

How the COVID-19 Pandemic Eroded Human Capital and What to Do about It

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Executive Summary

COLLAPSE and **RECOVERY**

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Human Capital and What to Do about It**

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MAIN MESSAGES

Worldwide, COVID-19 (coronavirus) was an enormous shock to health, economies, and daily life. But what has yet to be fully acknowledged is the pandemic's impact on young people's trajectories through life. Indeed, it is a ticking time bomb.

This report focuses on human capital—the health, knowledge, and skills that people accumulate over their lifetime. Often, it is the only asset poor people have and is what determines a person's productivity and earnings. Human capital trajectories are set during childhood, adolescence, and early adulthood. Shocks like the COVID-19 pandemic reduce both the levels of human capital and the subsequent rates of accumulation. If losses continue to be unaddressed, both lifetime earnings and economic growth will decline for decades to come. Losses will also increase inequality.

COVID-19 knocked individuals off course at critical moments in their lives. This report estimates the impacts of the pandemic on the human capital of young children (0–5), school-age children (6–14), and youth (15–24) and discusses the urgent actions needed to reverse the damage.

What was the pandemic's impact on people 24 years of age and younger? Early childhood is a critical period for brain development and lays the foundations for skills such as literacy and mathematics. Because of the pandemic, very young children missed essential vaccinations and stopped going to preschool. There was also unprecedented stress in families. The declines observed in cognitive and social-emotional development are alarming. In Bangladesh, for example, toddlers tested in 2022 lagged far behind toddlers tested in 2019. The observed declines, unless remedied, could translate into a 25 percent reduction in earnings when these children are adults.

The pandemic also resulted in school closures everywhere. Nearly 1 billion children in low- and middle-income countries missed at least one year of in-person schooling. And despite enormous efforts in remote learning, the data reveal that children did not learn during the closures. On average, each month of school closure led to one month of lost learning. For some students, losses were even greater because many forgot things they had already learned. The learning losses observed today could reduce future earnings around the world by US\$21 trillion.

Youth is another crucial stage in the life cycle. At this stage, young people are making important decisions such as whether to stay in school, work, or raise a family. COVID-19 led to dramatic drops in employment and a worse transition for young people into the labor market. The number of youth neither employed nor enrolled in education or training increased substantially. In Pakistan alone, the pandemic created 1.6 million additional idle youth. Moreover, in several countries analyzed there was little sign of recovery after 18 months. Being unemployed or holding a low-paying job when one first enters the labor market can result in “scarring.” Evidence suggests that scarring can last for up to 10 years.

In all these stages—early childhood, school age, and youth—the impacts of the pandemic were consistently worse for children from poorer backgrounds. The pandemic could therefore increase inequality between and within countries. All age groups also suffered marked declines in mental health.

These losses are a call for action. People who were under the age of 25 when the pandemic hit will make up 90 percent of the prime-age workforce of 2050. Faced with this true collapse in human capital, what can countries do? The good news is that there are evidence-proven strategies to recover these losses. Extending the coverage of pre-primary education and improving its content are good examples. Both would have short-term benefits, helping children become more prepared to learn. Over the long term, they have been shown to increase college attendance and earnings. They have even been shown to lower the propensity to commit crime.

For school-age children, simply having them back in school will not be enough. A child who stopped going to school in second grade and stayed home for a year will not be able to follow a fourth-grade curriculum. It will be important to match instruction to these students' levels of learning. Increasing instructional time and catch-up programs—such as tutoring—can also reverse learning losses.

Youth need help for a good start in the labor market. For countries in which youth employment has not yet recovered, training, entrepreneurship programs adapted for youth, and apprenticeships are particularly important.

All of these programs—across all three life stages—will not just address human capital losses. When higher individual earnings and tax revenue and a lower need for social assistance are factored in, most of these programs targeting children and youth end up paying for themselves and have higher returns than those targeting adults.

To address losses in human capital and better prepare for future shocks such as climate change, wars, and recessions, a new approach is needed, and it requires political will to act. In some cases, interventions in health will be most appropriate to address specific losses in human capital. In others, it may be that policies in education or social protection are the most effective. In the majority of cases, however, solutions that bring these sectors together into a human development system are needed. Evidence suggests that during the COVID-19 crisis very few countries responded with integrated approaches, and most lacked the capacity to collect and link data from programs in different sectors. This must change.

Faced with other global pressures and fiscal constraints, some countries may find the list of policy options too long. This report sets out an approach to help countries prioritize their options. It emphasizes the importance of targeting recovery policies to children who are about to transition or just transitioned to a subsequent stage in the life cycle. These defining moments can create skill deficits that interfere with the entire trajectory of human capital accumulation.

This report also provides estimates of the full cost of each proposed policy. This cost includes fiscal costs as well as costs stemming from implementation complexity and political commitment. It highlights that many of the proposed policies do not require important fiscal efforts. Rather, they require institutional capacity building and political will.

It is nearly impossible to overstate the severity of COVID-19's impact on young people. If countries fail to act now, the losses documented in this report will become permanent and last for multiple generations. Starting now is critical.

EXECUTIVE SUMMARY



Everybody is eager to return to normal ... but normal is not enough.

—Thomas Kane, Center for Education Policy Research, Harvard University
“All Things Considered,” National Public Radio, June 22, 2022



COVID-19 (coronavirus), first detected in Wuhan, China, in late December 2019, spread around the world, culminating in a global health emergency. It was quickly followed by a deep economic contraction in virtually every country. The world tumbled into recession, and the overall global gross domestic product (GDP) shrank by 4.3 percent in 2020.

These figures hide immense human suffering. By December 2021, there were 14.9 million excess deaths globally—deaths attributable to the pandemic.¹ Poverty increased dramatically. There were 70 million more people living in extreme poverty in 2020 than in 2019—an 11 percent increase. To put things in context, this increase in extreme poverty is roughly four times larger than the spike in poverty during the Asian financial crisis of 1997–98.²

The consequences of the pandemic, however, were not limited to its effects on mortality, economic growth, or poverty. Households were ridden with stress. Mental illness, domestic violence, teen pregnancy, and early marriage spiked in some settings. Millions of children lost a caregiver or were orphaned. Many more missed out on vital nutrition and health care and suffered declines in early childhood development. Nearly 1 billion children missed a year or more of schooling and learned little, if anything, while schools were closed. Tens of millions of young people were shut out of the job market or entered it with fewer skills and diminished prospects. Taken together, these effects represent a profound loss of human capital. Unless they are reversed, these losses will lead to declines in productivity and earnings as the children and youth of today become the labor force of tomorrow.

The erosion of human capital from the pandemic—and what to do about it—are the subjects of this report. Although many of the consequences of the pandemic may not fully emerge for years (or even decades),

this report presents solid evidence of the impacts of the pandemic to date. It assesses the impact of the pandemic using new individual- and household-level data from low- and middle-income countries and reviews the existing literature. It extracts lessons from actions and policies implemented around the world in response to the pandemic, as well as past evidence on program effectiveness. Moreover, the report recommends concrete policies for the short and medium term that will help recover human capital losses from the pandemic and prepare for future shocks.

It is useful to start with a working definition of human capital. *Human capital* refers to the health, skills, knowledge, and experience that people accumulate over their lifetime. Not just of intrinsic value, these attributes also make people more productive. Or, put differently, human capital is wealth embodied in people. Indeed, for many poor people around the world, their human capital is the *only* important source of wealth they have.

Building human capital requires sustained investments along multiple dimensions. The process is *sequential* and *cumulative*: skills build on earlier skills, and current skills beget future skills.³ Although human capital can be acquired over an entire lifetime, it is built most effectively when people are young. There are a variety of reasons for this, including greater brain plasticity at early ages and the fact that younger people are generally expected to engage in activities that deliberately build skills (such as formal schooling). Any disruption to the process of building human capital can have long-lasting effects. There is evidence from earlier crises that the effects of shocks to human capital can reverberate across multiple generations.

Human capital losses not only affect individuals through declines in their future earnings. They also can have negative economywide effects. Human capital is one of the main drivers of economic growth, and so, anything that erodes it, could result in lower growth rates for many years to come. Indeed, the long-term costs of the pandemic—working through the reductions in human capital caused by the pandemic—are likely to dwarf the short-term costs.⁴

The erosion of human capital from the pandemic was greatest among poorer households. This erosion could lead to a sharp increase in inequality in the future—an increase that would compound the rising inequality already observed in many countries in recent decades. Lower wages, more poverty, more inequality, and less growth are an explosive mix.

So what should be done? After quantifying the present collapse of human capital among young people under the age of 25, this report describes interventions that governments must put in place quickly to limit and reverse the damage. Concrete examples illustrate that recovery is possible if the right actions are taken. However, if countries fail to prioritize these efforts, they risk having multiple lost generations of children and young people—the workforce of tomorrow. The time to act is short.

And what should governments do now to better prepare for systemic shocks in the future? The report also discusses the kinds of agile, resilient, and adaptive human development systems that need to be in place for a country to respond to future shocks, whether an epidemic (or pandemic), a natural disaster, or an aggregate economic crisis. This is truly a case in which an ounce of prevention is worth a pound of cure, and where the costs of not preparing can be enormous.

THE PANDEMIC DESTROYED HUMAN CAPITAL AT CRITICAL MOMENTS IN THE LIFE CYCLE

The pandemic led to a sharp decline in human capital at critical stages of the life cycle. This report focuses on changes in human capital during early childhood (0–5 years), among school-age children (6–14 years), and in early adulthood (15–24 years). People younger than 25 today—those most affected by the erosion of human capital—will make up 90 percent of the prime-age workforce in 2050.⁵

Poor start: The impact of the COVID-19 pandemic on early childhood development

The first five years of life are a period of rapid brain development and physical growth. Early life experiences shape both the architecture and functions of the brain and can even modify which genes are expressed.⁶

Learning during these early years is the foundation for later learning, as children begin to learn about numbers, language, and social interactions and develop executive functions such as inhibition and working memory.⁷ Early nutrition and health also determine physical and mental health and cognitive skills later in life.

The pandemic led to sharp reductions in critical inputs for child development. In many countries, as household incomes shrank and lockdowns made it difficult for households to access markets, food insecurity increased. Compared with 2019, the share of households reporting smaller food portions for children increased dramatically in 2020—by 68 percent in Sierra Leone, 69 percent in Kenya, and 100 percent in Bangladesh.⁸

Concurrently, lockdowns and restrictions on movement, fears of infection in the community, and shortages of frontline health care staff led to declines in the use of health services critical for children. Some of these declines occurred even before children were born. Relative to the levels observed in 2019, births in hospitals and clinics fell by more than 14 percent in Nigeria and 25 percent in Haiti. This is a concern because births not attended by health staff have a higher risk of complications and death for mothers and their children, and complications in birth can also result in disabilities in childhood and adulthood. In addition, millions of young children were not fully vaccinated against diphtheria, pertussis, and tetanus in 2020, thereby reversing approximately 10 years of global progress in combating preventable diseases.⁹

The quality of the home environment experienced by young children deteriorated sharply during the pandemic. One recent study estimates that by May 2022, at least 7.5 million children had been orphaned by the pandemic, with the largest numbers in Sub-Saharan Africa and South Asia.¹⁰ Moreover, even in the absence of death, the pandemic led to a decline in the mental health of mothers and a rise in the proportion of young children subjected to harsh corporal punishment—both of which are predictive of worse child outcomes.¹¹

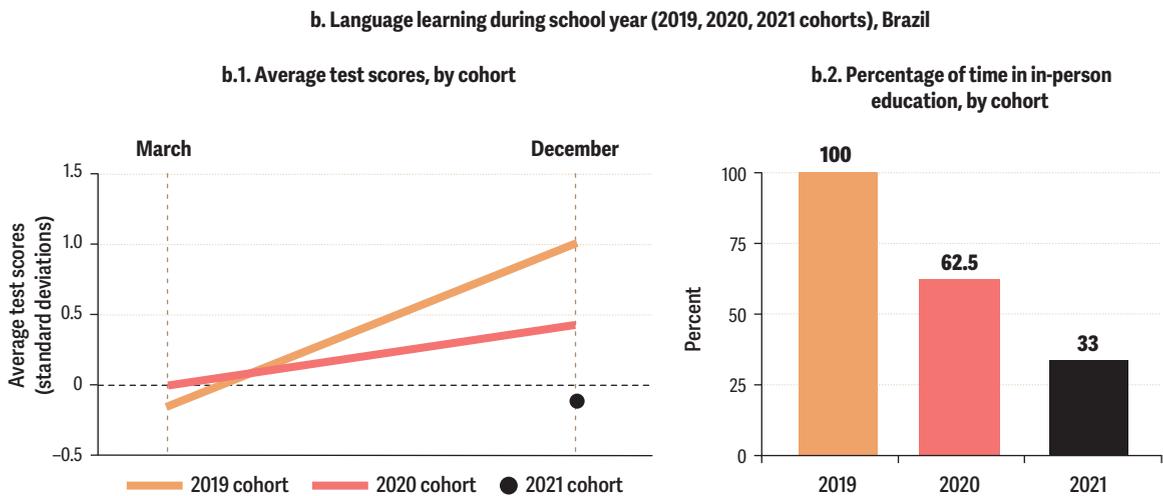
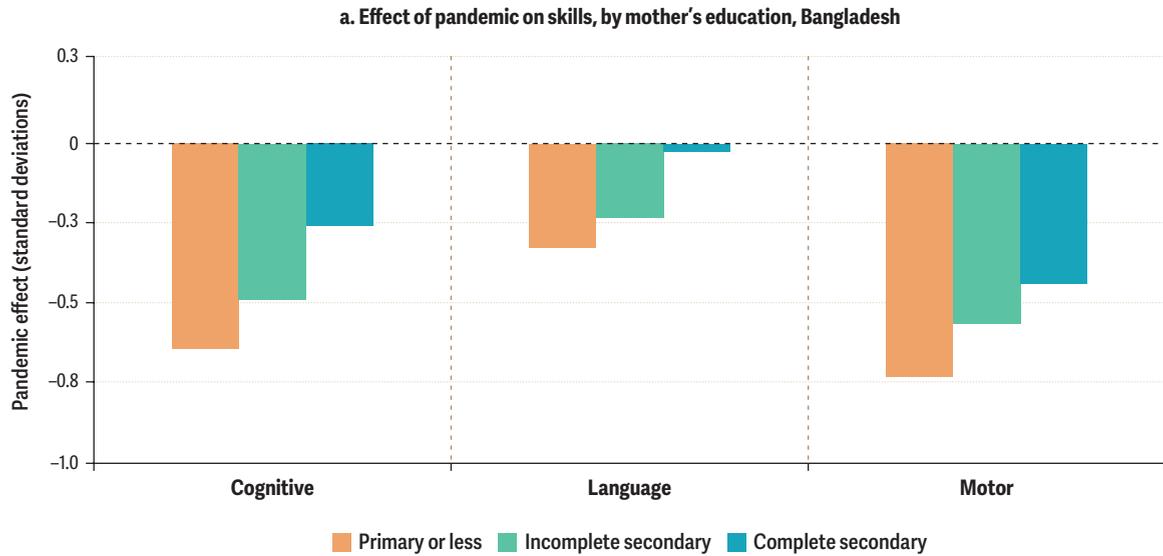
Preschools closed almost universally at the beginning of the pandemic and remained closed for a year or longer in many countries. Even after they reopened, enrollment levels in preschool have continued to be below their pre-pandemic levels in many countries—by between 10 and 15 percentage points in Brazil, Pakistan, and South Africa. Moreover, in countries where the coverage of preschool was high (such as Brazil), the largest losses in preschool coverage occurred among households with low socioeconomic status. Children acquire many skills in preschool, and missing preschool can leave them ill-prepared for the beginning of elementary school and can even reduce their chances of completing high school and moving on to tertiary education.¹²

Data on child development (specifically, cognitive, language, motor, and social-emotional skills) are not collected regularly in most countries, and so little was known about these outcomes in the first months of the pandemic. Nevertheless, the declines in the various contributors to child health and development just discussed were clear cause for concern. Data from a few low- and middle-income countries have now become available, and they are worrisome.

Studies of toddlers in a lower-middle-income country, Bangladesh, and preschool-age children in an upper-middle-income country, Brazil, find large declines in child development and early learning (figure ES.1).¹³ Pandemic-induced losses in cognitive, language, and motor skills in Bangladesh (figure ES.1, panel a) were concentrated among the most vulnerable children, thereby widening preexisting gaps. Nonetheless, effects did not vary by the gender of the child. A simple exercise that uses evidence from a well-known study in Jamaica to “translate” these declines in development into expected reductions in earnings suggests that, unless remediated, young children affected by the pandemic could have earnings in adulthood that, on average, are roughly 25 percent lower than they would have been in the absence of the pandemic.¹⁴ In a sample of preschools from Sobral, Brazil (figure ES.1, panel b), the cohort starting preschool in 2020 learned only two-thirds of what the 2019 cohort had learned over an entire school year. The cohort starting preschool in 2021 could not be assessed at the start of the year (schools were closed), but their test scores at the end of the year (black dot) suggest they lost even more learning than the 2020 cohort.



FIGURE ES.1 The pandemic led to steep losses in early childhood development and early learning in very young children in Bangladesh and Brazil



Sources: Panel a: Hamadani et al, forthcoming. Panel b: Maria Cecilia Souto Vidigal Foundation 2021.
 Note: Panel a: Children are 20 months old. Panel b: Children are in preschool. See chapter 2 for additional figure details.

Learning losses and dropouts: The heavy cost of the COVID-19 pandemic on school-age children

A very large literature, spanning hundreds of studies, shows that schooling—both its quantity (as measured by years of schooling completed) and its quality (as measured by amount of learning)—is a robust predictor of labor market success. Indeed, for millions of people around the world schooling is the only pathway to a better, more prosperous life.

In March 2020, when the pandemic first hit, schools closed in 180 countries. One year later, in March 2021, schools were still partially or fully closed in 94 countries. Overall, 1.3 billion children in low- and middle-income

countries missed at least half a year of school; 960 million missed at least a full year; and 711 million missed a year and a half or more.¹⁵ Schools were closed for a particularly long time in Latin America and the Caribbean and South Asia, but within regions there was considerable variation in the length of school closures. For example, between April 2020 and March 2022, schools were closed for 61 days in Tanzania but 448 days in Uganda; 107 days in Morocco but 326 days in Saudi Arabia; and 47 days in Vietnam but 510 days in the Philippines.

Once school closures went into effect, nearly all education systems pivoted to remote learning. However, remote learning was not accessible to all. Globally, more than two-thirds of children ages 3–17 (1.3 billion children) lack internet access at home.¹⁶ And parents, especially those who themselves have low levels of education, were ill-equipped to help their children. In Indonesia, for example, 29 percent of parents reported that they had insufficient time, and 25 percent reported lacking the capacity to support their children in learning from home.¹⁷ In Bangladesh, 39 percent of students in the bottom socioeconomic quartile received support from a family member, compared with 62 percent in the top quartile.¹⁸

Lengthy school closures had two effects on human capital. First, they led to deep learning losses. In fact, this report shows that one month of school closures led to one month of learning lost, on average. Put differently, little learning occurred while schools were closed, despite widespread remote-learning efforts.

This pattern is evident in panel a of figure ES.2, which summarizes the results from dozens of studies and plots months of learning lost against months of school closures by country. Most countries fall somewhere near the 45-degree line, where months of learning lost are equal to the months of school closures. Overall, for every 30 days of school closures, students lost about 32 days of learning.¹⁹ Across all these studies, the average learning loss was 6.2 months, and the average length of school closures was 5.9 months.

Learning losses seem to have been larger in countries with lower GDP per capita, after controlling for the length of school closures (see panel b of figure ES.2, which plots the ratio of learning loss to school closures against log GDP per capita). Although high-, middle-, and low-income countries all show steep learning losses, the ratio of learning losses to school closures is larger in lower-income countries.²⁰ Therefore, the pandemic exacerbated inequality in learning outcomes because lower-income countries had lower achievement to begin with.

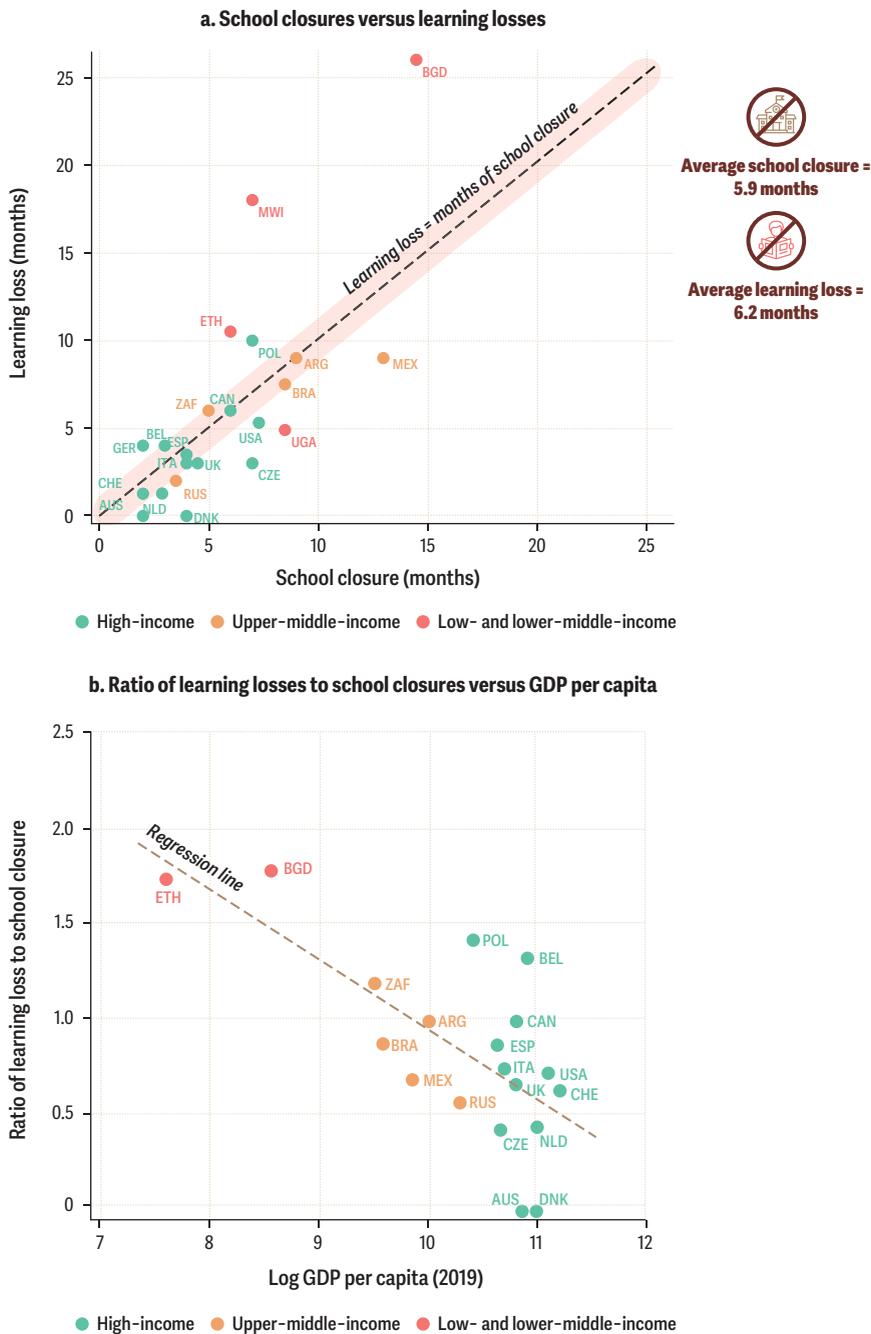
For countries above the 45-degree line in panel a of figure ES.2, months of lost learning were larger than months of school closure. This finding implies that not only was there *forgone* learning—learning that would have occurred had schools remained open—but also *forgotten* learning—erosion of skills children had mastered before schools closed. In Bangladesh, for example, 14.5 months of school closures led to nearly 26 months of learning lost. For example, a 10-year-old girl who knew how to add and subtract at the beginning of the pandemic and was next meant to learn how to multiply and divide did not learn these new skills (*forgone* learning) but also forgot how to add and subtract (*forgotten* learning). This is the stark reality in many countries, especially lower-income ones, and it portends the magnitude of the challenge ahead.

In addition, some children did not return to school even after schools reopened. Student dropouts did not increase notably in upper-middle-income countries, but the picture is different in lower- and lower-middle-income countries. In Ethiopia and Pakistan, for example, school enrollment among children ages 6–14 dropped by 4 percentage points and 6 percentage points, respectively, once schools reopened. Declines in enrollment were similar for boys and girls, but they were substantially larger for children in households in which adults had lower levels of education.

Dropouts are a concern because children who acquire less schooling will have less human capital, be less productive, and earn lower wages. Moreover, it may take time for dropouts to materialize and could become a larger issue if policies are not put in place to limit learning losses. If children cannot keep up with the material taught in class, they will become unmotivated and may eventually leave school. This could occur in any grade, but especially in grades that correspond to the transition from one education level (for example, primary school) to the next (for example, lower-secondary school), when many students abandon school. This is a concern in both upper-middle-income and poorer countries.



FIGURE ES.2 During the pandemic, each month of school closures led to one month of learning losses, and more so in countries with lower GDP per capita



Source: Original calculations for this publication.

Note: See chapter 3 for additional figure details. For country abbreviations, see International Organization for Standardization (ISO), <https://www.iso.org/obp/ui/#search>.

Lost opportunities: The protracted effect of the pandemic on youth and young adults

Youth (ages 15–24) is the period when people make the transition from mainly accumulating to utilizing human capital.²¹ Young people may be in school, employed (whether formally or informally and in high- or low-wage jobs), or idle. They can also engage (or not) in behaviors such as unprotected sex, drug use, criminal activity, and gang membership.

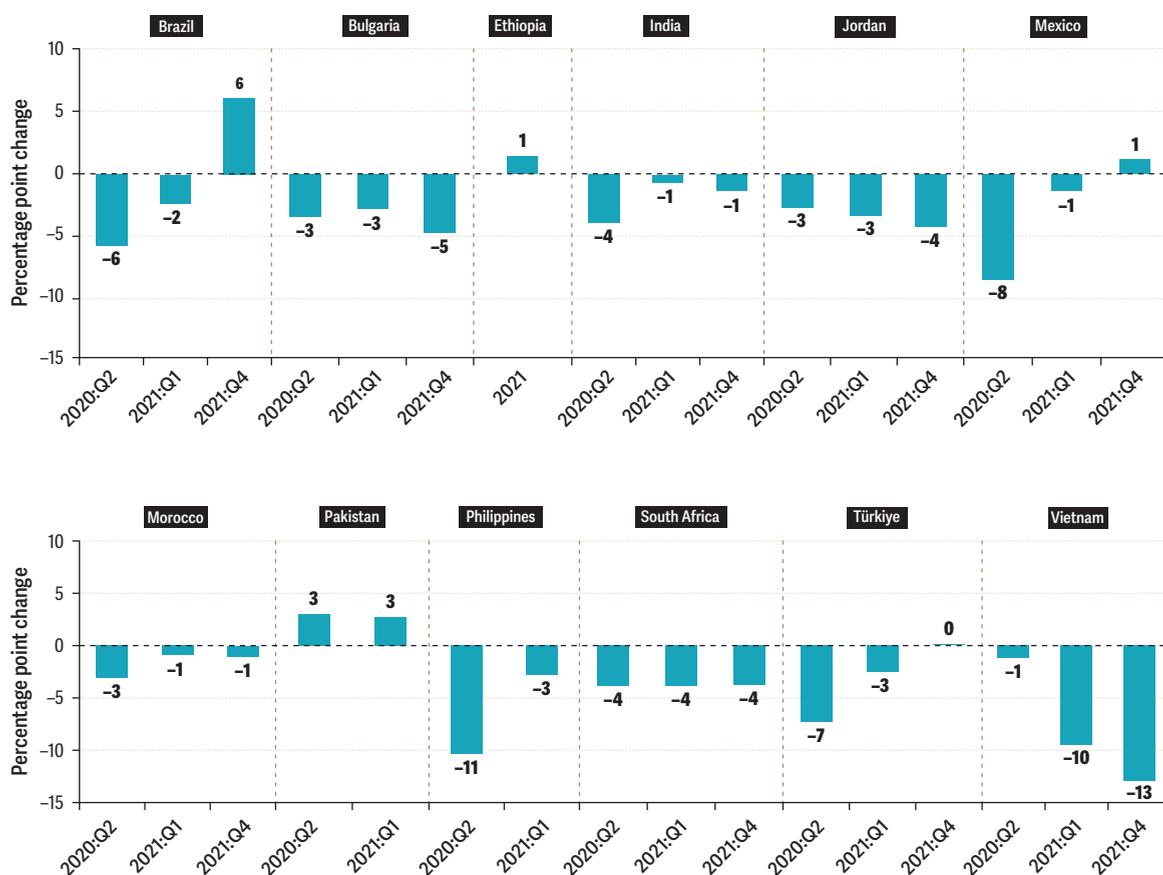
The decisions made by young people have long-term consequences—and the pandemic affected them in critical ways. First, at the outset of the pandemic youth suffered deep employment losses (figure ES.3). In 10 of the 12 countries in the figure ES.3, there was a decline in youth employment in the second quarter of 2020, ranging from 1 percentage point in Vietnam to 11 percentage points in the Philippines. The exceptions are the two lower-income countries in the sample, where youth employment increased—by 1 percentage point in Ethiopia (2021) and by 3 percentage points in Pakistan.

Figure ES.3 also reveals substantial differences in the pattern of recovery. By the end of 2021, youth employment had recovered fully and exceeded pre-pandemic levels in Brazil, Mexico, and Türkiye. On the other hand, there is no evidence of a recovery in South Africa, while in Bulgaria, Jordan, and—especially—Vietnam, youth employment continued to decline throughout 2021. These job losses were compounded by declines in wages for young people in many countries.



FIGURE ES.3 Youth employment fell in most countries during the pandemic

Percentage point change in youth employment (ages 15–24)



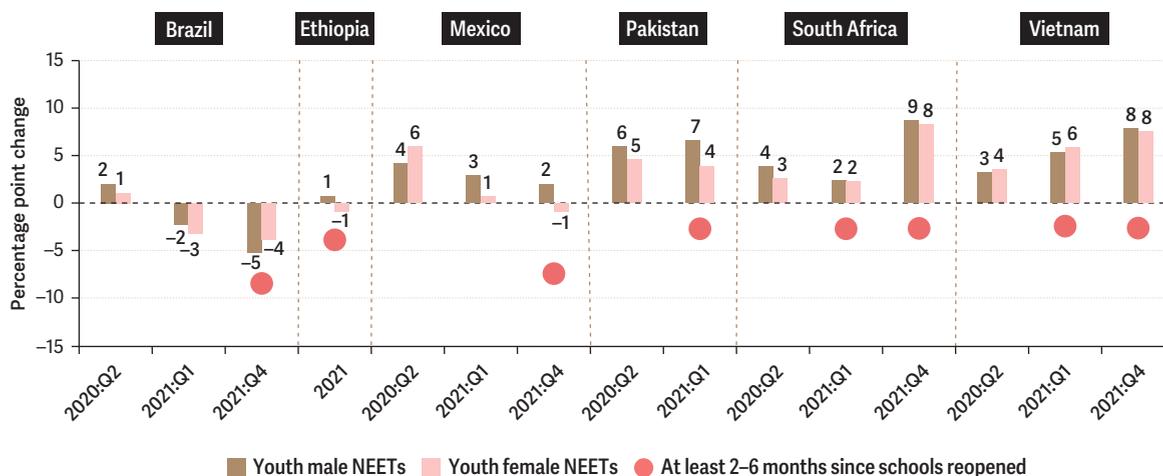
Source: Original calculations for this publication, based on data from labor force surveys.

Note: See chapter 4 for additional figure details. Q = quarter.



FIGURE ES.4 Declines in employment of young people during the pandemic were not offset by increases in schooling or training

Percentage point change in share of youth who were NEETs, by gender



Source: Original calculations for this publication, based on data from labor force surveys.
 Note: See chapter 4 for additional figure details. NEET = Not in Education, Employment, or Training; Q = quarter.

The implications of job losses are very different if young people who, in normal times, would have been employed seek more schooling instead. To gauge whether this occurred in practice, figure ES.4 plots the effects of the pandemic on the proportion of young people, by gender, who are Not in Education, Employment, or Training (NEETs) in six countries that collected data on both employment and school enrollment. The share of NEETs increased in most countries, even after schools reopened. Although the results of the analysis suggest that the differences in pandemic effects across gender were modest, structural impediments to women’s participation in the labor market are far higher in many countries than they are for men’s participation.

Declines in employment not matched by increases in school enrollment are a grave concern for two reasons. First, time out of the labor force is time spent without acquiring on-the-job experience, and such experience is a key way to build human capital. Second, time spent out of work can lead to *scarring* in the labor market. In the United States, for example, individuals entering the labor market in a typical recession (associated with a 4–5 percentage point rise in unemployment rates) have initial earnings that are 10–15 percent lower than those of similar cohorts entering labor markets in “normal” times. These negative effects may not fade out for a decade.²²

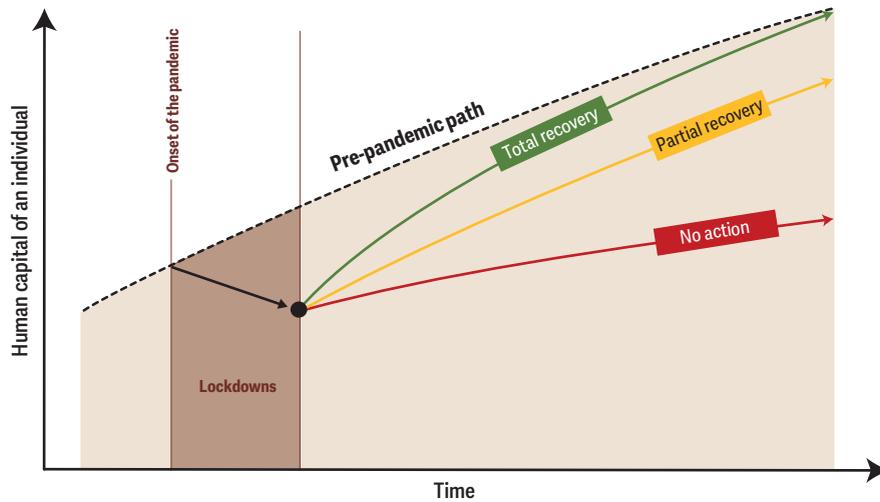
Finally, evidence suggests that beyond the labor market, the pandemic worsened a variety of outcomes for young people in some settings, including higher rates of teenage pregnancy, worse mental health, and declines in the development of key social-emotional skills and executive functions. However, fewer data are available on these outcomes than for schooling and employment.

POLICIES TO REVERSE HUMAN CAPITAL LOSSES

The pandemic eroded human capital at critical ages. Whether this erosion leads to a permanent reduction in future stocks of human capital depends on both the size of the initial drop in the *level* of human capital as well as the *rate* at which human capital accumulates thereafter. This point is illustrated in figure ES.5, which shows three possible paths for an individual.



FIGURE ES.5 What are the paths to recovery?



Source: Original figure for this publication.

Because human capital is built in a sequential, cumulative fashion, in the absence of remediation policies early deficits will increase over time. This is the worst-case scenario in figure ES.5 (red line), which shows an increasing divergence in human capital accumulation relative to the pre-pandemic path.

It is also possible that, after the initial drop, human capital grows along a trend exactly parallel to its pre-pandemic path (yellow line). Two points are important about this scenario. First, because the effect of shocks tends to compound over time, setting out on this recovery path implies substantial investments in human capital over and above those that would have been made in the absence of the pandemic. Second, this scenario only results in a partial recovery of human capital losses. Thus, in this scenario the stock of human capital would still be lower in the future.

Finally, as figure ES.5 illustrates, the only path that does not entail permanent losses in human capital is the one in which human capital grows at a higher rate after the initial shock (green line). Achieving this convergent path is a tall order. It would mean, for example, that children would have to learn more in every grade in school than they were learning before the pandemic. However, this is the only path by which individuals and countries can achieve the levels of human capital they would have had in the absence of the pandemic.

Figure ES.5 clearly indicates the magnitude of the task ahead. It is possible to recover human capital losses, but it will require a substantial sustained effort—including, but not only, additional expenditures. With this framework in mind, this section points out what actions should receive priority at each stage in the life cycle. Some of the most important ones are summarized in table ES.1.

Young children have missed critical investments in health and preschool, and their levels of cognition, vocabulary, and early learning in math and language have in many cases dropped dramatically. To prevent this poor start from amplifying into greater human capital losses as these children progress along the life cycle, policies should prioritize transfers for households whose income has not recovered, catch-up campaigns for vaccination and nutrition, parenting programs to encourage more cognitive and social-emotional stimulation in the home, restored and expanded coverage of pre-primary education, and mental health counseling programs for parents.

School-age children suffered from unprecedented school closures. They learned little if anything while schools were closed, and so their learning losses are massive. In addition, some children may be at risk of dropping out of school altogether, especially in lower-income countries. To reverse learning losses,



TABLE ES.1 There are evidence-proven policies that can reverse human capital losses

	Life cycle phase	Challenge	Policy recommendations
Early childhood		<p><i>For infants and toddlers</i></p> <ul style="list-style-type: none"> Declines in immunizations and possible declines in nutritional status Deficits in cognitive, language, social-emotional, and motor skills <p><i>For children ages 3–5</i></p> <ul style="list-style-type: none"> Deficits in cognitive, early literacy, early numeracy, social-emotional, and motor skills 	<ul style="list-style-type: none"> Support targeted campaigns for vaccinations and nutritional supplementation. Expand coverage of cash transfers for households with young children. Increase coverage of parenting programs. Expand coverage of pre-primary education. Insert social-emotional skills into curricula and plan transitions to primary school.
School-age children		<p>Learning losses—in both low- and middle-income countries</p> <p>School dropouts—primarily in lower-income countries</p>	<ul style="list-style-type: none"> Keep schools open and increase instructional time. Assess learning, match instruction to students' level, launch catch-up campaigns for students who have fallen furthest behind. Focus on foundations and streamline the curriculum. Create a political commitment for learning recovery. Track students at risk of dropping out. Alleviate financial constraints and provide incentives for students to attend school.
Youth		<p>Employment losses among young people</p> <p>Declines in enrollment in upper-secondary school, university, TVET institutions</p> <p>More young people neither studying nor working</p> <p>Teenage pregnancy, impairments in mental health, and worse social-emotional skills in some contexts</p>	<p><i>Policies will vary by country type:</i></p> <ul style="list-style-type: none"> In countries where neither youth nor adult employment has recovered, focus policies primarily on the demand side, encouraging firms to start hiring again. In countries where adult employment has recovered and youth employment has not, emphasize supply-side policies such as adapted training, job intermediation, entrepreneurship programs, and new workforce-oriented initiatives for youth. In countries where both adult and youth employment have recovered, there is no emergency. <p><i>Policies also vary within country by age:</i></p> <ul style="list-style-type: none"> For younger youth (ages 15–18), support conditional cash transfers and information campaigns. For older youth (ages 19–24), make post-secondary education relevant and engaging and partner with service providers and the private sector to offer short-term practical credentials.
Human development systems		<p>Sector-specific pandemic responses unable to protect all dimensions of human capital across the life cycle</p> <p>Existing systems unable to deliver support and services at the scale required during the crisis</p>	<ul style="list-style-type: none"> Invest in data collection and information systems to provide targeted support when required. Leverage technology to deliver services (including developing cross-sectoral beneficiary registries, platforms, and payment systems). Invest in coordination mechanisms (including joint committees with representation from all ministries involved in different aspects of human capital). Invest in flexible payment systems and contractual mechanisms that allow for the rapid reallocation of resources in response to evolving crises (including agile cross-sectoral public finance management systems and contractual relationships with the private sector to meet surges in demand).

Source: Original table for this publication.

Note: TVET = technical and vocational education and training.

decision-makers should keep schools open and increase instructional time, assess learning and match instruction to students' learning level, implement targeted catch-up policies such as tutoring for children who have fallen the furthest behind, and streamline curricula to focus on foundational learning. To minimize dropouts, countries should track students at risk of dropping out, especially in transition years, and alleviate the financial constraints to school attendance.

Youth have suffered from sharp declines in their job prospects, and the extent to which employment has recovered varies a great deal across countries. Appropriate policies will therefore vary by country—in particular, by the extent to which there has been a recovery of both adult and youth employment. For countries where neither adult nor youth employment has recovered, policies should primarily be geared toward demand-side interventions that spur firms to start hiring again. For countries where adult employment has recovered but youth employment has not, support for supply-side policies such as adapted training, job intermediation, entrepreneurship programs, and new workforce-oriented initiatives for youth are all important. Countries where both adult and youth employment have recovered should monitor developments in the labor market to ensure that the recovery has been equal across groups. In all countries, policies should recognize that youth are a diverse group and that skills are the best insurance against a crisis.

BUILDING AGILE, RESILIENT, AND ADAPTIVE HUMAN DEVELOPMENT SYSTEMS FOR FUTURE SHOCKS

The COVID-19 pandemic has arguably been the largest global shock to human capital in the past century. Moreover, countries will continue to face shocks in the future—health and climate emergencies, natural disasters, and macroeconomic crises—that, like the pandemic, can erode human capital across the life cycle. In addition to impeding human capital accumulation at each stage of the life cycle, the pandemic has revealed systemic weaknesses in how governments integrate efforts across sectors to address the multidimensional nature of human capital deficits. In some cases, interventions in health will be most appropriate to address specific losses in human capital; in others, it may be that education or social protection policies are most effective. But in most cases, countries need solutions that bring these sectors together into a holistic human development system. Evidence suggests that during the COVID-19 crisis, very few countries responded with integrated approaches, and most countries lacked the capacity to collect and link data from programs in different sectors.

Such a human development system should build on existing sector-specific systems and individual programs to take a broader look at how investments in human capital could be coordinated and how complementarities could be exploited. In a crisis, human development systems can help policy makers resolve trade-offs across many competing needs in a constrained fiscal environment. To be effective, such systems should have three key characteristics:

1. They should be agile, resilient, and adaptive and able to expand and contract quickly during crises to reach vulnerable groups.
2. They should have a mandate and authority to coordinate across sectors, identify interventions that are complementary, and resolve trade-offs.
3. They should be data-driven, effectively use technology, and identify problems and “pain points” as a crisis unfolds.

To build these systems, countries need to invest in data collection and information systems to provide targeted support when required. They also need to leverage technology to deliver services (including cross-sectoral beneficiary registries, platforms, and payment systems) and to invest in coordination mechanisms (including joint committees with representation from all ministries involved in aspects of human capital). Finally, countries should invest in flexible payment systems and contractual mechanisms that allow for the rapid reallocation of resources in response to an evolving crisis.

During the pandemic, most countries were able to expand existing programs in all sectors, but especially in health and social protection. For example, Argentina relied on expansions of Programa Sumar to ensure access to health care for the unemployed. Social protection programs grew rapidly during the pandemic, reaching nearly 1.4 billion people (17 percent of the world's population) over 2020–21. Notably, countries that had made earlier investments in technology, such as in interoperable beneficiary identification and payment systems, were able to expand social assistance coverage faster.

Some countries were also able to retool, redirect, or reactivate programs built in response to earlier shocks. Sierra Leone adapted the social safety net systems set up to respond to Ebola, flooding, and landslides for use in rolling out cash transfers and providing additional types of support during the pandemic. Some countries were able to engage service providers beyond the traditional public sector to deliver services. For example, in 2020 and 2021 the Indian state of Kerala contracted with more than 300 private hospitals so it could add them to the publicly funded insurance scheme for the poor and vulnerable to help sustain service delivery during the pandemic. This expansion—effectively more than doubling the number of private hospitals in the scheme—built on years of previous engagement of the private sector by the state government. Uruguay was able to move from in-person instruction to remote learning during the pandemic thanks to Plan Ceibal, a functional remote-learning program launched in 2007 that has helped ensure access to free laptops for students and teachers, has provided them with internet connections, and, critically, has trained teachers in remote instruction over the last decade.

By contrast, truly cross-sectoral approaches were rare. By and large, countries failed to assess the costs and benefits of specific sectoral policies *jointly*. The timing and length of lockdowns and mobility restrictions generally did not take into account the coverage of social protection, which made it difficult for households to comply with the restrictions. Keeping schools closed for as long as many countries did, even after restrictions on the use of public transportation had been lifted, and markets, stores, movie theaters, and restaurants had opened, reflected a failure to balance competing risks—the risk of infection in schools (low) relative to the risk of learning losses (high)—and to update policy choices as new information became available.

A HUMAN CAPITAL RECOVERY: WHAT WILL IT TAKE?

Table ES.1 lists, for each phase of the life cycle, policy recommendations for recovering from pandemic-induced human capital losses and building resilience for the next shock. The list is long, particularly in the context of competing crises and tight fiscal space.

Which policies should countries put at the top of their human capital recovery list? First, an emphasis on transition periods in the life cycle—from early childhood to school age, from one level of education to another, from school to work, and from youth to adulthood—can help stem the accumulation of losses. Transitions are defining moments: what happens during these stages may generate deficits that interfere with the entire trajectory of human capital accumulation in subsequent stages of the life cycle.

Second, the report also provides evidence on the full cost of each proposed policy. This full cost includes fiscal costs, as well as costs stemming from implementation complexity and political commitment required. It highlights that many of the proposed policies do not require important fiscal efforts. Rather, they require institutional capacity building and political will.

Recovery is possible, and many countries have already made progress in recovering losses in human capital that arose from the pandemic. In Pakistan, for example, more than 1.2 million children missed immunizations during the first year of the pandemic, but intensive outreach efforts, in part enabled by an electronic immunization registry, contributed to successful catch-up efforts that had immunized 76 percent of these children by March 2021.²³ In Tamil Nadu, India, school-age children exhibited severe deficits in reading and math when they returned to in-person learning after pandemic-induced school closures. After six months, two-thirds of the losses had been recovered, with 24 percent of the recovery attributable to government-run after-school catch-up programs.²⁴

The pandemic may have led to a clear-cut collapse in human capital, but what is needed to get on a path of recovery is equally clear. Transforming the collapse into a recovery should begin now.

NOTES

1. Msemburi et al. (2022).
2. World Bank (2022).
3. Heckman (2006).
4. World Bank (2022).
5. Original calculations for this publication. The International Labour Organization (ILO) defines prime-age adults as those between the ages of 25 and 55.
6. Fox, Levitt, and Nelson (2010); Johnson (2001); Mukherjee (2016).
7. Spelke and Schutts (2022).
8. Egger et al. (2021); Miguel and Mobarak (2021).
9. WHO and UNICEF (2021).
10. Hillis et al. (2022).
11. Bau et al. (2022); Bullinger et al. (2021); Moya et al. (2021).
12. Bailey, Sun, and Timpe (2021).
13. For Bangladesh, Hamadani et al. (forthcoming); for Brazil, Maria Cecilia Souto Vidigal Foundation (2021).
14. Gertler et al. (2021); Grantham-McGregor et al. (1991).
15. These estimates include school-age children from pre-primary to upper-secondary education (ages 5–17) from 140 countries with a school-age population of 500,000 or more. For simplicity, it is assumed that one school year is equal to 32 academic weeks across all countries. World Bank estimations are based on data from the United Nations Educational, Scientific, and Cultural Organization (UNESCO) Institute for Statistics (UIS).
16. UNICEF and ITU (2020).
17. UNICEF, UNDP, and SMERU (2021).
18. Biswas et al. (2020).
19. This estimate is derived from a simple linear regression of learning losses on school closures with no constant.
20. This relationship is robust to a number of specifications, such as including all countries, excluding high-income countries, limiting the sample to the highest-quality studies, or excluding data points that disproportionately influence the regression results. Resulting coefficients are all significant and in the range of -0.28 to -0.42 .
21. The chapter uses the terms *youth* and *young people* interchangeably.
22. Von Wachter (2020).
23. Chandir et al. (2021).
24. Singh, Romero, and Muralidharan (2022).

REFERENCES

- Bailey, M. J., S. Sun, and B. Timpe. 2021. "Prep School for Poor Kids: The Long-Run Impacts of Head Start on Human Capital and Economic Self-Sufficiency." *American Economic Review* 111 (12): 3963–4001.
- Bau, N., G. Khanna, C. Low, M. Shah, S. Sharmin, and A. Voena. 2022. "Women's Well-Being during a Pandemic and Its Containment." *Journal of Development Economics* 156: 102839.
- Biswas, K., T. M. Asaduzzaman, D. K. Evans, S. Fehrler, D. Ramachandran, and S. Sabarwal. 2020. "TV-Based Learning in Bangladesh." World Bank, Washington, DC.
- Bullinger, L. R., A. Boy, S. Messner, and S. Self-Brown. 2021. "Pediatric Emergency Department Visits Due to Child Abuse and Neglect following COVID-19 Public Health Emergency Declaration in the Southeastern United States." *BMC Pediatrics* 21 (401): 1–9.
- Chandir, S., D. A. Siddiqi, M. Mehmood, S. Iftikhar, M. Siddique, S. Jai, V. K. Dharma, et al. 2021. "1-Year Impact of COVID-19 on Childhood Immunizations in Pakistan: Analysis of >3.7 Million Children." *European Journal of Public Health* 31 (Suppl. 3): ckab164.538.

- Egger, D., E. Miguel, S. S. Warren, A. Shenoy, E. Collins, D. Karlan, D. Parkerson, et al. 2021. "Falling Living Standards during the COVID-19 Crisis: Quantitative Evidence from Nine Developing Countries." *Science Advances* 7 (6): eabe0997.
- Fox, S. E., P. Levitt, and C. A. Nelson, III. 2010. "How the Timing and Quality of Early Experiences Influence the Development of Brain Architecture." *Child Development* 81 (1): 28–40.
- Gertler, P., J. J. Heckman, R. Pinto, S. M. Chang, S. Grantham-McGregor, C. Vermeersch, S. Walker, et al. 2021. "Effect of the Jamaica Early Childhood Stimulation Intervention on Labor Market Outcomes at Age 31." NBER Working Paper 29292, National Bureau of Economic Research, Cambridge, MA.
- Grantham-McGregor, S. M., C. A. Powell, S. P. Walker, and J. H. Himes. 1991. "Nutritional Supplementation, Psychosocial Stimulation, and Mental Development of Stunted Children: The Jamaican Study." *The Lancet* 338 (8758): 1–5.
- Hamadani, J., M. Imrul, S. Grantham-McGregor, S. Alam, M. Tipu, D. Parra Alvarez, S. Shiraji, et al. Forthcoming. "The Effect of the COVID-19 Pandemic on Children's Development and Nutritional Status at Age 20 Months in Rural Bangladesh."
- Heckman, J. J. 2006. "Skill Formation and the Economics of Investing in Disadvantaged Children." *Science* 312 (5782): 1900–02.
- Hillis, S., J. P. N. N'konzi, W. Msemburi, L. Cluver, A. Villaveces, S. Flaxman, and H. J. T. Unwin. 2022. "Orphanhood and Caregiver Loss among Children Based on New Global Excess COVID-19 Death Estimates." *JAMA Pediatrics* 176 (11): 1145–48.
- Johnson, M. H. 2001. "Functional Brain Development in Humans." *Nature Reviews Neuroscience* 2 (7): 475–83.
- Maria Cecilia Souto Vidigal Foundation. 2021. "Learning in Early Childhood Education and the Pandemic: A Study in Sobral/CE." <https://www.fmcsv.org.br/en-US/biblioteca/impacto-aprendizadem-covid-sobral/>.
- Miguel, E., and A. M. Mobarak. 2021. "The Economics of the COVID-19 Pandemic in Poor Countries." NBER Working Paper 29339, National Bureau of Economic Research, Cambridge, MA.
- Moya, A., P. Serneels, A. Desrosiers, V. Reyes, M. J. Torres, and A. Lieberman. 2021. "The COVID-19 Pandemic and Maternal Mental Health in a Fragile and Conflict-Affected Setting in Tumaco, Colombia: A Cohort Study." *The Lancet Global Health* 9 (8): e1068–e1076.
- Msemburi, W., A. Karlinsky, V. Knutson, S. Aleshin-Ghendel, S. Chatterji, and J. Wakefield. 2022. "The WHO Estimates of Excess Mortality Associated with the COVID-19 Pandemic." *Nature* 613: 130–37.
- Mukherjee, S. 2016. *The Gene: An Intimate History*. New York: Scribner.
- Singh, A., M. Romero, and K. Muralidharan. 2022. "COVID-19 Learning Loss and Recovery: Panel Data Evidence from India." NBER Working Paper 30552, National Bureau of Economic Research, Cambridge, MA.
- Spelke, E., and K. Schutts. 2022. "Learning in the Early Years." In *Quality Early Learning: Nurturing Children's Potential*, edited by M. Bendini and A. E. Devercelli. Washington, DC: World Bank.
- UNICEF (United Nations Children's Fund) and ITU (International Telecommunication Union). 2020. "How Many Children and Young People Have Internet Access at Home? Estimating Digital Connectivity during the COVID-19 Pandemic." New York: UNICEF and ITU.
- UNICEF (United Nations Children's Fund), UNDP (United Nations Development Programme), Prospera, and SMERU (SMERU Research Institute). 2021. "Analysis of the Social and Economic Impacts of COVID-19 on Households and Strategic Policy Recommendations for Indonesia." Jakarta.
- Von Wachter, T. 2020. "The Persistent Effects of Initial Labor Market Conditions for Young Adults and Their Sources." *Journal of Economic Perspectives* 34 (4): 168–94.
- WHO (World Health Organization) and UNICEF (United Nations Children's Fund). 2021. "Progress and Challenges with Sustaining and Advancing Immunization Coverage during the COVID-19 Pandemic: 2021 WHO/UNICEF Estimates of National Immunization Coverage (WUENIC)." WHO and UNICEF, Geneva and New York.
- World Bank. 2022. *Poverty and Shared Prosperity 2022: Correcting Course*. Washington, DC: World Bank.

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Worldwide, the COVID-19 pandemic has been an enormous shock to mortality, economies, and daily life. But what has received insufficient attention is the impact of the pandemic on the accumulation of human capital—the health, education, and skills—of young people. How large was the setback, and how far are we still from a recovery? *Collapse and Recovery* estimates the impacts of the pandemic on the human capital of young children, school-age children, and youth and discusses the urgent actions needed to reverse the damage. It shows that there was a collapse of human capital and that, unless that collapse is remedied, it is a time bomb for countries. Specifically, the report documents alarming declines in cognitive and social-emotional development among young children, which could translate into a 25 percent reduction in their earnings as adults. It finds that 1 billion children in low- and middle-income countries missed at least one year of in-person schooling. And despite enormous efforts in remote learning, children did not learn during the unprecedentedly long school closures, which could reduce future lifetime earnings around the world by US\$21 trillion. The report quantifies the dramatic drops in employment and skills among youth that resulted from the pandemic as well as the substantial increase in the number of youth neither employed nor enrolled in education or training. In all of these age groups, the impacts of the pandemic were consistently worse for children from poorer backgrounds. These losses call for immediate action.

The good news is that evidence-based policies can recover these losses. *Collapse and Recovery* reviews governments' responses to the pandemic, assessing why there was a collapse in human capital accumulation, what was missing in the policy architecture to protect human capital during the crisis, and how governments can better prepare to withstand future shocks. It offers concrete policy recommendations to recover losses in human capital—programs that will end up paying for themselves in the long term. To better prepare for future shocks such as climate change and wars, the report emphasizes the need for solutions that bring health, education, and social protection programs together in an integrated human development system. If countries fail to act, the losses in human capital documented in this report will become permanent and last for multiple generations. The time to act is now.

