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Time Use of Youth during a Pandemic: Evidence from Mexico

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Abstract

We use a nationally representative sample of teenagers between 12 and 18 years old in Mexico to study changes in time use before and after the start of the Covid-19 pandemic. Our results demonstrate an overall reduction in 30 percent in the time that teenagers are spending on studies and an increase in the proportion of 15 to 18 year olds who are not engaged in school on the order of 20 percent and of 10 percent for those aged 12 to 14, relative to pre-pandemic. The reduction in time studying was accompanied by increases in work outside the home for the vulnerable group of youth aged 12 to 14.

Keywords: COVID-19, Mexico, education, time, youth

JEL Classification Codes: I20, J13, J22

I. Introduction

By mid-March 2020 and given the advance of COVID-19 in Latin America and the Caribbean, the vast majority of educational institutions in the region closed their doors for 160 million students (UNESCO, 2020). As of March 2021, only a few countries in the region (Argentina, Chile, Colombia, Nicaragua and Uruguay) had returned, to some degree, to in-person learning (Fernandez, 2021; Infobae, 2021; Medrano, 2021). In Mexico, 36.6 million students have remained home since the beginning of the pandemic, doing distance learning through the program "Aprende en Casa" (learn at home) which provides classes and broadcasts textbook contents online, through T.V. and YouTube channel of the Mexican Public Education Secretariat.

The experience accumulated by previous pandemics show that school closures have impacts both in the short run - increase dropout rates, child labor, violence against children, teen pregnancies, deepen socioeconomic disparities (Armitage and Nellums 2020; Rothe et al., 2015; Denney et al., 2015) – and in the long-run, in terms of loss in future income. For the case of COVID-19, a few studies have begun to report on the learning activities of school aged children during the pandemic (Le Nestour et al., 2020; Bosumtwi-Sam and Kabay, 2020; Debenedetti et al., 2020; Kihui, 2020). Specifically, in Latin America, Asanov et al. (2020) found that during the period of quarantine in Ecuador 74 percent of adolescents are engaging in some online or telelearning, and 86 percent have done some schoolwork on the last weekday.

A question is how these trends compare to pre pandemic. In this paper, we show how time use of adolescents has changed during the pandemic using nationally representative data from the National Occupation and Employment Survey (ENOE) for

2019 and 2020. The ENOE micro data is published every trimester and includes a short time use module thus enabling us to study time use patterns pre and post the beginning of the pandemic. Specifically, we study time use patterns of youth aged 12 to 18 in three main activities: studies, work outside the household and domestic work. We provide descriptive analysis of the changes before and after the pandemic as well as multi-variate analysis to test for differences in time use across subgroups.

Our results demonstrate a significant decrease in the proportion of teenagers who are spending any time on school, a likely risk factor for the probability of permanently dropping out even when classes return to in person. For those 15 to 18 years old (which corresponds to those in upper secondary school) who report at least one hour studied during the previous seek, we observe a significant decrease in time studying of about 20 hours during the new school year, with respect to pre pandemic. For those youth 12 to 14, that figure is 10 percent. Perhaps surprisingly, these reductions in time spent studying appear to be similar across different groups analyzed including gender, place of residence, and parental education levels.

School and work are often considered substitute activities. While the high unemployment rates during the pandemic would be expected to lead to a reduction in work for all groups, in fact we find increases in work outside the home for younger teens a particularly vulnerable group, with the largest increases by those in less urban communities. We show that the important reductions in time spent studying were not matched by increases in work outside the home or in the time spent doing household chore/caring for small children. However, we do find that some of the more vulnerable individuals in our study, in particular children aged 12 to 14 in less urban communities,

increase time spent working outside the home. There is also a small but significant increase in time spent on work inside the household. These trends are concerning because work at an early age has been shown to greatly increase the probability of dropout later (Beegle et al., 2009).

Our results are suggestive of the potentially high education cost of substantial time spent out of school. The large increase in teens age 15 to 18 who do not report spending anytime on education during the previous week is suggestive of a group at high risk for dropping out/not returning to school once schools re-open to in person classes if they have not already abandoned the idea of returning to school. The reductions in time spent even for those who continue to remain engaged with their studies to some degree is also likely to suggest loss in learning. Furthermore, our results are based on the beginning of the school year, where one would expect connections and time spent in studies to be high and potentially to decrease as the year of distance learning goes on. When students finally return to in person classes in Mexico, it will be critical to assess their learning losses.

Our results show across the board reductions in time spent studying, suggesting that few groups may be spared negative education effects of the pandemic. It is likely however that the quality of time in studies varies according to socio economic status. For instance, those able to access the educational videos and other materials produced by the SEP on internet versus those only able to watch classes on television are likely to suffer fewer learning losses of the pandemic. Studying the longer run effects of the pandemic on learning and dropout are critical questions for the future.

The paper is organized as follows. Section II discusses previous literature on the impacts of school closing and a summary of the Mexican education context during COVID-

19. Section III presents the data and sample used for the analysis, Section IV provides results and Section V concludes.

II. Context and previous literature

School disruptions

The study of other pandemics like the Ebola crisis and the H1N1 have shown that school closures in the short run increase dropout rates, child labor, violence against children, teen pregnancies – as well as deepen socioeconomic disparities (Armitage and Nellums, 2020; Rothe et al., 2015; Denney et al, 2015). For example, Selbervik (2020) highlights that after the Ebola crisis, 25 percent of Liberian children and 13 percent of those in Sierra Leone did not enter school after reopening.   In the longer run, Ichino and Winter-Ebmen (2004) study the effects of reduced access to schools during WWII comparing Austria and Germany with Sweden and Switzerland while Fink and Peet (2014) review data from 61 developing countries and find that one year of lost education is associated with a 6.5 percent loss in future income.

Other events such as strikes or natural disasters have also been used to study the effects of school disruptions. Jaume and Willen (2019) show that in Argentina, being exposed to the average incidence of strikes (88 days) during primary school reduces labor earnings of males and females between the ages of 30 and 40 by 3.2 percent and 1.9 percent, respectively. After Hurricane Katrina in New Orleans in 2005, Harris (2020) estimates that it took children a full two years to recover lost learning. La Mattina (2018) and Akresh and de Walque (2008) demonstrate reductions in schooling attainment following the 1992 Rwandan genocide.

Covid pandemic

Globally, Psacharopoulos, et al. (2020) suggest the world could lose as much as $10 trillion over the coming generation as a result of school closures today. School closure is not only associated with reduced learning, but also lack of access to subsidized meal programs, vaccination clinics, and overall safeguarding and supervision (Armitage and Nellums, 2020). Azevedo et al (2020) using data on 157 countries predict that COVID-19 could result in a loss of between 0.3 and 0.9 years of schooling adjusted for quality, bringing down the effective years of basic schooling from 7.9 years to between 7.0 and 7.6 years. They also estimate that close to 7 million students from primary through secondary education could drop out due to the income shock of the pandemic alone.

Some initial evidence on the measured education effects of the pandemic is beginning to emerge. Two initial studies provide evidence of important losses in learning from school closures during the pandemic (Engzell et al., 2020; Kuhfeld and Tarasawa, 2020). Le Nestour et al. (2020) show through a multi-country survey conducted between April 7 and 13 that the proportion of children not engaging in any learning activity at the beginning of the pandemic was 30 percent for Senegal; between 26-32 percent in Ghana (Bosumtwi-Sam and Kabay, 2020); and, 50 percent in Burkina Faso (Debenedetti et al., 2020). In Kenya, Kihui (2020) found that through a survey of 3,700 households in April that only 22 percent of children were engaged in online learning. Asanov et al. (2020) found through a random sample of 1,552 students surveyed by phone in Ecuador as the pandemic started between March 30 and April 25 2020 that 74 percent of students between 14 and 18 years old are engaging in some online learning and 86 percent have spent at least 1 hour doing schoolwork on the last weekday.

Distance learning in Mexico

The Mexican Public Education Secretariat announced on March 20th the official suspension of all in person academic activities in the country. While at least 10 state governments had decided to suspend classes starting March 17th, by March 20th officially 36.6 million students remained at home after schools closed to in person classes (Palma et al. 2020; EFE 2020).

The Public Education Secretariat designed three initiatives in order to continue the school cycle in the months that followed the suspension of classes. The first initiative "Aprende en Casa" consisted of providing classes and broadcasting contents online and open TV for each school grade. In the virtual platform, all information was stored so that students could review recordings and carry out exercises, and get personalized advice by phone, chat or email to solve tasks or doubts on specific topics of any subject. Through the virtual platforms, parents could also receive guidance to support their children in their academic matters. The second initiative "Estrategia de educación a distancia: transformación e innovación para México", offered learning tools through Google for Education and YouTube during the confinement period. Finally, the "Jóvenes en casa" initiative focused on offering cognitive and emotional support aimed at higher secondary education (Leal et al., 2020).

The Public Education Secretariat determined that the return to classes for the school cycle 2020-2021, which started on August 24th, would be carried out at a distance through "Aprende en Casa II" – where classrooms are provided by open cable and cable services, books are delivered freely and teachers can organize video sessions. The content of classes is available in 22 indigenous languages, and in targeted areas it is broadcast by radio. In

addition, 160 telephone lines of pedagogical support have been enabled (Diario Las Americas, 2020). The previous virtual platform features were kept for the new academic year.

Little concrete information on the effects of the pandemic on schooling in Mexico exists. The Centro de Estudios Educativos y Sociales (CEES for its name in Spanish) has estimated that the economic contraction product of pandemic will generate 4.3 million new "ninis" in Mexico – individuals between 15 and 29 years old that neither study nor work. Moreover, according to a report from PNUD, there are at least 800,000 students who currently attend the third year of secondary school that will interrupt their education after the pandemic in Mexico (a reduction of 15.55 percent). A recent study of "Aprende en Casa" in Aguascalientes for children in primary school mentions that between March-June 2020 64 percent of teachers reported the same number of students enrolled that at the beginning of the school year, but that 44 percent of parents think they do not have the appropriate conditions at home for distance learning (CIDE, 2021).

III. Data and sample

For our analysis of the effects of the pandemic on the time use of youth, we use the micro level data from the 2020 National Occupation and Employment Survey (ENOE) from Mexico's National Institute of Informational Statistics and Geography (INEGI). The ENOE is a nationally representative continuous household survey of 120,000 households per quarter and is the main source of Mexican labor market information. For this research, we use data for January-March 2020 and September 2020 to compare time use just before the pandemic started and at the beginning of the new school year following the beginning

of the pandemic. To the ENOE we merge municipal level data on the marginality (poverty) characteristics of the municipality[1], the supply of secondary schools, the availability of cellphones. Our sample consists of individuals between the ages of 12 and 18 years between January to March 2020 (before the pandemic)[2], and September 2020 (after the pandemic). The 2020-2021 school year in Mexico for public schools began on August 17th, thus our study focuses on effects of the pandemic on students at the beginning of the new school year following the beginning of the pandemic.

Table 1 provides some descriptive statistics. The average individual of our sample is aged 15, lives in a household with an average of five individuals, and where the household head has close to 9 years of education.

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[1] The margination index (defined by the Mexican Population Council (CONAPO)), is formed by taking the first principal component of socioeconomic aggregates from census data, and classifies all municipalities into one of five groups, ranging from "very high" to "very low" marginality (Conapo, 2011).

[2] The sample starts with interviews on January 15th onwards, accounting for the fact that classes in Mexico started January 8th after winter recess (and that the ENOE asks for activities the week before the interview)

Table 1: Summary Statistics

`VARIABLES	January to March of 2020		September of 2020	
	Mean	SD	Mean	SD
Age	15.01	2.00	14.95	2.01
Boys	0.51	0.50	0.53	0.50
Communities ≥ 100,000 inhabitants	0.43	0.50	0.45	0.50
Education of HH	8.70	4.4	8.93	4.42
Age of HH	46.7	11.60	46.7	11.03
Household Size	5.10	1.81	4.92	1.70
Proportion in municipality with cell	0.34	0.20	0.38	0.18
High or very high marginality municipality	0.39	0.49	0.39	0.49
N	38,247		13,048	

Descriptive analysis: time use of adolescents before and after the pandemic

We begin by studying the proportion of adolescents who engage in each of the three activities we study in this paper: weekly hours spent studying or taking courses of study; work outside the household (participating in paid work); and domestic work (caring for family members and household chores). Figure 1.a. shows the proportion of individuals studying at least one hour per week before and after the pandemic for boys, girls, youth living in communities with 100,000 inhabitants or more, and those in communities with less than 100,000 inhabitants. It is noteworthy that the proportion reporting having studied in the previous week is significantly higher for all groups pre pandemic with differences post pandemic increasing with age and particularly large at around 10 percentage points for those age 15 and above, loosely corresponding to ages for upper high school. The decrease is seen for boys, girls, youth in more urban communities and youth in less urban

communities[3]. It can also bee seen that for those younger individuals (those 12 to 14) the decrease in the probability of having studied in the previous week is higher in more urban areas than in less urban ones.

A reduction in the probability of spending time on studies might be associated with an increase in work. Figure 1.b shows changes in the proportion of individuals reporting working outside the household in the previous week before and after the pandemic began, again for girls, boys, children living in communities with 100,000 inhabitants or more, and those in communities with less than 100,000 inhabitants. As expected, labor market participation increases with age for all four groups. While overall changes in the probability of working outside of the household are small, there are suggestive differences by age. In particular, Figure 1.b. suggests a slightly higher probability of work for youth aged 12 to 13 post pandemic relative to pre-pandemic in less urban areas. The reverse is true for older youth, with the probability of working lower post pandemic beginning about the age of 15 for all groups, perhaps reflecting generally higher unemployment rates post pandemic than pre pandemic (Empleo y Ocupación (inegi.org.mx)). Finally, Figure 1.c. shows the proportion of teenagers engaging in work inside the household. This proportion does not show noticeable changes with the onset of the pandemic for girls, but does show small increases in participation in work inside the household for boys of all ages, although their overall participation level remains far below that of girls. For some age groups in less urban areas there is evidence of increases in participation in work inside the household post pandemic whereas no clear patterns emerge for those in more urban areas.

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[3] In accordance with the ENOE definitions to measure size of community, our sample is divided into a) communities with more than 100,000 residents and b) communities with less than 100,000 residents.

Figure 1. Proportion of teenagers who study, work outside the house and do domestic chores between 12 and 18 years old

Figure 1.a. Proportion of teenagers who study, by gender and place of residence
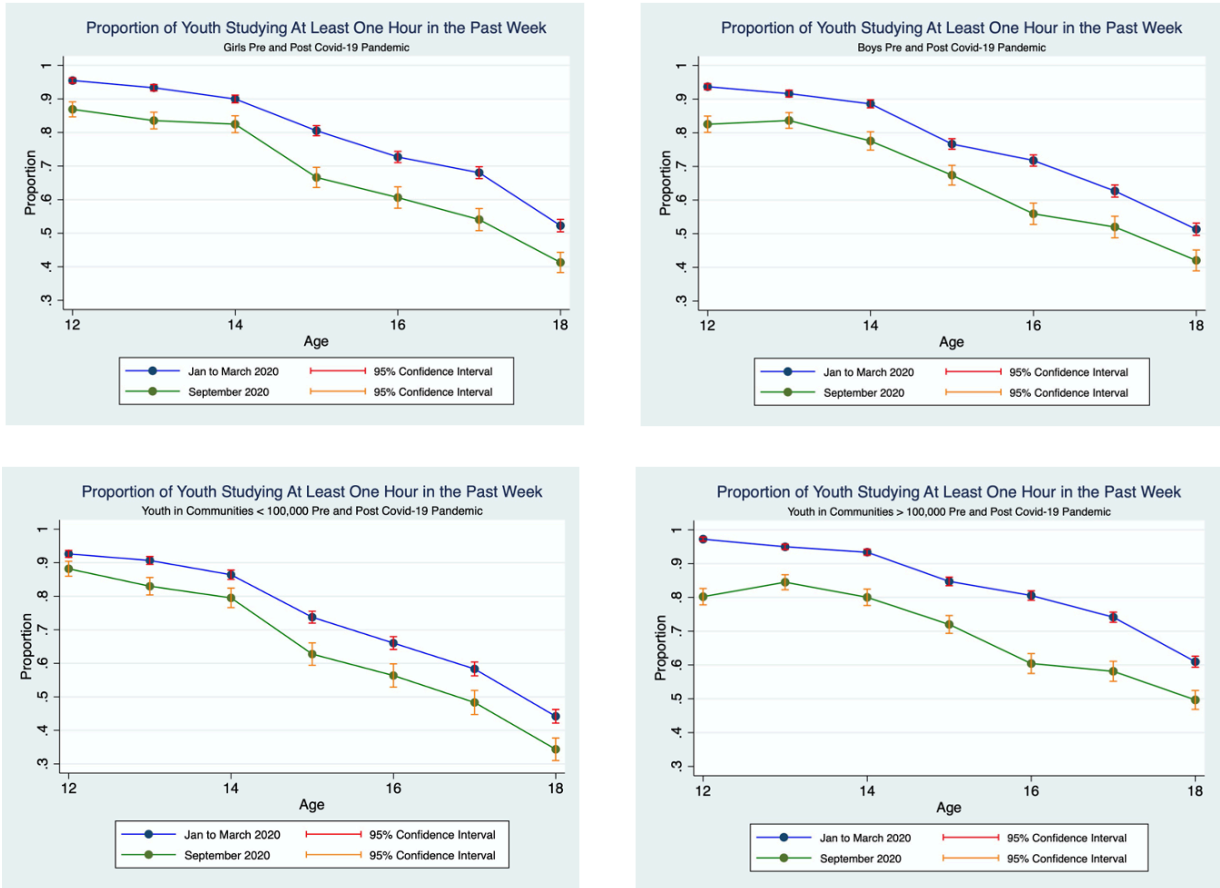
Figure 1.b. Proportion of teenagers who work outside the house, by gender and place of residence
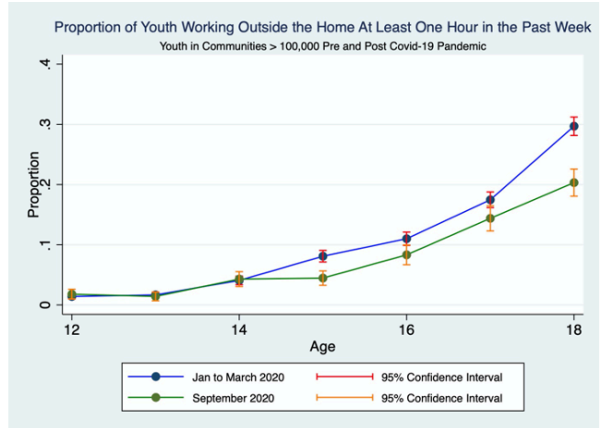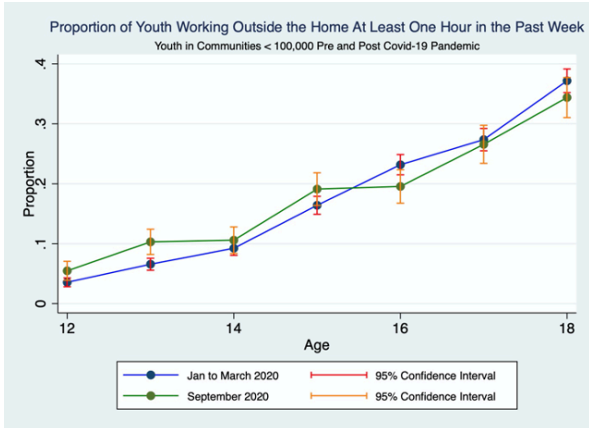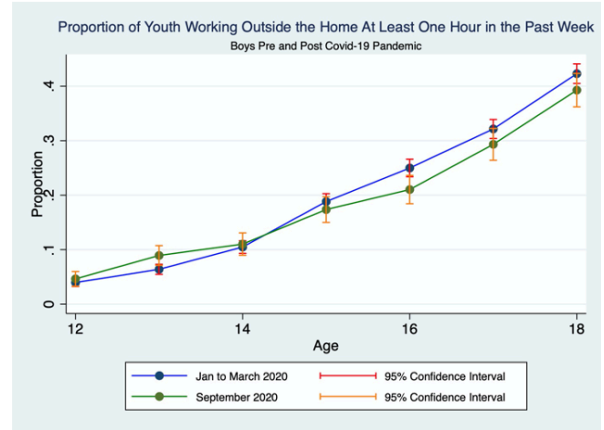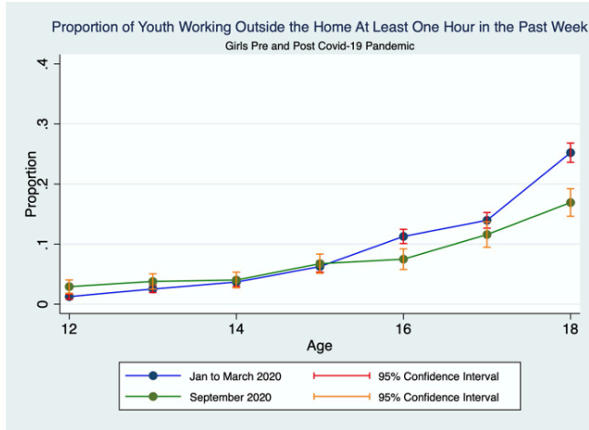
Figure 1.c. Proportion of teenagers who work inside the house, by gender and place of residence
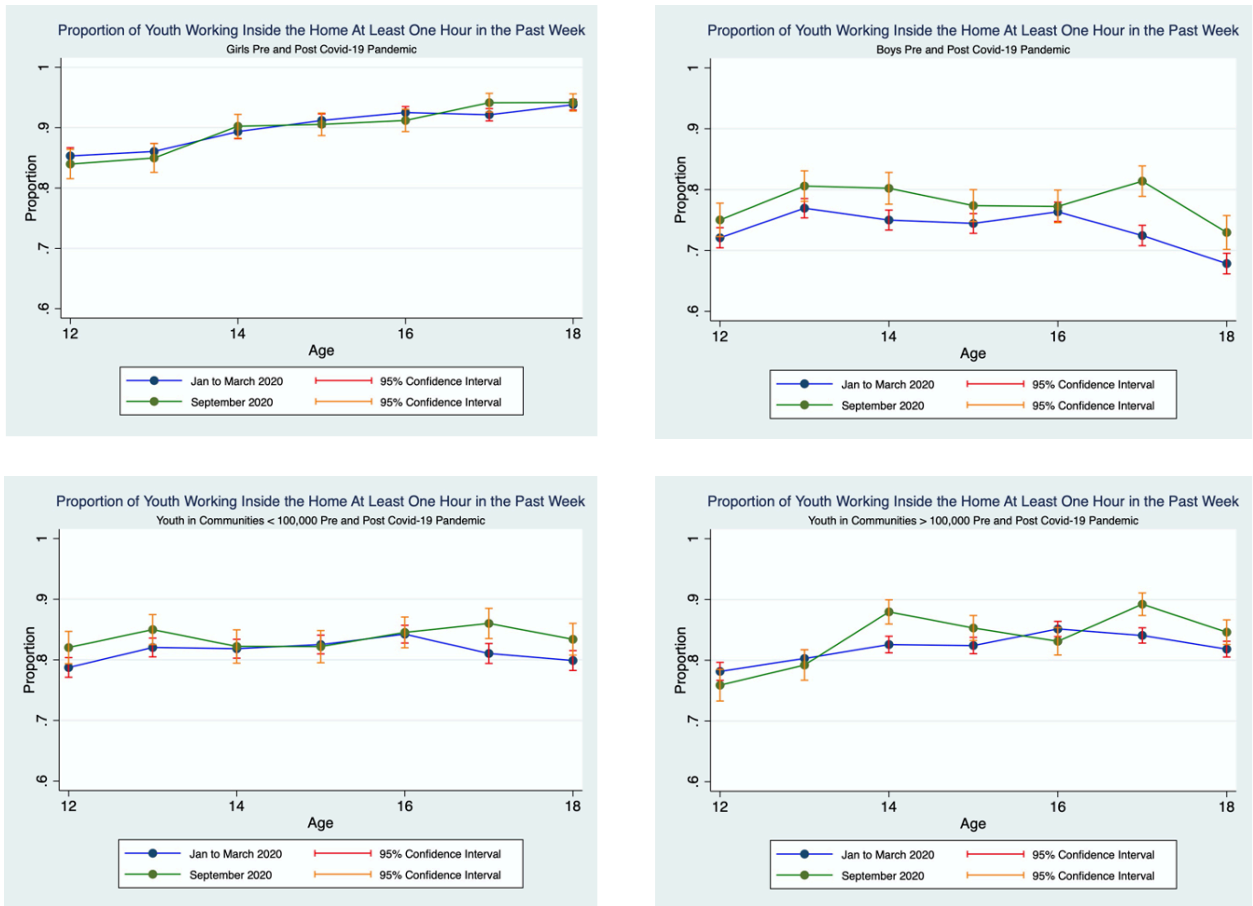
Source: own calculations based on ENOE

We now turn to hours spent in each of the three activities, conditional on participation in these activities. Figure 2 shows the density of hours in each activity before and after the pandemic for those who dedicate time to each activity. Figure 2.a. shows a striking shift in the density of hours studied to the left and an increase in the variance of hours studied. A similar shift occurs for younger (12 to 14) versus older (15 to 18) youth, for girls and boys, and for youth in more urban versus less urban communities. Whereas the average hours studied for youth who study pre pandemic was about 40 hours per week, this is reduced to a mean of about 27 hours per week, a reduction of more than 30 percent.

Whereas there are some differences between groups, for instance younger children study fewer hours than older children and children in less urban areas study slightly fewer hours than those in more urban areas, the overall reduction in studying during the pandemic dwarfs these differences.

Figures 2.b and 2.c show the density of hours spent during the previous week working outside and inside the household, respectively, conditional on engaging in each activity. Figures 2.b. illustrates that for those working outside the home, there are two peaks in the density roughly corresponding to part time and full-time work for all of the groups. However, there are more girls working part time and boys working full time for those who engage in work outside the home. Post pandemic, there are few general changes in the distribution of hours worked outside of the household with the exception of the group of younger youth age 12 to 14, which show a striking shift rightward in the distribution of hours suggesting an important increase in hours working for those who work. With respect to hours working inside the household, Figure 2.c. demonstrates that girls tend to have higher hours worked than boys pre pandemic but there are few changes for either group post pandemic. Hours worked inside the household for children in less urban areas are similar to those for children in more urban areas pre pandemic with few changes post pandemic.

Figure 2. Weekly hours spent studying, working outside the house and on domestic work

Figure 2.a. Weekly hours spent studying for teenagers who study, by gender, place of residence and age group
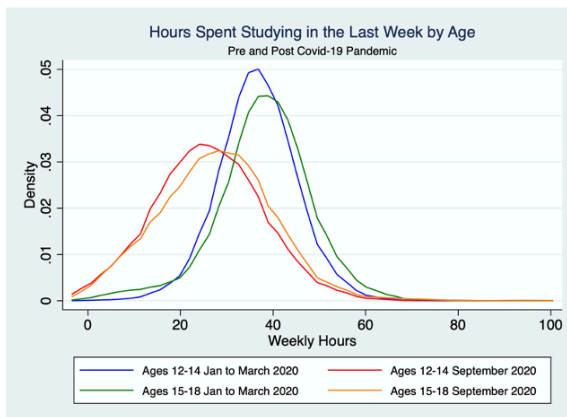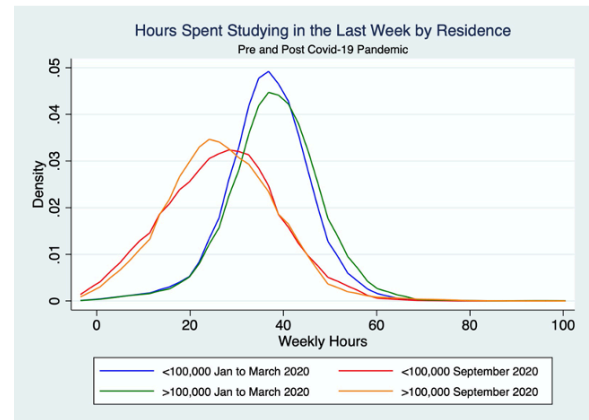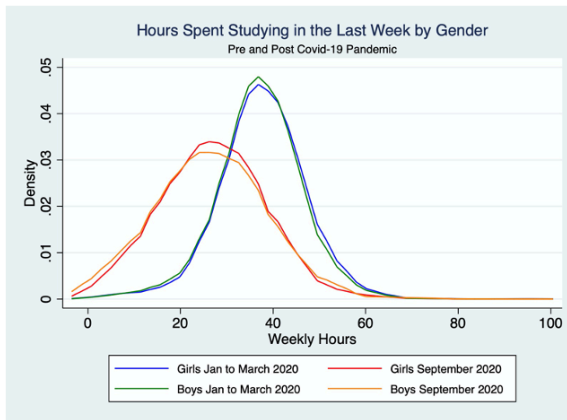
Figure 2.b. Weekly hours spent working outside the home for teenagers who work, by gender and place of residence
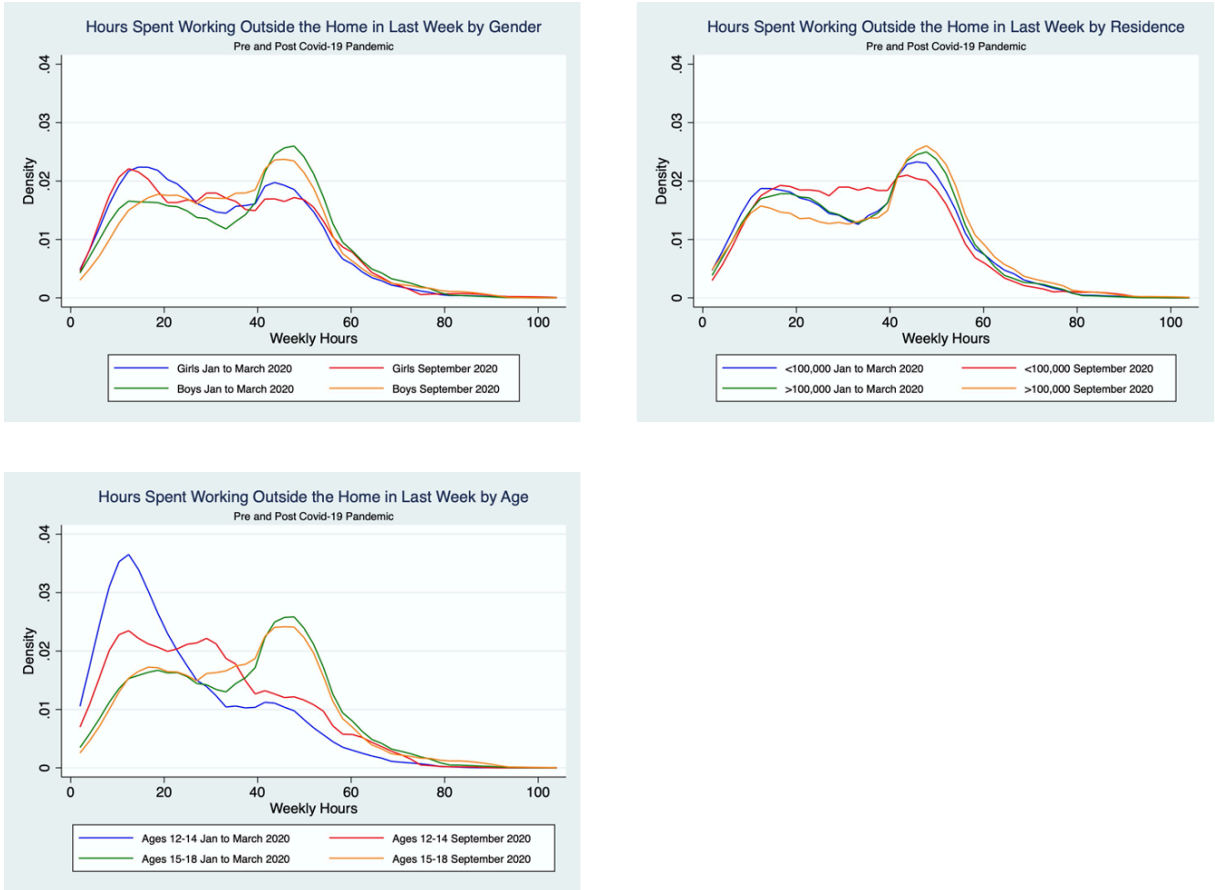
Figure 2.c. Weekly hours spent working inside the home for teenagers who perform domestic chores, by gender and place of residence
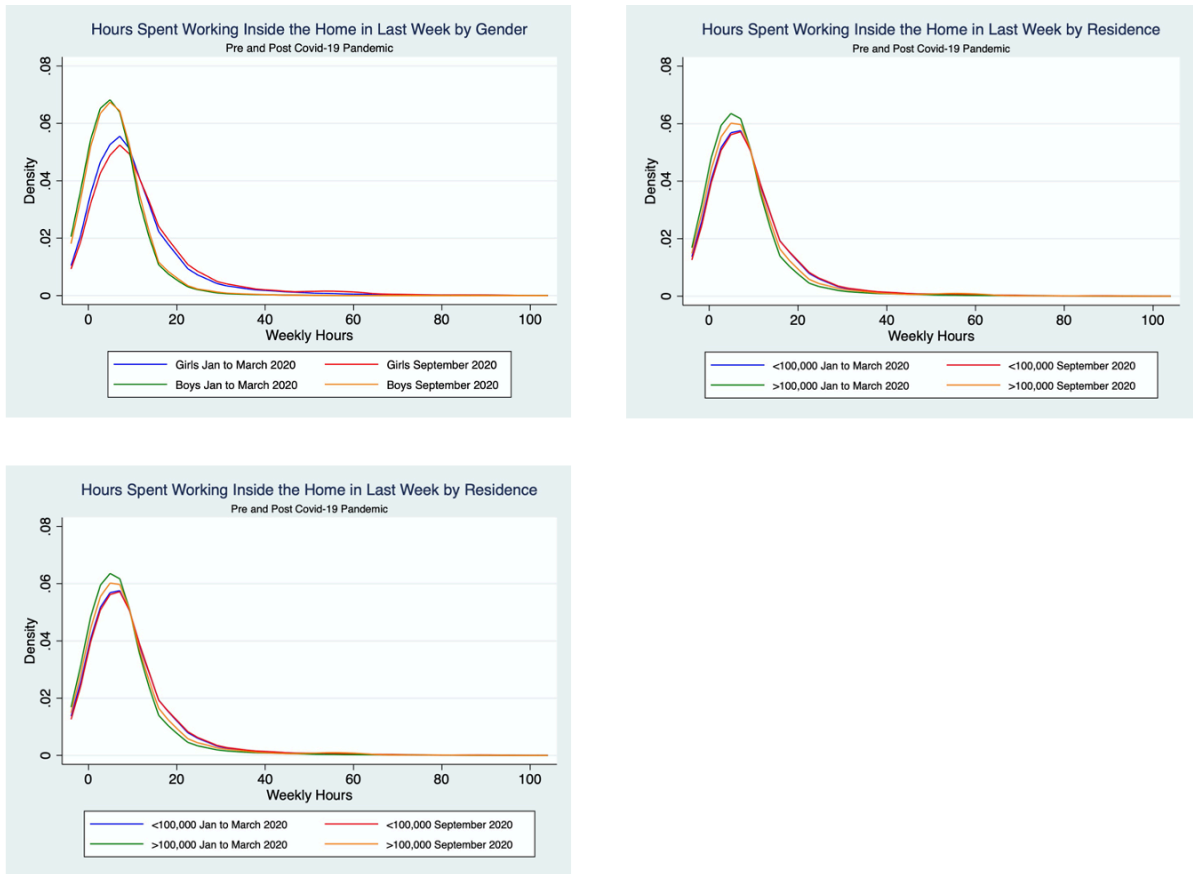
IV. Multivariate Results

Our descriptive analysis on time use above suggested some striking trends. There is a reduction in the proportion of youth age 12 to 18 studying pre versus post pandemic, particularly for older children. And for those children spending time in studies, there is a large reduction in time studied relative to pre pandemic at about 30 percent. Equally striking, these reductions are found for both genders and in more and less urban areas, suggesting a general reduction across the board in time spent studying. With respect to work both outside and inside the household, we found some suggestive evidence of

increases in the probability of work and hours worked outside the home for younger children and increases in the participation of work inside the household for all except youth in communities of 100,000 inhabitants or more.

We now turn to multi variate analysis to 1) summarize the effects of the pandemic on schooling and work and 2) to explore additional heterogeneity in these effects.

We estimate the following equation:

$$y_i = \beta_1 After_i + X_i + W_i + \varepsilon_i \tag{1}$$

where y_i includes the proportion of individuals who 1) study 2) work outside the home and 3) work inside the home the home in the week before the survey and the conditional weekly hours spent 1) studying 2) working outside the home and 3) working inside the home.; $After_{it}$ is a dummy variable that takes the value of 1 for observations in September 2020 and is our variable of interest measuring impacts of the pandemic, and 0 for Jan-March pre pandemic; X_i is a matrix of individual controls which include age, gender, place of residence, household size and household head variables including age, education (a dummy that represents having complete high school or more) and being the only parent present; W_i is a matrix of geographic level variables including proportion of individuals with cell phones and the Margination Index and ε_i is the error term which is clustered at the municipality level. In our specifications we also add interaction effects to account for heterogeneous responses to the pandemic.

Following our descriptive analysis, we carry out equation (1) for different subgroups including by age, gender, and area of residence. We report in the main text only the effects of the after pandemic dummy, e.g. the change which occurred in time use due to the pandemic, leaving the full regression results for the online appendix. Given the

differences that we observed by ages in our visual inspection, we divide our sample between youth aged 12 to 14, ages which correspond approximately to middle school and youth 15 to 18, which correspond to youth in ages to attend high school. In all tables, we provide the pre pandemic means of our dependent variables.

Table 3 shows multivariate linear probability model results for the proportion of individuals studying and working (inside and outside the household) at least one hour per week for the complete sample. Panel A in Table 3 shows a significant reduction of the pandemic in the probability of studying during the previous week for youth aged 15 to 18, and at a lesser extent, for youth age 12 to 14. This reduction is statistically significant for girls and boys and both youth in less urban and more urban communities, demonstrating a significant reduction nationwide across these different groups. The magnitude for those 15 to 18 years old is similar across groups ranging from 10 to 15 percentage points, which corresponds to a decrease in about 20 percent in the probability of studying from the pre pandemic mean.   The magnitude for the age group 12 to 14 ranges from 7 percentage points for those in less urban areas, to 13 percentage points for those in more urban ones (by gender the results are similar: 9 percentage points for girls and 11 percentage points for boys). Overall for this age group, the decrease in the probability of studying during the previous week is half of what was experienced by the youth aged 15 to 18.

With respect to the probability of working outside the home (Panel B of Table 3), we observe a significant increase in the probability of working outside the household for 12 to 14 year olds for the groups children in less urban areas (an increase of 2.8 percentage points) as well as boys and girls (2 and 1.1 percentage points, respectively). For the group of older youth age 15 to 18, there are no significant increases in the probability of working.

Rather, this probability is reduced for girls by 3 percentage points, for boys in 2 percentage points and for youth in more urban areas by almost 5 percentage points with no significant change for the group of youth in less urban areas. While the overall proportion of children aged 12 to 14 working outside the household remains relatively low less than 10 percent, the significant increase in less urban areas is cause for concern and perhaps reflects an increase in labor supply of this age group due to the generally high rates of unemployment in Mexico during the pandemic.

Finally, Panel C in Table 3 shows effects on the proportion of youth participating in domestic work in the household. Here there are fewer changes in the probability of participating in domestic work; there is a significant increase in the participation of boys in household work (who pre pandemic have much lower proportions participating in household work) and a significant increase in the proportion of youth 15 to 18 carrying out domestic work in less urban and more urban areas of around 2 percentage points.

We now turn to changes in weekly hours dedicated to studying, working outside the home and working inside the home during the pandemic (Table 4). Panel A shows that for those who dedicate time to studying, the average time dedicated falls significantly by between 10 to 11 hours per week. This decrease happens for all age groups and is similar in magnitude for boys and girls and similar in less urban and more urban areas. The pandemic has led to a decrease in time spent on studies even for those children who are studying in about 30 percent per week.

Panel B in Table 4 shows the impacts on hours spent working outside the home. Recall Table 3 demonstrated that the pandemic has led to an increase in the probability of working for the 12 to 14 year old group in less urban areas (and for both genders). Table 4

demonstrates there have been also significant increases in hours in less urban areas and for boys and girls as well. Girls aged 12 to 14 who work now work a large addition 9 hours per week, an increase of 40 percent. Boys aged 12 to 14 during the pandemic work an average of 4 extra hours per week. Finally, Panel B shows that this increase in time working for younger children is concentrated in less urban areas as might be expected. For 12 to 14 year olds in less urban areas, the average time spent working increased by a significant 7.4 hours per week in the pandemic. In more urban areas, the increase in time spent working outside the household with the pandemic is seen for older children: around 3 hours.

Finally, Panel C in Table 4 shows changes in the hours spent in domestic work during the pandemic and demonstrates a general increase in time spent in domestic work of between 0.45 and 2.04 hours per week, statistically significant for most groups. The largest increases occur for girls aged 15 to 18. Overall, the increases in time spent in domestic work correspond to increases in about 2 percent versus pre pandemic.

The ENOE datasets beside labor income contain limited information on socio economic status. To further explore how the effects of the pandemic may vary by socio economic status, we carried out interactions of post pandemic with the education level of the household head and by the margination index in the municipality of residence as well as the proportion of individuals with cellphone access, which in addition to socio economic status may proxy for potential access to internet to facilitate attending classes. These tables (found in the online Appendix) show limited evidence for significant differences in the effects of the pandemic by socio economic status. The effects on hours dedicated to schooling do not particularly vary by socio economic status of the household or by

proportion of those in the municipality with cell phones. For the case of work outside the home, we do find some evidence that the increases described earlier for youth age 12 to 14 are largely concentrated among households with lower socio-economic status. We find no effects of socio-economic status on the impact of the pandemic on time dedicated to work inside the household.

Table 3. Proportion of teenagers who study, work outside the household and work inside the household

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Girls		Boys		Communities ≥ 100,000 inhabitants		Communities < 100,000 inhabitants	
	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.
A. Study								
After	-0.087***	-0.13***	-0.11***	-0.12***	-0.13***	-0.15***	-0.071***	-0.10***
	(0.018)	(0.018)	(0.016)	(0.015)	(0.021)	(0.021)	(0.016)	(0.017)
Mean pre-pandemic	0.93	0.68	0.91	0.66	0.95	0.75	0.9	0.61
	(0.25)	(0.46)	(0.28)	(0.47)	(0.21)	(0.43)	(0.30)	(0.48)
B. Work outside the household								
After	0.011*	-0.030***	0.020*	-0.023*	0.00027	-0.046***	0.028**	-0.011
	(0.0061)	(0.010)	(0.012)	(0.013)	(0.0072)	(0.0077)	(0.011)	(0.013)
Mean pre-pandemic	0.02	0.14	0.07	0.29	0.02	0.17	0.06	0.26
	(0.15)	(0.35)	(0.25)	(0.46)	(0.15)	(0.37)	(0.25)	(0.44)
C. Work inside the household								
After	-0.0082	0.0018	0.033*	0.043***	0.0040	0.022*	0.021	0.023**
	(0.015)	(0.0083)	(0.020)	(0.014)	(0.020)	(0.011)	(0.018)	(0.011)
Mean pre-pandemic	0.87	0.92	0.75	0.73	0.80	0.83	0.81	0.82
	(0.34)	(0.26)	(0.43)	(0.47)	(0.40)	(0.37)	(0.39)	(0.38)
Observations	10457	14690	11074	15091	12033	17415	9498	12366

Standard errors in parentheses

* $p<0.10$ ** $p<0.05$ *** $p<0.01$

Table 4. Conditional hours spent studying, working outside the household and working inside the household

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Girls		Boys		Communities ≥ 100,000 inhabitants		Communities < 100,000 inhabitants	
	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.
A. Studying								
After	-10.6***	-10.4***	-10.8***	-10.2***	-11.4***	-11.1***	-10.2***	-9.59***
	(0.49)	(0.52)	(0.48)	(0.52)	(0.60)	(0.72)	(0.59)	(0.64)
Mean pre-pandemic	36.87	38.38	36.37	37.69	37.48	38.65	35.97	37.45
	(7.79)	(9.84)	(7.31)	(9.78)	(7.77)	(10.25)	(7.32)	(9.32)
Observations	10457	14690	11074	15091	12033	17415	9498	12366
B. Working outside the household								
After	8.83**	0.84	3.81**	-0.040	-2.01	3.39***	7.40***	-1.39
	(3.80)	(1.28)	(1.79)	(0.99)	(3.17)	(1.25)	(2.02)	(1.09)
Mean pre-pandemic	20.32	33.33	25.43	37.89	23.28	36.17	24.35	36.57
	(15.04)	(16.77)	(15.91)	(17.16)	(15.63)	(17.02)	(15.98)	(17.24)
Observations	239	1871	620	4039	281	2934	578	2976
C. Working inside the household								
After	0.45*	2.04***	0.48***	0.45**	0.63***	1.67***	0.37	1.16***
	(0.26)	(0.44)	(0.18)	(0.20)	(0.21)	(0.36)	(0.28)	(0.38)
Mean pre-pandemic	7.53	12.6	5.4	6.23	5.69	8.65	7.11	10.68
	(6.24)	(12.34)	(4.66)	(5.95)	(4.99)	(9.70)	(5.99)	(11.03)
Observations	9151	13637	8531	11537	9908	14845	7774	10329

Standard errors in parentheses
* p<0.10　　** p<0.05　　*** p<0.01

V. Discussion and Conclusion

We have studied the changes in time use of adolescents in Mexico that occurs during the Covid 19 pandemic. We have found striking evidence of a reduction in time dedicated to studies, including both a generalized reduction in the probability of studying (though in magnitude such decrease is higher for older children) and a reduction in the time spent on studies by all enrolled students. The increase of 20 percent among youth 15 to 18, and of 10 percent for those 12 to 14 who report not engaging in studies during the previous week, not even for one hour, suggest a complete disconnection from studies at least at the time of the survey. This is particularly worrying given our data derives from September, e.g. close to the beginning of the school year (school year starts in August in Mexico) when one would expect the probability of engaging in studies to be higher, and potentially decreasing as the year goes on with no in person classes. Our evidence thus suggests an important decrease in the number of students who are engaged with school, vis a vis pre pandemic. These students would seem to be at particularly high risk for abandoning school permanently even when in person classes resume.

Even for those students who do dedicate time to school show a reduction in time spent on studies of 30 percent relative to pre pandemic. Of course, a reduction in time spent studying is not necessarily consequential if students are still learning the same amount of material as pre pandemic. While we do not have direct measures of learning, this seems unlikely. Existing evidence from the pandemic in other contexts shows a significant reduction in learning, as measured by standardized tests, with learning from home and with few exceptions schools in Mexico have been closed during the entire

pandemic. When students finally return to in person classes in Mexico, an urgent matter will to be evaluate the extent of learning that occurred during the pandemic.

Our work also suggests some smaller, yet significant increases in work. While the proportion of youth aged 15 to 18 working outside the home decreases with the pandemic, the opposite occurs for younger youth age 12 to 14 in less urban areas who actually increase both the probability of working outside the home and the number of hours worked – something seen both for boys and girls. With the increases, now about 10 percent of youth aged 12 to 14 in less urban areas are working outside the home. It is concerning to observe an increase in this population which might later on lead to lower school attachment. There is also a small increase in the time dedicated to work inside the household with larger increases for older youth.

As of March 2021, all schools in Mexico had been closed for a full year, with few exceptions. Our results which include study of only the initial effects in the new school year point to sharply decreasing time spent studying. Further study is needed to document how enrollment, learning and studying evolves as disruptions in learning have continued in Mexico. The balance of the literature suggests that school closures tend to lead to early dropout, for instance the recent H1N1 pandemic led to increases in the probability of permanently dropping out of school in a number of developing countries (Selbervik, 2020).

Even for students who remain in school, a loss in learning seems probable with potentially long lasting effects on youth and adult well-being. Promising programs in other contexts might be pursued in Mexico to try to combat the reduction in learning. Summer school, a national tutoring program, as well as measures to increase learning feasible in distance learning models, such as distributing tablets and investing in internet networks in

rural areas should be considered. Nickow, Oreopoulos, and Quan (2020) for instance summarize the effects of tutoring in 96 different contexts, the vast majority of which showed positive effects. La Ferrarra and Carlana (2021) show tutoring can work to improve learning during the pandemic using online tutoring in Italy whereas Angrist et al (2020) show positive effects on learning through test messaging of math problems in Botswana. Effective measures to reduce and offset learning losses in Mexico are urgently needed.

Our results then show the short-run effects for Mexican teenagers on their time use with the pandemic. More research is needed to look at the effects of these reductions in time studying on learning and other educational indicators, as well as the effects of the pandemic on other variables related to schooling such as early fertility, marriage and adolescent risk behaviors. In terms of policy, it is important to think about strategies – like tutoring programs or summer school, to try to reverse the effect on learning and bring teenagers back to school.

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Table A.1 Proportion of teenagers who study, work outside the household and work inside the household

A. Study

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Girls		Boys		Communities ≥ 100,000 inhabitants		Communities < 100,000 inhabitants	
	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.
After	-0.087***	-0.13***	-0.11***	-0.12***	-0.13***	-0.15***	-0.071***	-0.10***
	(0.018)	(0.018)	(0.016)	(0.015)	(0.021)	(0.021)	(0.016)	(0.017)
Boys	0	0	0	0	-0.031*	-0.0052	-0.022	-0.029*
	(.)	(.)	(.)	(.)	(0.016)	(0.017)	(0.017)	(0.015)
Communities ≥ 100,000 inhabitants	0.013	0.060***	-0.0073	0.070***	0	0	0	0
	(0.016)	(0.021)	(0.021)	(0.016)	(.)	(.)	(.)	(.)
1 parent HH	-0.037**	-0.0066	-0.060**	-0.072***	-0.054**	-0.038**	-0.041**	-0.039**
	(0.018)	(0.018)	(0.026)	(0.018)	(0.027)	(0.018)	(0.018)	(0.018)
Age HH	0.00070	0.0018**	0.00099	0.0028***	0.00053	0.0028***	0.0011	0.0018**
	(0.00053)	(0.00079)	(0.00080)	(0.00084)	(0.00078)	(0.00086)	(0.00074)	(0.00074)
Kids ≥ 5	0.033***	-0.11***	0.0030	-0.030*	0.023	-0.070***	0.015	-0.076***
	(0.011)	(0.015)	(0.016)	(0.016)	(0.017)	(0.022)	(0.014)	(0.015)
HH size	-0.011***	-0.00023	-0.0088	-0.020***	-0.0073	-0.0021	-0.011**	-0.013**
	(0.0039)	(0.0051)	(0.0062)	(0.0052)	(0.0063)	(0.0056)	(0.0052)	(0.0057)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High Education HH	0.027	0.15***	0.059**	0.22***	0.028	0.16***	0.057**	0.21***
	(0.018)	(0.018)	(0.024)	(0.018)	(0.020)	(0.015)	(0.023)	(0.020)
Marg. Index	-0.015*	-0.0050	-0.012	-0.0099	-0.0052	-0.012	-0.018*	-0.0024
	(0.0086)	(0.0084)	(0.0098)	(0.0072)	(0.010)	(0.0084)	(0.010)	(0.0095)
Prop. Cell	0.043	-0.037	0.12**	-0.011	0.044	-0.054	0.10**	-0.0029
	(0.047)	(0.047)	(0.053)	(0.040)	(0.062)	(0.049)	(0.047)	(0.053)
Mean pre-pandemic	0.93	0.68	0.91	0.66	0.95	0.75	0.9	0.61
	(0.25)	(0.46)	(0.28)	(0.47)	(0.21)	(0.43)	(0.30)	(0.48)
Observations	10457	14690	11074	15091	12033	17415	9498	12366

B. Work outside the household

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Girls		Boys		Communities ≥ 100,000 inhabitants		Communities < 100,000 inhabitants	
	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.
After	0.011*	-0.030***	0.020*	-0.023*	0.00027	-0.046***	0.028**	-0.011
	(0.0061)	(0.010)	(0.012)	(0.013)	(0.0072)	(0.0077)	(0.011)	(0.013)
Boys	0	0	0	0	0.018***	0.10***	0.074***	0.20***
	(.)	(.)	(.)	(.)	(0.0040)	(0.011)	(0.013)	(0.016)
Communities ≥ 100,000 inhabitants	-0.022***	-0.049***	-0.062***	-0.11***	0	0	0	0
	(0.0084)	(0.012)	(0.012)	(0.014)	(.)	(.)	(.)	(.)

1 parent HH	0.021	0.052***	-0.018	0.018	-0.0046	0.023*	0.0080	0.040**
	(0.013)	(0.015)	(0.011)	(0.016)	(0.0066)	(0.012)	(0.015)	(0.020)
Age HH	-0.00011	-0.00095**	-0.00013	-0.0021***	-0.00025	-0.0027***	0.000054	-0.00056
	(0.00036)	(0.00044)	(0.00045)	(0.00073)	(0.00040)	(0.00058)	(0.00048)	(0.00064)
Kids ≥ 5	-0.0079	-0.010	0.0075	0.026*	-0.0078	0.040***	0.0033	-0.018
	(0.0080)	(0.011)	(0.0099)	(0.014)	(0.0086)	(0.013)	(0.0092)	(0.013)
HH size	0.0014	0.0070	0.0042	0.015**	0.0037	0.0030	0.0027	0.016***
	(0.0027)	(0.0043)	(0.0036)	(0.0061)	(0.0032)	(0.0035)	(0.0035)	(0.0056)
High Education HH	-0.029***	-0.034***	-0.065***	-0.19***	-0.021***	-0.092***	-0.079***	-0.13***
	(0.0051)	(0.010)	(0.013)	(0.014)	(0.0060)	(0.011)	(0.014)	(0.016)
Marg. Index	-0.0073	0.0093	0.0089	0.0063	0.0059**	0.0015	-0.0029	0.010
	(0.0049)	(0.0059)	(0.0067)	(0.0082)	(0.0024)	(0.0050)	(0.0077)	(0.0082)
Prop. Cell	0.0054	-0.052	-0.069**	-0.082*	-0.010	-0.0059	-0.051	-0.11***
	(0.018)	(0.032)	(0.031)	(0.042)	(0.013)	(0.032)	(0.031)	(0.038)
Mean pre-pandemic	0.02	0.14	0.07	0.29	0.02	0.17	0.06	0.26
	(0.15)	(0.35)	(0.25)	(0.46)	(0.15)	(0.37)	(0.25)	(0.44)
Observations	10457	14690	11074	15091	12033	17415	9498	12366

C. Work inside the household

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Girls		Boys		Communities ≥ 100,000 inhabitants		Communities < 100,000 inhabitants	
	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.
After	-0.0082	0.0018	0.033*	0.043***	0.0040	0.022*	0.021	0.023**
	(0.015)	(0.0083)	(0.020)	(0.014)	(0.020)	(0.011)	(0.018)	(0.011)
Boys	0	0	0	0	-0.058***	-0.12***	-0.13***	-0.22***
	(.)	(.)	(.)	(.)	(0.017)	(0.015)	(0.016)	(0.013)
Communities ≥ 100,000 inhabitants	-0.046***	-0.033***	0.0042	0.037**	0	0	0	0
	(0.017)	(0.012)	(0.028)	(0.018)	(.)	(.)	(.)	(.)
1 parent HH	0.039**	0.021**	0.027	0.045***	0.040	0.029*	0.024	0.040***
	(0.017)	(0.0090)	(0.022)	(0.017)	(0.028)	(0.015)	(0.018)	(0.013)
Age HH	-0.0020**	-0.00097***	-0.0011	0.00081	-0.0018**	0.00058	-0.0012	-0.00052
	(0.00079)	(0.00037)	(0.00087)	(0.00059)	(0.00086)	(0.00052)	(0.00080)	(0.00053)
Kids ≥ 5	0.014	0.023***	0.0024	0.023	0.0060	0.033***	0.012	0.017*
	(0.013)	(0.0067)	(0.017)	(0.015)	(0.019)	(0.012)	(0.013)	(0.010)
HH size	-0.0063	-0.0049*	-0.023***	-0.021***	-0.011*	-0.016***	-0.018***	-0.010**
	(0.0041)	(0.0027)	(0.0062)	(0.0051)	(0.0061)	(0.0041)	(0.0054)	(0.0043)
High Education HH	-0.019	-0.0097	0.029	0.086***	-0.020	0.027*	0.039	0.052***
	(0.014)	(0.011)	(0.029)	(0.016)	(0.018)	(0.014)	(0.030)	(0.012)

Marg. Index	0.0087	0.0063	0.0065	-0.0034	0.014	0.0071	0.00081	-0.0023
	(0.0091)	(0.0063)	(0.010)	(0.0096)	(0.015)	(0.012)	(0.0071)	(0.0058)
Prop. Cell	0.0091	0.021	-0.059	-0.0050	0.033	-0.017	-0.084**	0.022
	(0.046)	(0.033)	(0.055)	(0.051)	(0.076)	(0.058)	(0.037)	(0.035)
Mean pre-pandemic	0.87	0.92	0.75	0.73	0.80	0.83	0.81	0.82
	(0.34)	(0.26)	(0.43)	(0.47)	(0.40)	(0.37)	(0.39)	(0.38)
Observations	10457	14690	11074	15091	12033	17415	9498	12366

Standard errors in parentheses
* $p<0.10$ ** $p<0.05$ *** $p<0.01$

Table A.2 Conditional hours spent studying, working outside the household and working inside the household

A. Studying

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Girls		Boys		Communities ≥ 100,000 inhabitants		Communities < 100,000 inhabitants	
	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.
After	-10.6***	-10.4***	-10.8***	-10.2***	-11.4***	-11.1***	-10.2***	-9.59***
	(0.49)	(0.52)	(0.48)	(0.52)	(0.60)	(0.72)	(0.59)	(0.64)
Boys	0	0	0	0	-0.73	-0.77*	-0.43	-0.46
	(.)	(.)	(.)	(.)	(0.53)	(0.44)	(0.38)	(0.40)
Communities ≥ 100,000 inhabitants	0.76	0.37	0.32	-0.081	0	0	0	0
	(0.57)	(0.69)	(0.64)	(0.61)	(.)	(.)	(.)	(.)
1 parent HH	-0.096	-0.84	-0.95	0.35	-0.23	-0.89	-0.69	0.44
	(0.59)	(0.57)	(0.58)	(0.61)	(0.69)	(0.55)	(0.54)	(0.56)
Age HH	0.041**	0.046*	0.047**	0.022	0.015	0.052**	0.067***	0.020
	(0.019)	(0.024)	(0.023)	(0.019)	(0.016)	(0.021)	(0.024)	(0.020)
Kids ≥ 5	-0.026	-0.40	0.80	-0.37	1.04	-0.10	0.014	-0.68
	(0.44)	(0.47)	(0.61)	(0.53)	(0.76)	(0.42)	(0.42)	(0.51)
HH size	-0.22	-0.30	-0.53**	-0.065	-0.37*	-0.38**	-0.39	0.0062
	(0.14)	(0.18)	(0.26)	(0.18)	(0.19)	(0.17)	(0.24)	(0.18)
High Education HH	0.97**	0.69	1.82***	1.56***	2.26***	1.51***	0.52	0.65

	(0.45)	(0.43)	(0.67)	(0.58)	(0.53)	(0.51)	(0.55)	(0.60)
Marg. Index	-0.048	0.14	0.14	0.035	0.26	0.35	-0.10	-0.11
	(0.32)	(0.30)	(0.33)	(0.30)	(0.35)	(0.37)	(0.35)	(0.34)
Prop. Cell	-2.35	-2.15	-1.50	-5.57***	-2.78	-5.14**	-1.40	-2.76
	(1.48)	(1.70)	(1.64)	(1.67)	(1.82)	(2.40)	(1.70)	(1.78)
Mean pre-pandemic	36.87	38.38	36.37	37.69	37.48	38.65	35.97	37.45
	(7.79)	(9.84)	(7.31)	(9.78)	(7.77)	(10.25)	(7.32)	(9.32)
Observations	9581	9731	9959	9620	11003	11967	8537	7384

B. Working outside the household

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Girls		Boys		Communities ≥ 100,000 inhabitants		Communities < 100,000 inhabitants	
	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.
After	8.83**	0.84	3.81**	-0.040	-2.01	3.39***	7.40***	-1.39
	(3.80)	(1.28)	(1.79)	(0.99)	(3.17)	(1.25)	(2.02)	(1.09)
Boys	0	0	0	0	3.68	2.80***	0.094	4.55***
	(.)	(.)	(.)	(.)	(2.27)	(0.87)	(2.83)	(1.13)
Communities ≥ 100,000 inhabitants	-11.2**	3.54***	-5.97*	1.92*	0	0	0	0
	(4.72)	(1.19)	(3.27)	(1.11)	(.)	(.)	(.)	(.)
1 parent HH	14.4**	0.22	2.84	2.35**	7.82***	4.22***	6.89*	0.20

	(6.36)	(1.67)	(2.48)	(1.05)	(2.62)	(1.21)	(4.00)	(1.21)
Age HH	-0.17	-0.12*	0.0085	-0.11**	0.27	-0.16**	-0.098	-0.084*
	(0.13)	(0.063)	(0.099)	(0.048)	(0.18)	(0.063)	(0.094)	(0.044)
Kids ≥ 5	-3.06	1.49	0.037	1.13	0.47	1.37*	-1.38	0.97
	(4.07)	(1.37)	(1.81)	(0.73)	(3.44)	(0.69)	(2.10)	(0.93)
HH size	3.08*	0.33	0.50	-0.13	1.25	0.014	1.07	-0.028
	(1.68)	(0.49)	(0.73)	(0.31)	(1.22)	(0.35)	(0.83)	(0.31)
High Education HH	-3.07	-5.19***	-2.74	-4.67***	0.020	-3.29**	-5.86**	-6.33***
	(5.20)	(1.53)	(2.94)	(1.48)	(3.63)	(1.47)	(2.63)	(1.46)
Marg. Index	-0.14	-0.39	-0.42	0.37	-2.51*	-0.68	-0.075	0.44
	(1.73)	(0.71)	(0.96)	(0.46)	(1.49)	(0.67)	(0.91)	(0.43)
Prop. Cell	12.5	6.21*	-4.90	2.59	2.85	0.32	-1.87	5.25**
	(8.16)	(3.56)	(4.65)	(2.40)	(7.80)	(3.12)	(4.88)	(2.46)
Mean pre-pandemic	20.32	33.33	25.43	37.89	23.28	36.17	24.35	36.57
	(15.04)	(16.77)	(15.91)	(17.16)	(15.63)	(17.02)	(15.98)	(17.24)
Observations	239	1871	620	4039	281	2934	578	2976

C. Working inside the household

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Girls		Boys		Communities ≥ 100,000 inhabitants		Communities < 100,000 inhabitants	
	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.
After	0.45*	2.04***	0.48***	0.45**	0.63***	1.67***	0.37	1.16***
	(0.26)	(0.44)	(0.18)	(0.20)	(0.21)	(0.36)	(0.28)	(0.38)
Boys	0	0	0	0	-1.12***	-5.72***	-2.75***	-7.83***
	(.)	(.)	(.)	(.)	(0.22)	(0.56)	(0.26)	(0.37)
Communities ≥ 100,000 inhabitants	-1.66***	-1.17*	-0.32	-0.13	0	0	0	0
	(0.34)	(0.62)	(0.24)	(0.24)	(.)	(.)	(.)	(.)
1 parent HH	0.40	0.63	0.27	0.81***	0.42	1.12***	0.27	0.40
	(0.31)	(0.54)	(0.30)	(0.25)	(0.28)	(0.41)	(0.32)	(0.49)
Age HH	-0.028**	-0.088***	-0.0053	-0.027***	-0.033***	-0.047**	-0.0052	-0.074***
	(0.012)	(0.021)	(0.0088)	(0.0094)	(0.012)	(0.022)	(0.012)	(0.016)
Kids ≥ 5	0.74**	7.95***	0.80***	0.71**	0.87***	5.71***	0.72**	5.09***
	(0.30)	(0.73)	(0.23)	(0.29)	(0.26)	(0.89)	(0.29)	(0.64)
HH size	-0.11	-0.83***	-0.038	-0.056	0.0080	-0.60***	-0.12	-0.52***
	(0.093)	(0.19)	(0.093)	(0.086)	(0.091)	(0.19)	(0.11)	(0.16)
High Education HH	-1.30***	-3.98***	0.11	-0.71***	-0.51*	-2.37***	-0.58*	-2.55***
	(0.28)	(0.48)	(0.24)	(0.25)	(0.26)	(0.43)	(0.29)	(0.50)

Marg. Index	-0.076	-0.13	0.10	0.056	0.0070	0.14	0.0030	-0.17
	(0.18)	(0.31)	(0.12)	(0.12)	(0.17)	(0.25)	(0.17)	(0.21)
Prop. Cell	-0.48	-2.65	0.18	1.27**	-0.037	-1.60	-0.27	-0.33
	(0.88)	(1.67)	(0.55)	(0.57)	(0.86)	(1.31)	(0.84)	(1.26)
Mean pre-pandemic	7.53	12.6	5.4	6.23	5.69	8.65	7.11	10.68
	(6.24)	(12.34)	(4.66)	(5.95)	(4.99)	(9.70)	(5.99)	(11.03)
Observations	9151	13637	8531	11537	9908	14845	7774	10329

Standard errors in parentheses
* p<0.10   ** p<0.05   *** p<0.01

Table A.3 Proportion of teenagers who study, work outside the household and work inside the household

With interactions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Girls		Boys		Communities ≥ 100,000 inhabitants		Communities < 100,000 inhabitants	
	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.
A. Study								
After	-0.074*	-0.046	-0.14***	-0.11***	-0.16***	-0.099**	-0.083**	-0.070**
	(0.041)	(0.037)	(0.034)	(0.029)	(0.054)	(0.039)	(0.035)	(0.035)
After x High Educ HH	-0.056**	-0.099***	-0.037	-0.042	-0.013	-0.068***	-0.055	-0.056
	(0.028)	(0.030)	(0.036)	(0.029)	(0.030)	(0.025)	(0.038)	(0.039)
After x Marg. Index	0.0057	-0.17**	0.12	0.0030	0.079	-0.085	0.064	-0.062
	(0.085)	(0.080)	(0.085)	(0.071)	(0.11)	(0.080)	(0.085)	(0.088)
After x Prop. Cell	-0.0047	0.0069	-0.016	-0.00039	-0.0064	-0.016	-0.018	0.015
	(0.016)	(0.015)	(0.016)	(0.013)	(0.019)	(0.017)	(0.017)	(0.015)
B. Work outside the household								
After	0.013	-0.019	0.057**	-0.023	0.024	-0.073***	0.041*	0.014
	(0.013)	(0.025)	(0.027)	(0.029)	(0.018)	(0.018)	(0.024)	(0.031)
After x High Educ HH	-0.029***	0.037**	-0.033*	-0.0042	-0.0013	0.034*	-0.053***	0.014
	(0.010)	(0.016)	(0.019)	(0.020)	(0.011)	(0.018)	(0.019)	(0.031)

After x Marg. Index	0.0093	-0.061	-0.068	0.011	-0.058**	0.048	-0.0050	-0.083
	(0.030)	(0.050)	(0.047)	(0.064)	(0.025)	(0.036)	(0.052)	(0.068)
After x Prop. Cell	-0.015***	0.0100	0.022**	0.0081	0.010**	0.013*	-0.0015	0.0036
	(0.0057)	(0.010)	(0.011)	(0.012)	(0.0050)	(0.0073)	(0.011)	(0.012)
C. Work inside the household								
After	-0.014	0.0046	0.024	0.043	-0.049	0.017	0.053**	0.030
	(0.029)	(0.020)	(0.033)	(0.031)	(0.036)	(0.026)	(0.026)	(0.024)
After x High Educ HH	-0.000015	0.018	0.035	0.0026	0.0025	0.0021	0.057	0.026
	(0.025)	(0.022)	(0.040)	(0.025)	(0.024)	(0.020)	(0.046)	(0.021)
After x Marg. Index	0.023	-0.015	-0.0038	-0.013	0.16**	0.014	-0.13**	-0.039
	(0.071)	(0.047)	(0.082)	(0.067)	(0.080)	(0.061)	(0.068)	(0.058)
After x Prop. Cell	0.010	0.014	0.0035	-0.018	0.012	0.00081	-0.0058	-0.0071
	(0.014)	(0.0092)	(0.016)	(0.013)	(0.017)	(0.011)	(0.014)	(0.010)

Standard errors in parentheses
* p<0.10   ** p<0.05   *** p<0.01

Table A.4 Conditional hours spent studying, working outside the household and working inside the household

With interactions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Girls		Boys		Communities ≥ 100,000 inhabitants		Communities < 100,000 inhabitants	
	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.	12-14 y.o.	15-18 y.o.
A. Studying								
After	-10.3***	-9.15***	-10.6***	-8.78***	-12.3***	-9.69***	-9.20***	-8.33***
	(1.01)	(1.21)	(1.13)	(1.17)	(1.36)	(1.79)	(1.24)	(1.26)
After x High Educ HH	-0.22	-1.45	1.12	0.71	2.11**	-0.16	-0.47	0.48
	(0.90)	(0.96)	(1.13)	(1.02)	(0.95)	(0.70)	(1.06)	(1.18)
After x Marg. Index	-0.89	-1.97	-1.67	-4.85*	0.41	-3.08	-2.85	-4.35
	(2.65)	(2.56)	(2.42)	(2.73)	(2.88)	(3.74)	(2.94)	(2.88)
After x Prop. Cell	-0.10	0.24	0.50	0.18	0.67	0.86	-0.32	-0.54
	(0.56)	(0.49)	(0.52)	(0.49)	(0.62)	(0.72)	(0.68)	(0.58)
B. Working outside the household								
After	6.89	-3.34	2.76	-1.56	-11.3*	1.51	5.83	-3.38*
	(6.18)	(3.09)	(3.36)	(1.77)	(6.17)	(2.13)	(3.57)	(2.03)
After x High Educ HH	5.71	1.71	6.05	1.62	12.3**	2.95	4.34	-1.22
	(12.0)	(2.74)	(4.95)	(2.09)	(5.86)	(2.44)	(5.78)	(2.75)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
After x Marg. Index	3.05	11.7	1.10	4.37	18.9	1.68	3.38	7.09
	(16.1)	(7.80)	(10.3)	(4.65)	(15.2)	(6.19)	(10.5)	(4.91)
After x Prop. Cell	-3.02	-0.61	-1.88	0.51	-1.52	-2.16**	-2.54	1.36
	(3.30)	(1.25)	(1.69)	(0.76)	(3.36)	(0.84)	(1.76)	(0.84)
C. Working inside the household								
After	0.30	3.34***	-0.21	0.38	0.50	2.38***	-0.20	1.56*
	(0.57)	(1.00)	(0.40)	(0.40)	(0.53)	(0.83)	(0.56)	(0.80)
After x High Educ HH	-0.061	-0.88	0.88**	-0.45	0.039	-0.54	0.84*	-1.33
	(0.44)	(0.69)	(0.38)	(0.47)	(0.42)	(0.57)	(0.47)	(0.86)
After x Marg. Index	0.27	-3.47	1.16	0.35	0.22	-2.03	1.07	-0.56
	(1.31)	(2.36)	(0.94)	(0.89)	(1.06)	(1.77)	(1.48)	(2.06)
After x Prop. Cell	-0.42	-0.78*	-0.078	-0.36**	-0.16	-0.80**	-0.26	-0.31
	(0.26)	(0.45)	(0.18)	(0.17)	(0.21)	(0.35)	(0.28)	(0.35)

Standard errors in parentheses

* p<0.10   ** p<0.05   *** p<0.01