boys and girls, participate widely.

As the figures in the table reflect the average amount of time spent on different activities by all 15-year-old boys and girls in the Younger Cohort sample, they conceal the real workload for children who do perform the different activities. Taking into account only those who spent one hour or more in the activities shows that paid work is where children spent most time. While participation rates are still low – the highest being in Vietnam with 8 per cent – for those children who are working for payment outside their households, the amount of time they spend working on a typical day surpasses five hours in Peru and Ethiopia, and eight hours in India and Vietnam. Participation rates in activities related to the household business or farm varies widely across the four countries but in all of them, except Vietnam, is the second most important activity in terms of time spent. In India, children who perform this activity spend on average more than four hours per day.

⁹ Participation rates consider those who spend at least one hour in any of the given activities.

Table 6. *Time spent and participation in different work activities by gender, 15 year olds*

	Ethiopia			India			Peru			Vietnam		
	Male	Female	Diff	Male	Female	Diff	Male	Female	Diff	Male	Female	Diff
Caring for others												
Time spent	0.38	0.68	-0.31***	0.12	0.25	-0.13***	0.67	0.71	-0.04	0.27	0.41	-0.14***
Participation	0.24	0.39	-0.15***	0.10	0.17	-0.07***	0.37	0.37	0.00	0.16	0.23	-0.07***
Household chores												
Time spent	1.54	2.94	-1.40***	1.00	1.41	-0.41***	1.20	1.44	-0.24***	1.25	1.48	-0.23***
Participation	0.82	0.97	-0.16***	0.72	0.80	-0.08***	0.83	0.87	-0.05**	0.81	0.88	0.07***
Farm/hh business												
Time spent	2.28	0.76	1.52***	0.39	0.28	0.11	0.41	0.30	0.11*	0.91	0.65	0.26***
Participation	0.59	0.32	0.27***	0.12	0.05	0.07***	0.17	0.13	0.04*	0.35	0.27	0.08***
Paid work												
Time spent	0.38	0.15	.23***	0.52	0.44	0.08	0.26	0.09	0.16**	0.75	0.62	0.13
Participation	0.06	0.02	0.03***	0.06	0.05	0.01	0.04	0.03	0.01	0.09	0.08	0.01
Work (overall)												
Time spent	4.57	4.54	0.03	2.03	2.38	-0.35*	2.53	2.54	-0.01	3.18	3.16	0.02
Participation	0.96	0.99	-0.03***	0.75	0.81	-0.07***	0.89	0.89	-0.01	0.89	0.91	-0.02

Notes: *** p<0.01, ** p<0.05, * p<0.1.

3.4. Comparison of 15 year olds in 2009 and 2016

How has time use changed in relation to the 15 year olds whose work and education hours were measured seven years previously? Here we focus on the Older Cohort children when they were 15 years old in 2009 and examine changes in time use for different groups: boys and girls, urban and rural, and a combination of these two (Table 7).

In all countries, except Vietnam, time devoted to working by 15 year olds has decreased significantly for both boys and girls and in rural and urban areas. Notably, time spent working has fallen more in rural areas than in urban areas, especially in Peru where 15 year olds in 2016 spend about two hours per day less working than did 15 year olds in 2009. Similarly, girls work significantly fewer hours by 2016, with the decrease being more pronounced than that for boys. By 2016, the time that 15-year-old girls living in rural areas spent working had fallen more than that of rural boys of the same age. Indeed, time spent working has not changed for rural boys in India. This could point to a higher value for the work done by boys in rural areas. In urban areas, the story is very similar: 15-year-old girls do fewer hours of work in 2016 than in 2009 and the decrease is more than that for 15-year-old boys. Again, there are no significant changes in the amount of work urban boys did in 2009 and in 2016 in Ethiopia and India.

Time spent on education, on the other hand, has increased significantly in India and Peru, with girls in India increasing their time in education the most (by almost two hours) in relation to 15-year-old girls in 2009. The data also show that girls and boys in India and Peru are working fewer hours per day, signalling a trade-off effect. In parallel with increasing time spent on education, learning levels (proxied by mathematics test scores) of 15 year olds in 2016 show improvement as compared to 15 year olds in 2009, though we do not attribute any causality to this finding (Pritchett 2013).

Notably, in Ethiopia, 15 year olds in 2016 study and go to school virtually the same number of hours as 15 year olds in 2009 but, as noted previously, they also work fewer hours. This

suggests that 15-year-old boys and girls in 2016 have more time for sleeping and leisure activities in relation to their age peers in 2009. In Vietnam, time on education increased slightly in relation to seven years earlier, although the differences are not significant (the combined total sample difference has only increased by 0.3 hours per day).

Table 7. *Changes in time spent working for 15 year olds*

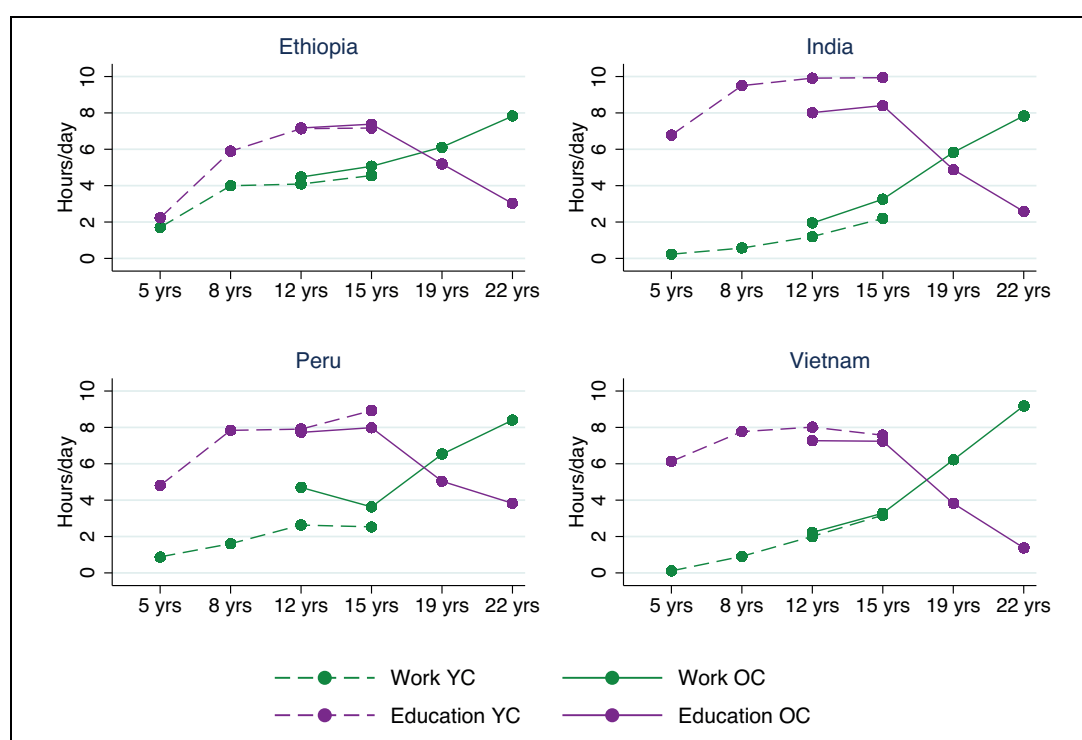
	Work			Education		
	2009	2016	Diff	2009	2016	Diff
Ethiopia						
Total	5.1	4.6	0.5***	7.4	7.2	0.2
Urban	3.9	3.6	0.3*	8.3	8.0	0.3
Rural	5.9	5.3	0.6***	6.7	6.6	0.2
Girls	5.2	4.5	0.6***	7.6	7.4	0.2
Boys	5.0	4.6	0.4*	7.2	7.0	0.2
Urban girls	4.1	3.8	0.4*	8.4	8.2	0.2
Urban boys	3.6	3.4	0.3	8.2	7.9	0.3
Rural girls	5.9	5.1	0.8***	6.9	6.8	0.1
Rural boys	5.9	5.4	0.5**	6.5	6.4	0.2
India						
Total	3.3	2.2	1.1***	8.4	9.9	-1.5***
Urban	2.1	1.5	0.6**	9.5	10.8	-1.3***
Rural	3.6	2.5	1.1***	8.1	9.6	-1.5***
Girls	4.0	2.4	1.6***	7.9	9.9	-2.0***
Boys	2.5	2.0	0.5**	8.9	10.0	-1.1***
Urban girls	2.3	1.5	0.8***	9.3	10.7	-1.4***
Urban boys	1.8	1.4	0.4	9.7	10.8	-1.1**
Rural girls	4.4	2.7	1.7***	7.5	9.5	-2.0***
Rural boys	2.7	2.3	0.4	8.7	9.6	-0.9***
Peru						
Total	3.6	2.5	1.1***	8.0	8.9	-0.9***
Urban	3.3	2.3	0.9***	8.3	9.0	-0.7***
Rural	4.9	3.1	1.8***	7.0	8.6	-1.7***
Girls	3.8	2.5	1.3***	8.3	9.1	-0.8***
Boys	3.5	2.5	0.9***	7.7	8.7	-1.0***
Urban girls	3.5	2.4	1.1***	8.6	9.2	-0.5**
Urban boys	3.0	2.3	0.8***	8.0	8.9	-0.9***
Rural girls	4.8	2.9	1.9***	7.3	9.0	-1.6***
Rural boys	4.9	3.3	1.6***	6.7	8.3	-1.7***
Vietnam						
Total	3.3	3.2	0.1	7.2	7.6	-0.3*
Urban	2.0	2.1	-0.1	8.2	8.4	-0.2
Rural	3.6	3.5	0.1	7.0	7.3	-0.3
Girls	3.3	3.2	0.1	7.7	8.1	-0.4
Boys	3.3	3.2	0.1	6.8	7.1	-0.3
Urban girls	2.0	2.0	0.0	8.9	9.0	-0.1
Urban boys	2.0	2.2	-0.2	7.6	7.9	-0.2
Rural girls	3.6	3.5	0.1	7.4	7.9	-0.4
Rural boys	3.6	3.5	0.1	6.5	6.8	-0.3

Notes: *** p<0.01, ** p<0.05, * p<0.1.

3.5. Cohort and age effects

Figure 5 presents a more extensive comparison of the Younger and Older Cohort at ages 12 and 15. This exercise is particularly useful to examine: (1) whether certain gaps in time spent working might have opened up, remained, or closed in the seven years that separate these two cohorts; and (2) allows us to distinguish between cohort and age effects.

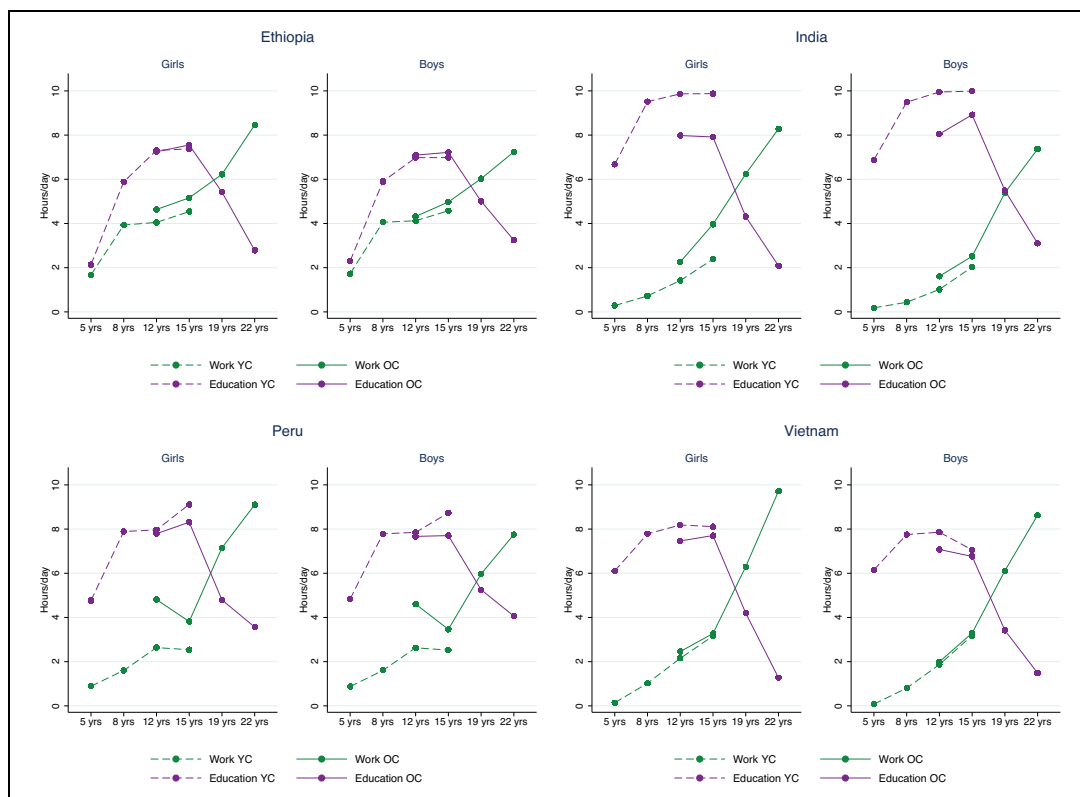
Figure 5. *Time spent on work and education by Younger and Older Cohort children, across four countries*



There are remarkable differences in work trajectories for both cohorts in terms of gender (Figure 6). In India in particular, there is a growing gap in the amount of time girls in the Older Cohort worked in relation to the Younger Cohort at ages 12 and 15. The amount of time girls work as they age is much more similar to that of boys by 2016. At age 15, girls from the Older Cohort worked almost double the amount that boys did. There are also important improvements in education.

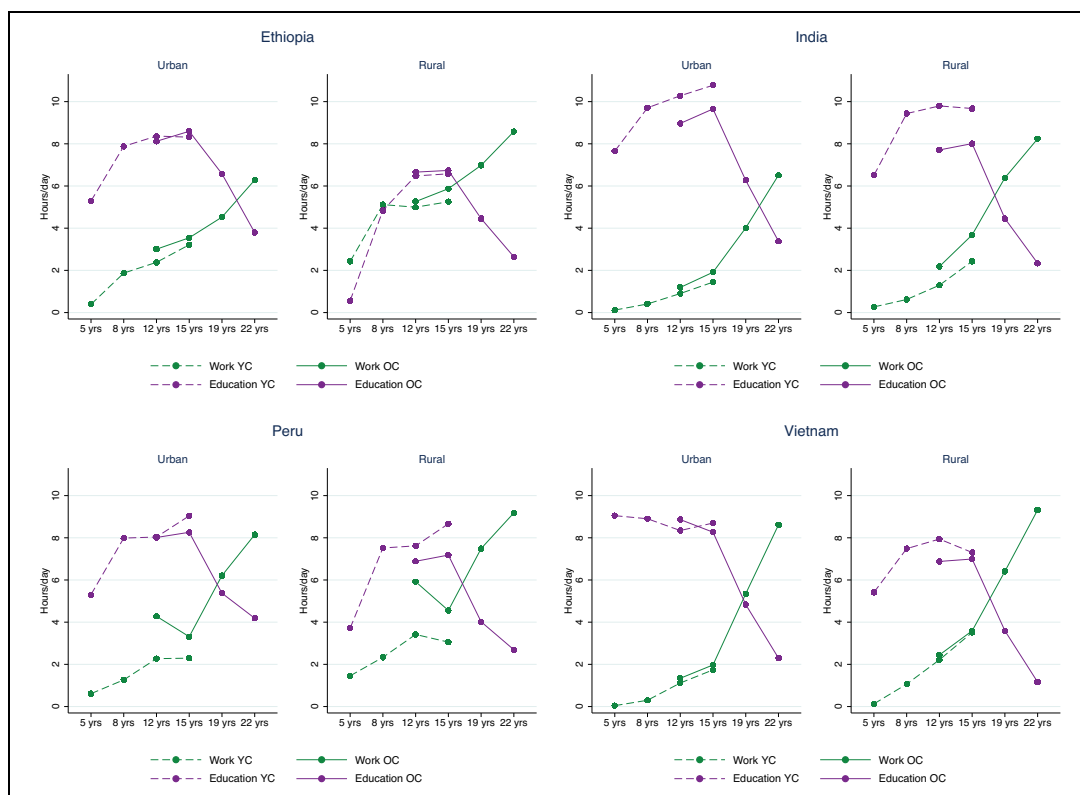
The gaps in education in Vietnam are also rather striking. As noted earlier, Vietnam is the country with the highest rate of school leaving between the ages of 12 and 15, despite having comparable enrolment rates in the early years, and higher cognitive achievement and school productivity than the other three countries (Singh 2015). This early departure from school, reflected by the fall in hours in education for the Younger Cohort, is particularly apparent for boys, and is reflective of national trends, as documented by Dang and Glewwe (2017). From an upward trend since the age of 5, the amount of time boys spend on education drops almost to the same amount of time boys from the Older Cohort spent seven years earlier. The fact that the amount of time boys from both cohorts spent in school coincides at age 15 suggests that boys in the Younger Cohort will likely follow the Older Cohort trajectory in the future, unless there is further intervention.

Figure 6. *Work and education for girls and boys from both cohorts*



Finally, we present differences by location in Figure 7. The fall in working times for children living in rural areas in Ethiopia is encouraging. Education in Peru has also increased quite remarkably. In Vietnam, children in rural areas have seen a sharp decrease in time spent on education between the ages of 12 and 15, reaching the levels of children born seven years before. Together with the previous results in terms of gender, this points to a double disadvantage for boys in rural areas of Vietnam.

Figure 7. *Work and education for children living in urban and rural areas from both cohorts*



4. Conclusions

Children’s work, especially in relation to their education, is a contentious topic that remains understudied. This working paper has addressed this gap by examining the evolution of time use and a range of household and individual factors associated with time spent working for 15 year olds living in four low- and middle-income countries.

We have documented that there are important differences across countries, both in the amount of time children work and study. While gender is not particularly important to explaining the amount of time children work, it does matter for particular activities within the work aggregate – girls do more housework and boys do more unpaid work in the household and paid work outside the household. Location, on the other hand, shows important differences for both time in work and education.

Life has changed for 15 year olds in relation to those born seven years before, especially for rural girls, who are working fewer hours in all countries except Vietnam. Ethiopia has seen fewer changes in time spent on education during this time period, though there is a clear downward shift in the trajectory of work hours between age 12 and 15. It remains to be seen what will happen to this trajectory as these young people reach ages 19 and 22 in due course.

While these results are novel and important, they present significant limitations. First, we do not provide causal explanations, but rather descriptive analysis. Second, our data are based

on questions around a typical day when school is in session, so cannot capture seasonality. Moreover, the amount of work may be underestimated as children often work on the weekend.

There is much scope for further research using the data, including examining what early factors explain how much children work at different ages, how the balance between work and education in childhood impacts the acquisition of skills (both cognitive and non-cognitive), and at what point (if any) work becomes detrimental for skills development.

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Evolving Time Use of Children Growing Up in Ethiopia, India, Peru and Vietnam, 2006-2016

Using detailed and comparable time-use data of children in four low- and middle-income countries, this working paper documents the evolution of their time spent on education, paid and unpaid work as they age from 5 to 15 years. Despite gendered differences in which tasks they undertake, total allocation of time to work (paid, unpaid and household chores) is not significantly different between boys and girls, except in India. Rural boys and girls work longer hours and spend less time in education at all ages in all countries, and differences in time use increase as the children age, driven mainly by those who leave school early.

We compare our study cohort with an Older Cohort surveyed in 2009 at age 15 to document trends over time. Time spent on work has decreased quite strikingly in Peru and India, to a lesser extent in Ethiopia, and not at all in Vietnam. This has reduced inequality of time use to the advantage of rural girls in particular. Boys in rural Vietnam and Ethiopia are more likely to stop attending school by age 15, though in India the risk is higher for girls.



An International Study of Childhood Poverty

About Young Lives

Young Lives is an international study of childhood poverty, involving 12,000 children in four countries over 15 years. It is led by a team in the Department of International Development at the University of Oxford in association with research and policy partners in the four study countries: Ethiopia, India, Peru and Vietnam.

Through researching different aspects of children's lives, we seek to improve policies and programmes for children.

Young Lives Partners

Young Lives is coordinated by a small team based at the University of Oxford, led by Professor Jo Boyden.

- *Ethiopian Development Research Institute, Ethiopia*
- *Pankhurst Development Research and Consulting plc, Ethiopia*
- *Centre for Economic and Social Studies, Hyderabad, India*
- *Save the Children India*
- *Sri Padmavathi Mahila Visvavidyalayam (Women's University), Andhra Pradesh, India*
- *Grupo de Análisis para el Desarrollo (GRADE), Peru*
- *Instituto de Investigación Nutricional, Peru*
- *Centre for Analysis and Forecasting, Vietnamese Academy of Social Sciences, Vietnam*
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