Estimate on lost days of education – accompanying note

The impact of COVID-19 on education

We are facing an education emergency. For the first time in human history, an entire global generation has had their education disrupted: at the height of the COVID-19 pandemic, over 1.6 billion learners were out of school. And we know from previous crises that the longer children are out of school, the greater the risk that they don't return.

Methodology

Our analysis estimates the **total lost days of school worldwide** since the onset of the COVID-19 pandemic and the number of **lost school days per child**. To do this, we used existing data on school closures, lack of access to remote learning, out of school rates, and school-aged population (Table 1). When possible, we disaggregated data by level of education, namely primary, lower secondary, and upper secondary school.

Data on **school closures** comes mainly from UNESCO. We integrated the UNESCO dataset with data by the Centre for Global Development's COVID education policy tracker for school closures in Macao, Hong Kong, Puerto Rico, and Kosovo. When data by CGD was used, we estimated the actual number of days when school were closed between the closing and opening day provided in the dataset by using open-source information on academic calendars. For instance, the tracker reported that schools in Kosovo closed on 11 March 2020 and re-opened on 14 September 2020. However, not all days in between qualified as lost school days, as Kosovo's academic calendar schedules a long summer break from early June to mid-September.

Data on **lack of access to remote learning** is based on UNICEF research. Because it covers low- and middle-income countries only, we integrated it with data on internet access (which we took as a proxy for access to remote learning) in households with children under the age of 18 from Eurostat (2019) for EU countries and from the US Census Bureau (2019) for the US. We applied US rates of internet access to North America as a whole.

Data on **school-aged population** was drawn from UNESCO's Institute of Statistics and it is disaggregated by level of education. In the absence of information, data was imputed based on population estimates from the World Bank. For convenience, we assumed that primary school population (UNESCO) corresponded to population in the age brackets of 5-9 years. We repeated the same procedure for lower secondary school (age bracket 10-14 years) and upper secondary school (age bracket 15-19 years). This yields a total of 1.5 billion learners in primary and secondary school for 194 countries.

Indicator	Source	Coverage	Level of analysis	Time period
School closures	UNESCO; Centre for Global Development	Global	National level, disaggregation by level of education	16 February 2020 to 2 February 2021
Out of school rates	UNESCO Institute of Statistics	Global	National level, disaggregation by level of education	Latest available value
Lack of access to remote learning	UNICEF; Eurostat; US Census Bureau	Low- and middle-income countries; EU North America	Regional level, disaggregation unavailable	2020 2019 2019

School-aged population	UNESCO Institute of Statistics; World Bank	Global	National level, disaggregation by level of education	2020

We consider a lost day of school a day in which *a student, who would otherwise have attended school, was forced to stay home due to school closures and did not have access to remote learning*. This is reflected in the formula below. For each country, the formula was applied three times, one per level of education.

Lost days of school x (100% - out of school rate) x school-aged population x lack of access to remote learning

For example, if a school with 10 pupils remains closed for 10 days and only 50% of the students can access remote learning from home, this means a total of 50 lost days of school (10x10x0.5) or 5 days per child (50/10).

This formula is an underrepresentation of the true effect as it assumes that remote learning equals in-person learning. While research on the effectiveness of remote learning is inconclusive, especially on a global scale, past and emerging evidence shows that remote learning is inferior to in-person learning, both in terms of quality and quantity – especially for already disadvantaged children. For instance, a November 2020 study by the British Institute for Fiscal Studies comparing UK students' time use before and during the pandemic shows a steep decline not only in the maximum percentage of students engaged in remote learning at any given hour (from 90 to 60%), but also in the number of hours spent on learning daily (-33% for primary school children and -37% for secondary school children). So, we included an online penalty in the model accounting for these setbacks.

Lack of data in high-income countries is exacerbated in lower income contexts. However, due to systemic problems, such as the quality of infrastructure, it is plausible to think that whichever challenges children face in high-income countries, children in lower-income countries will face greater ones on average. So, we estimate the online penalty on a global level to be around 50%, meaning that on average a day spent practicing online learning is equal to half a day spent in school.

So, the formula is updated as follows:

Lost days of school x (100% - out of school rate) x school-aged population x [lack of access to remote learning + (1 - lack of access to remote learning) x online penalty]

So, if a school with 10 pupils remains closed for 10 days and only 50% of the students can access remote learning from home, this means a total of 75 (10x10x0.5 + 10x10x0.5x0.5 = 50 + 25) lost days of school, or 7.5 days per child (75/10).

To calculate the final number, we sum the lost days of school for each country and level of education, for a total of **112 billion lost days of school, or a staggering 74 per child** on average (Table 2).

Region	Total lost days (billion)	Lost days per child
Sub-Saharan Africa	21	69
South Asia	46	109
East Asia and Pacific	19	47
Latin America and the Caribbean	13.6	110
Middle East and North Africa	7.1	80
Europe and Central Asia	5.6	45
North America	0.2	4
Total	**112**	**74**

A likely underestimate

As huge as the figure 112 billion may appear, it is actually a remote best-case scenario. Indeed, 74 school days lost per child is most likely an underestimate. This is due to both the data sources and the assumptions we use in our model. In particular:

- Data on school closures worldwide is collected by UNESCO, the Centre for Global Development, and the World Bank. An important difference between them is that the UNESCO dataset is the only one where the status of school closures in a country is reported day by day – which is why we selected it for our model. A second difference between UNESCO and World Bank data is that they don't completely align on the status of school closures for selected dates in selected countries. Specifically, when UNESCO reports that schools in a country are fully or partially open on a certain day, the World Bank reports that they are closed (e.g., Indonesia, Egypt, Thailand). This means that using World Bank data in the model would have yielded a higher number of lost school days, while UNESCO data yields a lower one.

- The UNESCO dataset groups schools in any given country into four categories: 1. on an academic break (so a day when schools are closed, but no school day is lost), 2. fully open, 3. fully closed due to COVID-19, and 4. partially open (meaning that some schools are open are some are not). While data is available on the number of children affected when schools are fully closed, this is not the case when schools are classified as partially closed. In the absence of a figure on the extend of the closure (e.g., X% of schools, or Y% of children at home), we decided to treat partially open schools as fully open. If we decided to factor in partial school closures (for instance by assuming that the school system is operating at a 50% capacity on those days), the number of lost school days would be much higher.

- In high-income countries in Europe and North America, our model equates access to the internet to access to remote learning. This is also an optimistic assumption. For instance, a household with more than 1 dependant under 18 might have internet access but lack devices to guarantee remote learning for each dependant. Recent research by UNICEF's Innocenti Research Centre finds that in Italy, over 1 in 4 (27%) families reports not having enough devices to support remote schooling needs. So, while Eurostat data shows that access to internet in households with school-age children is almost universal, access to remote learning isn't. Factoring in barriers to remote learning to a greater extent would once more increase the final number of our estimate.

- UNICEF numbers on lack of access to remote learning might also represent an underestimate. First, UNICEF figures indicate the "minimum proportion" of schoolchildren unable to access remote learning, implying that many more could fall into that category. In addition, UNESCO offers figures on lack of access to remote learning at the regional level, with regional estimates necessarily hiding a high variance between countries. For instance, UNICEF estimates that 1 in 2 children (48-49%) cannot access remote learning in sub-Saharan Africa. World Bank high-frequency phone-surveys on the impact of COVID-19 find that access to remote learning varies widely by country, ranging from around 20% in Rwanda and Kenya up to over 70% in Ethiopia, Mali, or Malawi.[1]

[1] Save the Children analysis based on World Bank data. Available in GRID, Save the Children's Child Inequality Tracker.