



How does child work affect education and health?

A literature review of causal evidence on the impacts of child work on education and health.

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The International Cocoa Initiative is a non-profit partnership organisation dedicated to improving the lives of children and adults in cocoa growing communities. We are experts on child labour and forced labour in cocoa, advising governments and corporations to inform their practices and influence decisions-making, and working with NGOs in the field. We are committed to achieving sustainable cocoa production that protects the rights of children and adults worldwide.

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Introduction

In Sub-Saharan Africa, around one in ten children were estimated to be involved in child labour in 2020, most of them in agriculture (ILO, 2021). Agriculture is considered as one of the most dangerous sectors in terms of work-related fatalities, non-fatal accidents and occupational diseases, since there are numerous hazards: work with dangerous tools and machinery or chemicals and pesticides (Forastieri, 1997; O'Donnell et al., 2005). Most children working in agriculture work within the family unit (ILO, 2021), making it very challenging for regulators to supervise or to conduct labour inspections in this sector (Fassa et al., 2000). The Covid-19 pandemic, which is driving many vulnerable households into poverty, is likely to further increase children's vulnerability to work in the near future (Ahad et al., 2020; Idris, 2020). Child labour remains a persistent global issue, and a thorough understanding of its consequences is necessary to improve public and private policies aimed at improving children's well-being and enabling them to reach their full potential.

Academic literature, international norms, national legislation and anti-child labour campaigns are based on the assumption that child work may have harmful effects on children's development. These adverse effects are the basis for the distinction between child work and child labour:

Child labour is defined by the International Labour Organisation (ILO) as “any type of work that deprives children of their childhood, their potential, and their dignity, and that is harmful to physical and mental development” [emphasis added]

Conversely, some forms of child work are considered as beneficial to children, contributing to their education and development. This fundamental distinction encompasses the highly heterogeneous reality and potential impacts of child work which, depending on many factors, thus range from beneficial to deeply detrimental.

This literature review explores the **harmful consequences of work by children** and describes the complex, nuanced, and multidimensional relationship between child work, schooling, and health outcomes. For the sake of simplicity, and because many of the studies included in this literature review do not distinguish between the types of work (e.g., child work, child labour, hazardous child labour), we will be using the terms “child work” and “the severity of child work” to refer to this large scope of situations and potential outcomes.

We focus on the key child outcomes affected by the performance of an economic activity during childhood and adolescence. These outcomes include school attendance, dropout, and academic performance, the child's physical and mental development, and the consequences of child work on their adult lives.

This study provides an up-to-date review of the literature on the consequences of child work on children's development, education, and health.

Aims of the study

The review focuses on studies which aim *to quantify to what extent child work causes harm to the child*, drawing on rigorous quantitative studies, that allow estimation of quantitative causal effects.

ICI commissioned this review of evidence to help understand the link between child work and harm, with the aim of informing operational responses to prevent and address child labour. To effectively prevent long-term or irreversible damage to children, the right support needs to be provided at the right time. By better understanding which children are at the greatest risk of harm, the types of harm they face, and the mechanisms by which harm occurs we hope to be able to better protect them.

Structure and methodology

To date, a few existing reviews have summarised some evidence on the impacts of child work on education and physical and mental health, such as Edmonds (2007) Dorman (2008) and Ibrahim et al (2009). However, these reviews mostly rely on descriptive statistics (cross-sectional designs) and case studies. In contrast, this review focuses on rigorous quantitative studies, using research methods allowing the estimation of causal effects. The studies included date back to 1995 and come from several databases,¹ from a manual search and from relevant grey literature, including reports from ILO, World Bank and Unicef.² The selected studies primarily relate to child work in developing countries, focusing mainly on agriculture. A few studies of child work in other sectors and contexts were also included when they provided causal evidence of mechanisms or consequences that could be applicable to agricultural contexts. We excluded some types of work categorized by the ILO as the unconditional worst forms of child labour, such as children in slavery and sex workers.

This review focuses on rigorous quantitative studies, using research methods that allow the estimation of causal effects.

Identifying the causal relationships between child work and these outcomes is complex. This can be challenging when interpreting the results. Income, for example, is both a cause and a consequence of child work, while directly impacting education and health. Isolating the pure effect of child work from that of income is therefore difficult. Other confounding factors, such as parental preferences, may alter the causal identification. Furthermore, most studies consider education or health as isolated outcomes, whereas multiple interactions exist. Finally, timing issues may arise when trying to estimate the impact of child work, since some negative outcomes may manifest themselves years after exposure to work, and blur the causal pathway. A detailed discussion on these methodological issues is provided in Appendix 3, and should be taken into account when interpreting the findings that follow.

These empirical studies provided quantitative estimates of the impacts of child work on children's education and economic/occupational trajectory, physical and mental health, both in the shorter and longer term.

1 The following databases were used: EconLit, NBER, RePEc, ScienceDirect, Springer, Wiley, PudMed

2 Table 1 in the Appendix lists the keywords (related to child work and its possible outcomes) used to conduct this survey.

Causal evidence of harm caused by child work

How does child work affect education?

Short term educational outcomes

School attendance

Many empirical papers have tested the relationship between work and school participation. The most compelling literature supports the **existence of a negative relationship between child work and school attendance** (Assaad et al., 2010; Boozer and Suri, 2001; Ray and Lancaster, 2005; Sugiyanto and Digidowiseiso, 2019). The following causal papers³ mostly focused on Asian countries and, using mainly data from before 2000, establish this negative relationship for children of different ages (7-17 years).

The more hours a child works, the more likely there will be a negative impact on school attendance.

In Ghana, Boozer and Suri (2001) find that an increase of one hour per week in child work (including all types of work, except domestic work) leads to a 0.38-hour decrease in contemporaneous schooling for children aged 7-18 years. They find that the impact differs according to gender: working overall has a negative impact on boys' school attendance in both the short and long term, while there seems to be only a negative effect in the long term for girls. Similarly, when looking at the impact of the intensity of work (number of hours worked per week), they find that each additional hour worked for boys has a large negative impact on their schooling, while the impact is relatively small for girls.

Assaad et al. (2010) confirm this negative relationship between hours worked and school attendance in Egypt both for boys (market work) and girls (mainly involved in household chores) aged 10-14 years. They find that for the same level of school attendance, girls usually work more hours than boys and that the negative effect is larger for them⁴. Nevertheless, the negative effects of child work on school attendance remain small and insignificant below 14 hours per week for boys, and 10 hours per week for girls, suggesting that child work would have a negligible effect on school attendance below a certain threshold.

³ The samples used in all the papers cited in this section include all possible types of situations: children only attending school, children only working, children combining work and schooling.

⁴ However, it is not clear whether the effect is greater for girls because they work more hours per week or whether their type of work (household chores) is more detrimental than the market work performed by boys.

This result is also found by Ray and Lancaster (2005) in Sri Lanka, where children aged 12-14 were shown to work up to 12-15 hours (all types of child work included) per week without impacting their school attendance. Nevertheless, this idea of a threshold is not confirmed in the other countries included in their study (Belize, Cambodia, Namibia, Panama, Philippines, Portugal) since they find that child work, even in a limited amount, negatively impacts school attendance.

Sugiyanto and Digdowiseiso (2019) find a negative relationship between child work and school enrolment in Indonesia for teenagers (12-15 years old), but no significant relationship between the number of hours worked in market work in the week prior to the survey and school enrolment. This might be explained by the short recall period (they only capture the number of hours worked in the week prior to the survey, which is not representative of the yearly working time of the child).

In the United States⁵, Lee and Staff (2007) find that working intensively in a paid job (more than 20 hours per week) increases the probability that high school students will drop out of school. Cardoso and Verner (2006) find no negative impact of any type of adolescent labour (12-18 years old) on the probability of leaving school early in the context of urban Brazil. The result is mainly explained by the author as the fact that the income earned at work helps pay for transportation costs to continue to attend school.

Academic performance

The literature mainly suggests a **negative relationship between child work and school performance** when looking at written test scores in different fields, such as reading and mathematics (Delprato and Akyeampong, 2019; Gunnarsson et al., 2006; Lee et al., 2021). For instance, analysing 15 countries in Latin America, Delprato and Akyeampong (2019) find that working children aged 13-14 years and involved in any type of work in or outside the household, have lower scores than non-working children in math and reading by 9 and 13 points, respectively. Looking at 11 Latin American countries and focusing on paid work outside the home undertaken by children aged 8-15, Gunnarsson et al. (2006) finds that the results on language and mathematics exams of children who are working, even occasionally, are on average 7% and 7.5% lower than those of children who are not performing any work.

In some cases, the negative effect of child work on school performance seems to occur from the very first hours, i.e., even for a small volume of work per week. Mavrokonstantis (2011) finds that a one standard deviation increase in the number of hours worked per day in paid market work, unpaid work for the household, and household chores by children aged 12 in urban Vietnam⁶ reduces maths scores by 12.45 points out of 100, three years later. Likewise, Woldehanna et al. (2017) find that an extra hour of any type of work per day for children aged 12-15 in Ethiopia results in a 6.2% reduction in their school performance.

Some studies show a negative effect of child work on school performance even for a small volume of work per week, while others suggest the negative effect of child work on school performance might only be harmful above a certain threshold.

⁵ The following studies, although limited in terms of findings, were included as no study has yet been conducted on the impact of child work on school dropout in rural developing countries.

⁶ Results for the rural sector are not interpretable because of poor instrumentation of rural child labour.

However, some studies find a negative effect of child work on school performance only above a certain threshold. Bezerra et al. (2009) find in urban Brazil that adolescent labour (13-14 years old) has no impact on school performance if the child works *less* than 14 hours a week, but a negative impact above this threshold. This takes into account both activities performed at home and outside the home.

The magnitude of the impact of child work on school achievement possibly depend on the type of work the child does. There seems to be a consensus in the literature focusing on Latin American countries that children who work outside the household experience a greater negative impact on their school performance than children who work for the household business or in household chores (Bezerra et al., 2009; Delprato and Akyeampong, 2019; Kassouf et al., 2020). The authors of these studies suggest that children who work outside the household, or who work both inside and outside the household, work longer hours per day. However, no descriptive statistics comparing hourly workloads per day between different types of work are available, making it impossible to validate this hypothesis.

The **age at which a child is exposed** to work may also influence the extent to which it negatively impacts school performance. Looking at children aged 8-14 and engaged in work outside the household in both urban and rural⁷ settings in West and Central Africa, Lee et al. (2021) find that the academic performance of younger children (8-12 years) suffers more from work than older children (13-14 years).

Few studies that have found a positive impact of children's work on their academic performance, with the exception of Dumas (2012). Focusing on teenagers (14-18 years old) working outside the household and for the household business in Senegal, the author finds a positive impact of child work on oral maths test scores. She argues that these skills may be improved when the child is required to perform calculations while working, such as in commerce.

Summary

The literature on the effect of child work on education outcomes tends to posit a detrimental effect of work participation on school attendance and learning. This effect seems to depend on the type of work (whether the child works in or outside the home), its intensity, but also when it occurs (age of the child).

The causal literature indicates that:

- Child work negatively affects school attendance (Boozer and Suri, 2001; Assaad et al., 2010; Ray and Lancaster, 2005; Sugiyanto and Digdowiseiso, 2019).
The question of whether there is a jabhold (in terms of worked hours) beyond which children's work becomes negative for their school attendance remains a subject of discussion, with some studies finding a threshold of 14 hours per week (Assaad et al., 2010; Ray and Lancaster, 2005) and others finding negative effects of children's work on their school attendance from the very first hours of work (Boozer and Suri, 2001).
- Child work negatively impacts their educational performance (Delprato and Akyeampong, 2019; Gunnarsson et al., 2006; Lee and Staff, 2007).
Whether this negative impact occurs from the first hours of work or beyond a certain threshold, as for school attendance, is still debated (Bezerra et al., 2009; Delprato and Akyeampong, 2019).
- The younger the child, the more negative the impact of work on school performance.
- The academic performance of a child who works only inside the home appears to suffer less than that of a child who works only outside the home, or who does both.

⁷ Rural child work is mainly composed of agricultural work.

Long-term educational outcomes

The literature tends to show that the negative effects of child work on school performance do not stop at short-term effects.

Years of schooling/school dropout

Child work is **negatively associated with the number of years of schooling** (Beegle et al., 2008; 2009; Sim et al., 2017; Zabaleta, 2011).

Beegle et al. (2009) find that children aged 8-13 years who worked⁸ in 1992-1993 in Vietnam have a significantly lower level of educational attainment five years later compared to those who did not work. A mean level of child work (7 hours per week) leads to a 1.6 year (21 percent) decrease in educational attainment five years later.

Zabaleta (2011) finds that an increase of one hour of work⁹ per day for children aged 6-14 years is associated with a reduction of almost 0.4 years of schooling completed three years later in Nicaragua, and a 2% reduction in the probability of completing elementary school.

In Tanzania, focusing on work outside the home and household chores, Beegle et al. (2008) find that for boys aged 7-15 years, a one standard deviation increase in child work hours (5.7 hours) is associated with a decrease of more than a half year of schooling three years later, and a 14.1 percentage point reduction in the chance of completing primary school. They find no impact for girls, who are mainly engaged in household tasks. The authors argue that girls may perform tasks that are less damaging to education than boys, who are involved in both household chores and work outside the home, mainly agricultural work.

Child work reduces the number of years of schooling a child completes

The impact of child work on the number of **years of schooling depends on the intensity of the work** performed by the child. Zabaleta (2011) finds that above three hours of work per day, each additional hour of work is associated with a loss of four months of educational attainment three years later in Nicaragua. They also found that below two hours per day, child work conversely had a positive effect on years of schooling. Thus, going from one to two hours of work per day increases the number of years of schooling by about ten months.

In Tanzania, Beegle et al. (2008) also find that above 15 hours per week, child work reduces the time spent in school by 2.6 years and the probability of completing elementary school by 36% ten years later. Testing different thresholds, Beegle et al. (2008) conclude that the negative impact of child work on schooling appears even at a moderate level of work and that the negative effects increase with the intensity of child work.

The impact of child work on years of schooling completed may vary depending on whether the child works for the household business, for a business not related to the household, or household chores. In the medium term, Zabaleta (2011) finds that an additional hour of work per day in market production (including work for the household farm) is associated with poorer academic progress three years later in Nicaragua, compared to an additional hour of work in household chores. In the longer term, Sim et al. (2017) confirm this relationship in Indonesia by finding that children of 10-14 years working outside the family business have about 1.5 fewer years of completed education than those working for the family business 7 years later.

⁸ Here is considered income-generating work, including work on the family business or farm.

⁹ The study only takes into account market work and household chores.

Studies show that children's work negatively impacts both school attendance and academic achievement, with long-term effects.

Academic performance

In Ethiopia, Woldehanna et al. (2017) find a negative effect of child work on school performance three years later, and Kassouf et al. (2020) find a similar result for Brazil at a time horizon of 4 years, focusing on market work outside the household and household chores. Sim et al. (2017) suggest that these negative effects might be long-lasting, as they find that Indonesian children aged 10-14 and engaged in market work in 2000, compared to children who were not working, experienced 0.37 standard deviations lower growth in mathematics skills seven years later. Looking at the same time horizon, Mavrokonstantis (2011) comes to the same conclusion for Vietnam.

This long-term effect can be explained by the apparently **cumulative effect** of child work on school performance, that is, the academic delay accumulated in the first year of work is added to the delay accumulated the next year, and so on. Indeed, Emerson et al. (2017) find that for Brazilian boys aged 10-17 years in the urban sector, each year of work (work outside the home and household chores) leads to a 3.1 point decrease in test scores, indicating a **linear and cumulative effect of child work on school performance**.¹⁰ They do not find any significant effect on girls due to the small sample size, but the relationship remains the same. Hence, it seems that the delay accumulated during the working school years may **remain even in the absence of subsequent exposure to work**, at least in the medium term (one year after having stopped working). Indeed, they find that boys who stopped working a year before continue to have lower results than those who never worked. The relationship seems identical for girls (same direction of the coefficients) but not significant (again, probably because of the small sample size).

Adult earnings

Few causal studies examine the impact of child work on earnings as an adult.

Lambon-Quayefio and Owoo (2018) find a negative relationship between any type of child work and adult earnings, with a reduction 14.3% in earnings of people who start working before the age of 12 years in Ghana. They also have increased odds of being in relatively low-skilled jobs in the future compared to being in technical and more professional jobs.¹¹

Posso (2017) finds a similar result in Ecuador, with former child workers earning 17% less than people who began work as adults.¹² This negative effect of child work on adult earnings is greater when individuals are 30 years and older than when they are younger. That is, the difference in earnings between those who worked as children and those who did not **becomes more pronounced after they reach the age of 30**. The author suggests that there might be cognitive differences between former child workers and others and that these become more apparent when they reach full maturity, around the age of 30. Nevertheless, this remains a hypothetical assumption and the regressions performed by the author do not allow for a causal link or even a correlation between child work, cognitive skills, and adult earnings.

¹⁰ The authors find that the average effect of child work on math scores for boys was a 3% decrease in standard deviation, and a 5% decrease in Portuguese.

¹¹ This is a correlation result, not a causal one.

¹² The author provides no information about the type of child work included in the study, perhaps because the data used did not contain this information.

Emerson and Souza (2011) show that the age of exposure also matters when looking at the impact of child work on adult earnings. They suggest that the negative effect of child work on adult earnings stops when the child reaches between 12 and 14 years old. To properly understand this finding, it is necessary to describe the Brazilian context in which the study took place. During the analysis period (1988-1996), the average number of years of schooling was around 6 years. Brazilian children officially started school at age 7, which means that on average, children left school at age 13. This suggests that starting to work before this age may negatively impact children's future earnings, preventing them from reaching the average level of human capital. More precisely, they find that an additional year of school is associated with 13.4% higher adult earnings, but that starting work before age 13-14 has a negative impact on adult earnings, even if the child attends school frequently. On the opposite, starting to work after this age could have beneficial effects through the acquisition of new skills, which allowed them to increase their level of human capital and differentiate themselves from others who did not have the opportunity to develop these kinds of skills at such a young age.

Likelihood of farming

This specific outcome has been studied to investigate if child work has a valuable effect in the long-term in a sector which requires fewer academic skills. The main idea is that a child working in agriculture acquires skills specific to this sector. These skills may not be easily transferable to other activities and thus may encourage him to remain in agriculture as an adult. This choice could be further strengthened if the child has not reached a high level of education, and much of his or her human capital is composed of knowledge and skills acquired as a child worker in agriculture. Child work in agriculture could therefore influence the likelihood that children will remain in agriculture as adults, thus influencing and narrowing their future occupational perspectives. There are no causal papers for this outcome, but Beegle et al. (2008) provide some interesting correlations. They found that Tanzanian boys who worked in childhood or adolescence (mostly in agriculture) are more likely to be farming 10-13 years later as adults. Indeed, a one standard deviation increase in working hours (5.7 hours) per week results in an 18 percentage point increase in the likelihood of farming in adulthood.

Summary

The causal literature suggests far-reaching and negative impacts of child work on schooling and overall economic life as an adult:

- Child work at a given time point reduces the number of subsequent years of schooling completed by the child / precipitates school dropout
This negative effect increases with the intensity of work (hours worked). However, some evidence suggests that below a certain threshold work may have a positive effect on overall years of schooling.
- Child work at a given time point reduces the child's school performance years after
This adverse effect of child work is cumulative, indicating that the academic delay accumulated in the first year of child work is added to the next year, and so on.
- Evidence shows that long-term consequences of work on school achievement remain, even if the child stops working.
- By hindering education completion and learning performance, child work can impact adult labour market outcomes, especially for a job requiring academic skills.
- Working as a child narrows the individual's occupational perspectives, notably increasing the likelihood of farming.
- A working child is likely to have lower adult earnings than a child who did not work at a young age.

How does child work affect physical and mental health?

Short term effects on physical health

Anthropometric indicators

Anthropometric indicators are one of the categories of objective proxy measures associated with children's development. Besides, they are responsive to environmental and economic changes. Several indicators have been studied such as weight-for-age (O'Donnell et al., 2005), height-for-age (Kana et al., 2010; O'Donnell et al., 2005), body-mass index (BMI) (Beegle et al., 2009; Kana et al., 2010), and height growth (O'Donnell et al., 2005; Beegle et al., 2009). All these studies find either little or no effect of child work on these indicators at the individual level. This could be explained by the fact that these indicators are primarily determined during early childhood, before a child is susceptible to work.

Self-reported health status

Several papers employing robust empirical strategies show that working as a child has a negative impact on health, when examining both contemporaneous and subjective self-reported health.

Many studies show that working as a child has a negative impact on health.

Wolff et al. (2008) found a negative correlation between performing any economic activity between 10 to 15 years old and the probability to suffer from at least one health complaint during the last month (10 items) in Indonesia. Their conclusion is robust to various measures of health.

Nicolella and Kassouf (2018) show that a 0.1 increase in the proportion of children aged 5-15 years old working in Brazil results in a decrease of 0.4 percentage points in the proportion of children with "excellent" health status. They also find that the greater the **number of hours** of work performed by children, the worse their health status.

Posso (2017) shows that children aged 10 to 17 years old that work at least one hour a day over the week or 7 hours a week are potentially 1.7% more likely to have health concerns than children that do not work at all.

Other robust papers looked at the nature of work, by trying to separate the effect of **hazardous and non-hazardous work**. Nicolella and Kassouf (2018) classify each child activity as being hazardous or non-hazardous (according to the Brazilian Occupation Code). They observe that hazardous activities are around four times more likely to have a negative effect on children's health, compared to other types of non-hazardous work. Posso (2017) also disentangle their results according to the severity of work. On average, if a child does heavy lifting at work for 7 hours per week, he or she is 0.8% more likely to have health concerns than a child who does not work at all.

While these papers demonstrate a negative relationship between child work and health, others find an absence of effect. For instance, O'Donnell et al. (2005) show no effect of child (6-15 years old) agricultural work on contemporaneous health in rural Vietnam. More specifically, unpaid agricultural work for the household appears to have no short-term impact on health, while the paid work may even improve nutrition and contemporaneous health. Using the same dataset than O'Donnell et al. (2005), Beegle et al. (2009) confirm that there is no effect of working for children aged 8 to 13 years old on current health status. More precisely, the probability of illness is not significantly associated with child work, and the number of days ill among those who have been ill does not significantly increase with child work.

Contextual factors

Several contextual factors may influence the likelihood of a child suffering negative health outcomes. For example, resilient children may be able to recover their initial health status after minor or reversible injuries, especially when healthcare services are accessible and efficient. Income generated from work may also be reinvested in health care and nutrition.

According to Posso (2019) **location** matters: children living in urban are generally less likely to report health problems than children in rural regions. Wolff et al. (2008) also found some differences between urban and rural areas. They find a significant negative effect on health only for the rural sub-sample.

One study found that hazardous activities are around four times more likely to have a negative effect on children's health, compared to other types of non-hazardous work

Wolff et al. (2008) analyse if there are **gender** differences in the effects of working on health. When focussing only on economic activities and excluding household chores, they show that boys may be more vulnerable than girls to damaging impacts of working as they are more likely to carry a heavier workload in this type of work. The sector of activity also differs as girls are more likely to work for the family business rather than on farms, while boys work predominantly on farms. According to the authors, boys are therefore more likely to be engaged in more strenuous activities than girls. They observe that among boys the probability of reporting a given symptom is always higher when the child works. However no significant differences can be found between working and non-working girls.

Summary

Causal evidence shows that:

- The contemporaneous health status of the child and child work are not clearly linked, with some studies finding a negative effect, while other find no effect, or even a positive effect in certain circumstances.

- Anthropometric indicators do not seem to be affected by work, certainly because work occurs after the period where these indicators can be influenced. These studies observing anthropometric indicators therefore underline the importance of timing when it comes to the effect of child work in a given outcome.
- However, some evidence suggests that child work comes with work-related injuries or illness, and that their likelihood increases with the number of hours worked.
- Moreover, hazardous activities are linked with an increased likelihood of poor health status, compared to non-hazardous.
- Context matters: there is a notable difference between rural and urban areas, with the former being linked to higher likelihood of poor health outcomes in working children.
- Gender differences in the effect of work on the child's contemporaneous health status depend on the nature of work assigned to each gender.

Long-term physical health

Self-reported health

O'Donnell et al. (2005) showed that children aged 6 to 15 years who worked for household farm and business or outside of the household, were significantly more likely to report illness five years later, compared to non-working children. Conversely, Beegle et al. (2009), using the same data but focusing on a different sub-sample (children aged 8 to 13 years old), observed non-significant patterns. These contradictory findings may be explained by their different sample selection. It is also important to note that the two studies use different empirical strategies and definitions of child work, making them difficult to compare.

Lee and Orazem (2010) focus on self-reported adult health (measured by the incidence of chronic diseases and by functional limitations in performing activities) and investigate whether the age of entry in the labour market matters. They found that having worked during childhood increases the incidence of adult chronic diseases and functional limitations. However, this is an indirect effect: reduced years of schooling and the resulting occupational choices mainly explained these adverse effects.

Rosati and Straub (2007) demonstrate that having worked between the age of 6 and 14 years increases by about 40% the probability of reporting poor health as an adult. Similar results are found in Nishijima et al. (2015): entering into the labour market in Brazil before 18 years old adversely affects adults' health, in terms of propensity to chronic diseases, physical difficulty, and overall health status. They find that starting a first job during childhood affects health outcomes in adulthood through both direct health factors (past injuries) and indirect educational ones (loss of school years).

Summary

Causal evidence shows that:

- Child work is very likely to have negative effects on adult health. These effects may be direct and/or indirect / cascade effects (work has a negative effect on health by negatively impacting another area, which in turn directly affects health).

Mental health

The literature on the effect of child work on mental health is still in its infancy and is characterised by the use of different measurements and samples, making the different articles difficult to compare. However, four recent papers employ robust empirical strategies and give an insight into the effect of child work on mental health.

Short term effects

Trinh (2020) focuses on the contemporaneous effects of labour on child mental health measured by the Strengths and Difficulties Questionnaire (SDQ) in Vietnam and India. He finds that children under 15 years having worked in the past two weeks present a lower mental health than non-working children.

Child work negatively affects children's mental health.

Feeny et al. (2021) explore the effect of child work in rural India on children aged 12 to 18, using psychosocial measures of happiness, hope, emotional well-being, fear and stress. Their empirical strategy consists of comparing working and non-working siblings, which enable to control for parental characteristics known to be associated with mental health, such as genes and parental education. They shows that child work is negatively associated with psychosocial well-being: working children display lower levels of happiness, emotional well-being, self-efficacy, and hopefulness than their non-working siblings.

Long-term effects

Other papers analyse the effect of child work on mental health in the longer run.

In a recent unpublished paper, Baryshnikova and D.G. (2020) investigate how child work among Indonesian children between 5 and 14 years old affected their mental health seven years after (depression symptoms). They find a substantial negative impact on a child's long-term mental health status. They complement their study by providing some heterogeneity analysis according to the type of work and show that working for a wage, outside the family enterprise, is even more detrimental for mental health, as it increases the average score by 6 points, suggesting the presence of significant depressive symptoms. However, their study shows that working in family enterprises does not alter mental health.

Aransiola et al. (2018) show an age-dependent effect of having worked as a child in Brazil: children who started working between 10 and 14 years are (slightly) more likely to report a diagnosis of depression in adulthood than children who started working between 15 and 17 years. The risk of diagnosed depression was continuously lower for individuals aged 18-19, and for 20-24. Their results are, however to be considered as subjective evidence as they do not correct for the selection into work bias.

Summary

- Evidence regarding the long-term effects of child work on mental health is too limited and lacks robustness. However, it is suggestive of a negative and age-dependent effect and suggests that working conditions matter, for example if the child works outside or in the family setting.

Conclusions

The impact of child work on education and health is complex and multi-dimensional. While several methodological challenges make it difficult to measure and compare its effects, the empirical literature reviewed in this study shows that child work is generally linked with adverse outcomes in terms of health and education, although a few studies find no effect:

- The vast majority papers examined find that child work impairs school attendance and learning, translating to fewer years of education completed and lower earnings as an adult.
- Regarding health, most papers find that working as a child have a negative impact on reported health, in both the short and longer term.
- However, we see no effect on the objective measures of health such as height or body mass index.
- While the literature on the impact of child work on mental health is still in its infancy, the few studies available suggest that working is harmful for children's psychosocial health.

The empirical literature examined shows that child work is generally linked with adverse outcomes in terms of health and education.

This review of literature highlights several important trends:

- **The greater the intensity of child work, the greater the likelihood of harm:** intensity relates to the number of hours worked, as well as to the physical or cognitive difficulty of the task
- **There is a threshold in the intensity of child work beyond which harm occurs** but below which working may be neutral or have beneficial consequences
- **Harm caused by child work is cumulative – the earlier a child starts working, the more likely the impacts are severe.** Missed schooling, impaired learning and negative impacts on health at an early age are likely to persist and are harder to compensate for later on. Equally, children who start working earlier are likely to accumulate more hours of work and be more exposed to any hazards.

These findings point to the importance of actions to reduce the intensity of children's work, to limit exposure to hazards and more harmful types of work and to intervene as early as possible in order to prevent an accumulation of negative effects that could prevent children from reaching their development potential. In order to do this, both preventative action and efforts to identify children at-risk *before* they have already suffered significant exposure to child work are important elements. Based on the evidence of many different types of harm from child work, these findings also highlight the need to consider a range of remedial actions to counteract these, and support the development of academic, behavioural, socio-emotional and economic competencies.

Summary of effects

The following tables synthesize the nature of the causal effect (negative, no effect, positive) found between exposure to child work and specific outcomes, as well as the strength of the causal conclusions (paper with one star * are weak causal identification studies, ** are strong causal identification studies), for each research paper included in the present literature review.

Summary of findings on the effect of child work on education

Title	Effect
School attendance	
Assaad, R., Levison, D., & Dang, H.-A. (2010) *	Negative effect
Beegle, K., Dehejia, R., & Gatti, R. (2009)**	Negative effect
Boozer, M. A., & Suri, T. K. (2001) **	Negative effect
Ray, R., & Lancaster, G. (2005) *	Negative effect
Cardoso, A. R., & Verner, D. (2006) *	Negative effect
School enrolment / Years of schooling	
Beegle, K., Dehejia, R. H., Gatti, R., & Krutikova, S. (2008) **	Negative effect
Sugiyanto, E., & Digidowiseiso, K. (2019) *	Negative effect on enrolment. No effect on duration on schooling.
Lee, J. C., & Staff, J. (2007) *	Negative effect on the probability of dropping out of school.
Zabaleta, M. B. (2011) *	Negative effect on educational attainment beyond 3 hours of work/day. Positive effect on educational attainment up to 3 hours of work/day.
School performance	
Bezerra, M. E. G., Kassouf, A. L., & Arends-Kuenning, M. (2009)*	Negative effect
Delprato, M., & Akyeampong, K. (2019)*	Negative effect
Emerson, P. M., Ponczek, V., & Souza, A. P. (2017)*	Negative effects
Gunnarsson, V., Orazem, P. F., & Sánchez, M. A. (2006)*	Negative effect
Kassouf, A. L., Tiberti, L., & Garcias, M. (2020)*	Negative effect
Lee, J., Kim, H., & Rhee, D.-E. (2021)*	Negative effect
Woldehanna, T., Gebremedhin, A., & Araya, M. W. (2017)*	Negative effect
Sim, A., Suryadarma, D., & Suryahadi, A. (2017)*	Negative effect on mathematics skills but no effect on educational attainment and cognitive skills.
Mavrokonstantis, P. (2011) *	Negative effect in urban areas, no effect in rural areas
Dumas, C. (2012)*	Positive effects on oral and mathematics scores. No significant effect on written scores
Adult earnings	
Lambon-Quayefio, M. P., & Owoo, N. S. (2018)*	Negative effect
Posso, A. (2017)*	Negative effect
Emerson, P. M., & Souza, A. P. (2011)*	Negative effect if the respondent started working before 13-14 years old. Positive effect on adult earnings from adolescent labor (after 13-14 y.o.)

Summary of findings of the effect of child work on health

Title	Main findings
Child's health status	
Ahmed, S., & Ray, R. (2014)*	Negative effect
Wolff, F. C. & Maliki (2008)**	Negative effect
Nicolella, A., & Kassouf, A. L. (2018)*	Negative effect
Posso, Alberto. (2019)**	Negative effect
O'Donnell, O., Rosati, F. C., & Van Doorslaer, E. (2005)**	No effect
Beegle, K., Dehejia, R., & Gatti, R. (2009)**	No effect
Anthropometric indicators	
O'Donnell, O., Rosati, F. C., & Van Doorslaer, E. (2005)**	No effect
Beegle, K., Dehejia, R., & Gatti, R. (2009)**	No effect
Adult health	
Lee, C., & Orazem, P. F. (2010)**	Negative effect
Rosati, F., & Straub, R. (2007)**	Negative effect
Nishijima, M., Souza, A. P. F. D., & Sarti, F. M. (2015)*	Negative effect
Mental health status	
Aransiola TJ, Justus M. (2018)*	Negative effect
Baryshnikova, N.V., Cheng T.C. and Jayawardana D.G. (2020)*	Negative effect
Feeny, S., Posso, A., Skali, A., Jyotishi, A., Nath, S., & Viswanathan, P. K. (2021)*	Negative effect
Trinh, T. A. (2020)**	Negative effect

Gaps in the literature

This review of literature uncovered several methodological challenges and gaps in the body of evidence available (see Appendix 3 for an extensive discussion on this topic). The first relates to measurement issues due to the methodologies used to measure health and education outcomes, which in many cases still suffer from bias. The second relates to the outcomes examined, with several relevant areas remaining under-studied.

Type and intensity of work

None of the studies reviewed in this document focused on a particular sector of activity, such as agriculture, services, or industry. As a result, the findings generally relate to a substantial sample mixing children involved in different types of work in different sectors. Therefore, it is challenging to analyse the impact of different types of child work on education or health. Similarly, the data used in such studies usually provides insufficient detail to differentiate between permissible light work and hazardous child labour. To better understand the consequences of child work according to its type, intensity, and other characteristics, it seems crucial to conduct causal studies using data with more granularity about the type of work performed by children. This would allow for a better understanding of the effect of child work in more specific contexts and for more effective and better-targeted policies.

Second, we are unable to observe some cumulative effects of child work, since the measures used for child work are usually either binary: whether the child works or not, or categorical: the child either does not work, does market work, or does household chores. The accumulation of two distinct types of work is rarely considered, yet in practice, many children combine market and domestic work.

Non-cognitive skills

In general, the literature on the consequences of child work omits non-cognitive skills, which are important determinants of education and health outcomes in both the short and long term. Non-cognitive skills include dimensions such as perseverance, motivation, time preference, risk aversion, self-esteem, self-control, preference for leisure. An emerging literature shows that non-cognitive skills can be impacted by the environment during childhood (Heckman, 2007; Cunha and Heckman, 2007). These skills are likely to be influenced, in positive or negative ways, by working and the type and intensity of work performed. Moreover, due to the direct link with education and health performance, one should also investigate whether and how these skills could mitigate the harmful effects of child work. One recent exception is Trinh (2020) who studies whether child work impacts the emotional and behavioural development of children. This study shows that peer problems and prosocial behaviour are found to be significantly impacted by working. According to the author, children who engage in the labour market will have less time for other activities, including social activities, resulting in a higher probability of having behavioural problems.

Gender

Too few studies distinguish between girls and boys. Yet, the consequences of working are likely to be quite different depending on the gender of the child. First, boys and girls do different types of work. For instance, boys are more likely to undertake activities in agriculture (62.8% for boys versus 37.2% for girls according to the ILO), while girls are more likely to perform household chores. Often, this division of tasks leads to an underestimation of girls' work when using the standard definitions of child work (i.e. the performance of economic activities). Gender can also determine the conditions, the exposure to risks and hazards and hours of work. For example, in the agricultural sector, many girls face the double burden of performing household chores (for example, cleaning, cooking, childcare, collecting water and firewood), combined with agricultural activities, such as sowing, harvesting and livestock holdings. In many societies, gender roles also dictate education, partially due to different returns to education for boys and girls, and opportunities to access healthcare, partially due to social norms. The consequences of child work should be examined by running separate regressions for boys and girls, or by interacting the gender dummy with the child work explanatory variable.

References

- Ahad, M., Parry, Y. K., Willis, E., et al. (2020). Spillover trends of child labor during the coronavirus crisis - an unnoticed wake-up call. *Frontiers in Public Health*, 8:488.
- Ahmed, S. and Ray, R. (2014). Health consequences of child labour in bangladesh. *Demographic research*, 30:111–150.
- Al-Gamal, E., Hamdan-Mansour, A. M., Matrouk, R., and Nawaiseh, M. A. (2013). The psychosocial impact of child labour in Jordan: A national study. *International Journal of Psychology*, 48(6):1156–1164.
- Aransiola, T. J., Justus, M., et al. (2018). Child labor hazard on mental health: Evidence from Brazil. *J Ment Health Policy Econ*, 21(2):49–58.
- Assaad, R., Levison, D., and Dang, H.-A. (2010). How much work is too much? effects of child work hours on schooling—the case of Egypt. In *Child Labor and the Transition between School and Work*. Emerald Group Publishing Limited.
- Baland, J.-M. and Robinson, J. A. (2000). Is child labor inefficient? *Journal of Political Economy*, 108(4):663–679.
- Bandeali, S., Jawad, A., Azmatullah, A., Liaquat, H. B., Aqeel, I., Afzal, A., Umal, A., Abidi, K., and Israr, S. (2008). Prevalence of behavioural and psychological problems in working children. *Journal of the Pakistan Medical Association*, 58(6):345.
- Baryshnikova, N.V., C. T. and D.G., J. (2020). The long shadow of child labor on adolescent mental health, child wellbeing and economic development: Evidence from Indonesia. *PD thesis*, page 90.
- Basu, K. and Van, P. H. (1998). The economics of child labor. *American economic review*, pages412–427.
- Beegle, K., Dehejia, R., and Gatti, R. (2009). Why should we care about child labor? the education, labor market, and health consequences of child labor. *Journal of Human Resources*, 44(4):871– 889.
- Beegle, K., Dehejia, R. H., Gatti, R., and Krutikova, S. (2008). The consequences of child labor: evidence from longitudinal data in rural Tanzania. *World Bank Policy Research Working Paper*, (4677)
- Bezerra, M. E. G., Kassouf, A. L., and Arends-Kuenning, M. (2009). The impact of child labor and school quality on academic achievement in Brazil. Technical report, IZA Discussion Papers.
- Bhalotra, S. and Heady, C. (2003). Child farm labor: The wealth paradox. *The World Bank Economic Review*, 17(2):197–227.
- Bharadwaj, P., Lakdawala, L. K., & Li, N. (2020). Perverse consequences of well intentioned regulation: Evidence from India's child labor ban. *Journal of the European Economic Association*, 18(3), 1158-1195.
- Black, M. M., Walker, S. P., Fernald, L. C., Andersen, C. T., DiGirolamo, A. M., Lu, C., McCoy, D. C., Fink, G., Shawar, Y. R., Shiffman, J., et al. (2017). Early childhood development coming of age: science through the life course. *The Lancet*, 389(10064):77–90.

- Blattman, C. and Annan, J. (2010). The consequences of child soldiering. *The review of economics and statistics*, 92(4):882–898.
- Boozer, M. and Suri, T. (2001). Child labor and schooling decisions in Ghana. *Mimeograph, Yale University*.
- Bourdillon, M. (2017). Ignoring the benefits of children's work: Beyond trafficking and slavery. *Open Democracy*. *Open Democracy*.
- Bourguignon, F., Ferreira, F. H., and Leite, P. G. (2003). Conditional cash transfers, schooling, and child labor: Micro-simulating Brazil's bolsa escola program. *The World Bank Economic Review*, 17(2):229–254.
- Breslin, C., Koehoorn, M., Smith, P., and Manno, M. (2003). Age related differences in work injuries and permanent impairment: a comparison of workers' compensation claims among adolescents, young adults, and adults. *Occupational and environmental medicine*, 60(9):e10–e10.
- Caplan, R. D. and Jones, K. W. (1975). Effects of work load, role ambiguity, and type a personality on anxiety, depression, and heart rate. *Journal of applied psychology*, 60(6):713.
- Cardoso, A. R. and Verner, D. (2006). School drop-out and push-out factors in Brazil: The role of fearly parenthood, child labor, and poverty.
- Cunha, F. and Heckman, J. (2007). The technology of skill formation. *American Economic Review*, 97(2):31–47.
- Cutler, D. M. and Lleras-Muney, A. (2006). Education and health: evaluating theories and evidence.
- Dasgupta, P. (1997). Nutritional status, the capacity for work, and poverty traps. *Journal of Econometrics*, 77(1):5–37.
- De Hoop, J., Friedman, J., Kandpal, E., and Rosati, F. C. (2019). Child schooling and child work in the presence of a partial education subsidy. *Journal of Human Resources*, 54(2):503–531.
- DeGraff, D. S., Ferro, A. R., and Levison, D. (2016). In harm's way: Children's work in risky occupations in Brazil. *Journal of International Development*, 28(4):447–472.
- Delprato, M. and Akyeampong, K. (2019). The effect of working on students' learning in Latin America: Evidence from the Learning Survey Terce. *International Journal of Educational Development*, 70:102086.
- Dorman, P. (2008). *Child labour, education and health: A review of the literature*. ILO Geneva.
- Dumas, C. (2012). Does work impede child learning? the case of Senegal. *Economic Development and Cultural Change*, 60(4):773–793.
- Dunne, M., Humphreys, S., and Szyp, C. (2021). Education and work: Children's lives in rural sub-Saharan Africa.
- Edmonds, E. V. (2007). Child labor. *Handbook of development economics*, 4:3607–3709.
- Emerson, P. M., Ponczek, V., and Souza, A. P. (2017). Child labor and learning. *Economic Development and Cultural Change*, 65(2):265–296.
- Emerson, P. M. and Souza, A. P. (2011). Is child labor harmful? the impact of working earlier in life on adult earnings. *Economic development and cultural change*, 59(2):345–385.

- Etzel, R. A. (2020). The special vulnerability of children. *International journal of hygiene and environmental health*, 227:113516.
- Evans, T., Whitehead, M., Bhuiya, A., Diderichsen, F., and Wirth, M. (2001). *Challenging in- equities in health: from ethics to action*. Oxford University Press.
- Fassa, A. G. (2003). *Health benefits of eliminating child labour*. International Labour Office Geneva.
- Fassa, A. G., Facchini, L. A., Dall'Agnol, M. M., and Christiani, D. C. (2000). Child labor and health: problems and perspectives. *International Journal of Occupational and Environmental Health*, 6(1):55–62.
- Feeny, S., Posso, A., Skali, A., Jyotishi, A., Nath, S., and Viswanathan, P. (2021). Child labor and psychosocial wellbeing: Findings from India. *Health Economics*, 30(4):876–902.
- Fekadu, D., Alem, A., and Hägglöf, B. (2006). The prevalence of mental health problems in Ethiopian child laborers. *Journal of Child psychology and psychiatry*, 47(9):954–959.
- Ferreira, F. H., Filmer, D., and Schady, N. (2017). *Own and sibling effects of conditional cash transfer programs: theory and evidence from Cambodia*. Emerald Publishing Limited.
- Forastieri, V. (1997). Children at work. *Health and safety risks*, pages 13–15.
- Franke, H. A. (2014). Toxic stress: effects, prevention and treatment. *Children*, 1(3):390–402.
- Gazeaud, J. and Ricard, C. (2021). Conditional cash transfers and the learning crisis: evidence from tayssir scale-up in Morocco.
- Grossman, M. (2000). Chapter 7 the human capital model. *Handbook of health economics*, 1(Part A):347–408.
- Grossman, M. (2015). The relationship between health and schooling: What's new? Technical report, National Bureau of Economic Research.
- Gunnarsson, V., Orazem, P. F., and Sánchez, M. A. (2006). Child labor and school achievement in Latin America. *The World Bank Economic Review*, 20(1):31–54.
- Hammen, C. (2005). Stress and depression. *Annu. Rev. Clin. Psychol.*, 1:293–319.
- Hazarika, G. and Bedi, A. (2003). Schooling costs and child work in rural Pakistan. *The Journal of Development Studies*, 39(5):29–64.
- Heckman, J. J. (2007). The economics, technology, and neuroscience of human capability formation. *Proceedings of the national Academy of Sciences*, 104(33):13250–13255.
- Horwitz, A. V., Widom, C. S., McLaughlin, J., and White, H. R. (2001). The impact of childhood abuse and neglect on adult mental health: A prospective study. *Journal of health and social behavior*, pages 184–201.
- Ibrahim, A., Abdalla, S. M., Jafer, M., Abdelgadir, J., and De Vries, N. (2019). Child labor and health: a systematic literature review of the impacts of child labor on child's health in low-and middle-income countries. *Journal of Public Health*, 41(1):18–26.
- Idler, E. L. and Benyamini, Y. (1997). Self-rated health and mortality: a review of twenty-seven community studies. *Journal of health and social behavior*, pages 21–37.
- Idris, I. (2020). Impact of covid-19 on child labour in south Asia
- ILO, U. (2021). Child labour: Global estimates 2020, trends and the road forward. *Report*.

Jouvin, M. et al. (2021). Addressing social desirability bias in child labor measurement: an application to cocoa farms in Côte d'Ivoire. Technical report, Groupe de Recherche en Economie Théorique et Appliquée (GREThA).

Kana, M., Phoumin, H., and Seiichi, F. (2010). Does child labour have a negative impact on child education and health? A case study in rural Cambodia. *Oxford Development Studies*, 38(3):357–382.

Kaplan, G. A. and Camacho, T. (1983). Perceived health and mortality: a nine-year follow-up of the human population laboratory cohort. *American journal of epidemiology*, 117(3):292–304.

Kassouf, A. L., Tiberti, L., and Garcias, M. (2020). Evidence of the impact of children's household chores and market labour on learning from school census data in Brazil. *The Journal of Development Studies*, 56(11):2097–2112.

Knudsen, E. I., Heckman, J. J., Cameron, J. L., and Shonkoff, J. P. (2006). Economic, neurobiological, and behavioral perspectives on building America's future workforce. *Proceedings of the national Academy of Sciences*, 103(27):10155–10162.

Kochar, A. (1999). Smoothing consumption by smoothing income: hours-of-work responses to idiosyncratic agricultural shocks in rural India. *Review of Economics and Statistics*, 81(1):50–61.

Kremer, M., Brannen, C., and Glennerster, R. (2013). The challenge of education and learning in the developing world. *Science*, 340(6130):297–300.

Lambon-Quayefio, M. P. and Owoo, N. S. (2018). Child labour, future earnings and occupation choice: evidence from Ghana. *International Journal of Social Economics*.

Lee, C. and Orazem, P. F. (2010). *Lifetime health consequences of child labor in Brazil*. Emerald Group Publishing Limited.

Lee, J., Kim, H., and Rhee, D.-E. (2021). No harmless child labor: The effect of child labor on academic achievement in francophone western and central Africa. *International Journal of Educational Development*, 80:102308.

Lee, J. C. and Staff, J. (2007). When work matters: The varying impact of work intensity on high school dropout. *Sociology of Education*, 80(2):158–178.

Levison, D. and Murray-Close, M. (2005). Challenges in determining how child work affects child health. *Public Health Reports*, 120(6):614–620.

Manacorda, M. (2006). Child labor and the labor supply of other household members: Evidence from 1920 America. *American Economic Review*, 96(5), 1788–1801.

Mavrokonstantis, P. (2011). The impact of child labour on educational attainment: Evidence from Vietnam. *Young Lives Student Paper, Oxford: Young Lives*.

Monroe, S. M., Slavich, G. M., Torres, L. D., and Gotlib, I. H. (2007). Major life events and major chronic difficulties are differentially associated with history of major depressive episodes. *Journal of abnormal psychology*, 116(1):116.

Mortimer, J. T. (2010). The benefits and risks of adolescent employment. *The prevention researcher*, 17(2):8.

Moya, J., Bearer, C. F., and Etzel, R. A. (2004). Children's behavior and physiology and how it affects exposure to environmental contaminants. *Pediatrics*, 113(Supplement 3):996–1006.

- Nicolella, A. and Kassouf, A. L. (2018). The effect of child labour on children's health in Brazil. *International Journal of Social Economics*.
- Nishijima, M., Souza, A. P. F. d., and Sarti, F. M. (2015). Trends in child labor and the impact on health in adulthood in Brazil from 1998 to 2008. *Cadernos de saude publica*, 31:1071–1083.
- O'Donnell, O., Rosati, F. C., and Van Doorslaer, E. (2005). Health effects of child work: Evidence from rural Vietnam. *Journal of Population Economics*, 18(3):437–467.
- Parker, D. (1997). Health effects of child labor. *The Lancet*, 350(9088):1395–1396.
- Pikhart, H., Bobak, M., Pajak, A., Malyutina, S., Kubinova, R., Topor, R., Sebakova, H., Nikitin, Y., and Marmot, M. (2004). Psychosocial factors at work and depression in three countries of central and eastern Europe. *Social science & medicine*, 58(8):1475–1482.
- Pitt, M. M., Rosenzweig, M. R., and Hassan, M. N. (1990). Productivity, health, and inequality in the intrahousehold distribution of food in low-income countries. *The American Economic Review*, pages 1139–1156.
- Posso, A. (2017). Child labor's effect on long-run earnings: An analysis of cohorts. *Economic Modelling*, pages 465–472.
- Posso, A. (2019). The health consequences of hazardous and nonhazardous child labor. *Review of Development Economics*, 23(2):619–639.
- Pritchett, L. (2013). *The rebirth of education: Schooling ain't learning*. CGD Books.
- Ravallion, M. and Wodon, Q. (2000). Does child labour displace schooling? evidence on behavioural responses to an enrollment subsidy. *The economic journal*, 110(462):158–175.
- Ray, R. and Lancaster, G. (2005). The impact of children's work on schooling: Multi-country evidence. *Int'l Lab. Rev.*, 144:189.
- Rosati, F. and Straub, R. (2007). Does work during childhood affect the health of Guatemalan adults? *Review of Economics of the Household*, 5(1):83–94.
- Sadana, R., Mathers, C. D., Lopez, A. D., Murray, C. J., and Iburg, K. (2002). Comparative analyses of more than 50 household surveys on health status. *Summary measures of population health: Concepts, ethics, measurement, and applications*, pages 369–86.
- Shafiq, M. N. (2007). Household schooling and child labor decisions in rural Bangladesh. *Journal of Asian Economics*, 18(6):946–966.
- Sim, A., Suryadarma, D., and Suryahadi, A. (2017). The consequences of child market work on the growth of human capital. *World Development*, 91:144–155.
- Steckel, R. H. (1995). Stature and the standard of living. *Journal of economic literature*, 33(4):1903–1940.
- Strauss, J. and Thomas, D. (1998). Health, nutrition, and economic development. *Journal of economic literature*, 36(2):766–817.
- Sugiyanto, E. and Digidowiseiso, K. (2019). Do incidence and duration of child labour matter on schooling in Indonesia? *International Journal of Education Economics and Development*, 10(1):22–35.
- Thévenon, O. and Edmonds, E. (2019). Child labour: Causes, consequences and policies to tackle it.

Tottenham, N. and Galván, A. (2016). Stress and the adolescent brain: Amygdala-prefrontal cortex circuitry and ventral striatum as developmental targets. *Neuroscience & Biobehavioral Reviews*, 70:217–227.

Trinh, T.-A. (2020). Mental health impacts of child labour: evidence from Vietnam and India. *The Journal of Development Studies*, 56(12):2251–2265.

Van der Noordt, M., IJzelenberg, H., Droomers, M., and Proper, K. I. (2014). Health effects of employment: a systematic review of prospective studies. *Occupational and environmental medicine*, 71(10):730–736.

Woldehanna, T., Gebremedhin, A., and Araya, M. W. (2017). Is child work detrimental to the educational achievement of children? results from young lives study in Ethiopia. *Ethiopian Journal of Economics*, 26(1):123–151.

Wolff, F.-C. et al. (2008). Evidence on the impact of child labor on child health in Indonesia, 1993–2000. *Economics & Human Biology*, 6(1):143–169.

Yadav, S. K. and Sengupta, G. (2009). Environmental and occupational health problems of childlabour: Some issues and challenges for future. *Journal of Human Ecology*, 28(2):143–148.

Zabaleta, M. B. (2011). The impact of child labor on schooling outcomes in Nicaragua. *Economics of Education Review*, 30(6):1527–1539.

Zietz, S., de Hoop, J., and Handa, S. (2018). The role of productive activities in the lives of adolescents: Photovoice evidence from Malawi. *Children and youth services review*, 86:246–255.

Appendices

[Appendix A: Selection and inclusion criteria](#)

[Appendix B: List of studies included by thematic area](#)

[Appendix C: Methodology and main results of selected studies](#)

[Appendix D: Methodological considerations regarding the attribution of a causal relationship between child work and potential negative outcomes](#)