Nearly all schools closed at some point during the Covid-19 pandemic. Reviewing the international evidence to date on the impact of these closures, **Jo Blanden**, **Matthias Doepke** and **Jan Stuhler** warn that they will substantially increase educational inequality.

The impact of school closures on educational inequality

School and university closures in the spring of 2020 affected 94% of the world's students, according to the United Nations Educational, Scientific and Cultural Organisation (Unesco). The closures varied widely in length, and were only partially determined by Covid-19 infection rates (OECD, 2021). Students in many developing countries, and in some US states, experienced closures lasting more than a year, whereas there were no designated school closures at all in Belarus and Burundi.

We have investigated whether school closures increase educational inequality, where educational inequality is defined as achievement gaps between children who come from more and less advantaged family backgrounds. There are two reasons why those from poorer backgrounds might suffer more from school closures than other children: first, the incidence of school closures themselves may vary by social background; and second, children from disadvantaged backgrounds might experience greater learning losses if their school closes.

Children's learning depends on inputs from parents and educational institutions, as well as from neighbourhood and peer effects – where and with whom they grow up. The potential for other inputs to compensate when schools are closed is likely to differ across families.

During the closures, the inputs provided by schools and teachers were often delivered via online education. Yet just how well virtual education can replace in-person schooling depends on factors such as having a reliable internet connection, functioning tablets or laptops, and a quiet work environment, all of which are more likely to be available in higher-income families.

Parents also play an important role. Richer ones may not only be more capable of assisting their children in making up for lost time, but they are also more likely to work from home and be available to help if need be.

School closures are not the only mechanism through which the pandemic may affect educational inequality. Its macroeconomic effects could decrease parents' income and educational investments, reduce public spending on schooling and/or affect the returns and incentives to acquiring education.

The full impact of all of these changes on educational inequality will gradually emerge over the next few years, but researchers are already offering predictions based on several sources; from pre-pandemic evidence on the consequences of school closures; from early evidence from the pandemic; and from structural analysis of its long-run impact.

School closures were more common in low-income neighbourhoods

Parolin and Lee (2021) show that US school closures in the autumn of 2020 were more common for students from ethnic minorities. School closures were also more widespread in institutions with lower mathematics scores for children in the third grade (eight to nine-year-olds), more homeless students, more students with limited English proficiency, and a larger share of students eligible for free or subsidised lunch. Halloran et al (2021) confirm this picture, documenting that school districts with a greater share of black students and a higher share of students receiving free lunches offered less in-person schooling.

In the UK, school closures are determined at the national level, but local mitigation procedures led to varying incidence, as groups of children were required to isolate if a positive case was detected in their "bubble". Eyles and Elliot Major (2021) show that in the autumn of 2020, these localised measures led to nine days of missed schooling in the poorest areas compared with only two days in the most affluent areas. This evidence suggests that variation in the incidence of school closures could exacerbate educational inequalities.

Remote learning helped, but was less effective than classroom instruction

Some alarming direct evidence is emerging on how school closures in the early phases of the pandemic affected learning. Engzell et al (2021) find that in the Netherlands, pupils learned nothing, on average, over a period of eight weeks of online education. The impact is 40% larger among those in less educated homes, suggesting that the pandemic not only increased educational inequality, but that disadvantaged children's skills actually deteriorated.

Tomasik et al (2021) analyse improvement in student skills in German-speaking Switzerland over the initial eight-week school closure starting in March 2020, compared to the eight weeks just prior. On average, primary school pupils learned half as much under distance learning, and there was more inequality in their progression. In particular, those with higher ability going into the pandemic saw stronger effects. Students in secondary school learned at the same speed as before.

These results suggest that school closures during the pandemic had greater effects on test scores than one might have expected based on extrapolations from prior evidence from other learning disruptions such as holidays and strikes. Children's learning may have been affected not just by the closures themselves but also by other effects of the crisis, such as the

Early years in education provide a crucial foundation, but younger children have more opportunities to catch up

disruption of interactions with peer groups or increased anxiety during the pandemic. Improved virtual instruction might have helped to reduce learning losses as the pandemic wore on, but uneven engagement has the potential to worsen inequalities even further.

Andrew et al (2020) survey parents in the first period of school closures in England and find that primary school students in the tenth percentile of the family income distribution did about 35 minutes less learning per day than those from median-income families, and 1 hour and 10 minutes less that a child from a family in the 90th percentile of the income distribution. Similarly, Grewenig et al (2021) and Werner and Woessmann (2021) find that during school closures, low-achieving students in Germany disproportionately replace learning time with less obviously productive activities, such as playing video games.

School closures during the pandemic could have affected learning through three channels:

- First, there could be a decline in the overall efficiency of skill accumulation because remote learning is less effective than in-person instruction.
- Second, parents have to replace some inputs that are usually provided by teachers. Parents' ability to provide these inputs depends on time constraints: parents who are able to work from home during the pandemic would have had an easier time helping their children with school work than do essential workers who had to work outside the home.
- Third, peer effects and peer-group formation are also disrupted during the pandemic, meaning that children from lower income backgrounds would have had less opportunity to mix with those from more advantaged backgrounds.

Existing inequalities were exacerbated by the pandemic

Agostinelli et al (2022) assess the contribution of the three channels to educational inequality. All are found to contribute to a widening of educational inequality. While all parents increase their time investments during the pandemic, the ability of low-income parents to respond is hampered by the fact that they are much less likely to have jobs that can be done from home. Hence, inequality in parental inputs increases between high- and low-income neighbourhoods.

Inequality in peer effects also rises, in part because children from low-income neighbourhoods lose the ability to meet more high-ability peers at school, and in part because the effect of losing any peer connection on learning is worse for children already struggling in school.

In the United States, secondary and public schools were closed for longer periods than elementary and private schools, respectively. Fuchs-Schündeln et al (2021) predict that the earnings losses will be largest for children who started public secondary schools at the onset of the crisis. Negative effects are smaller for children from richer families, who are more likely to send their children to private school.

Survey evidence shows that considerably fewer children continued learning activities during school closures in low-income countries, with particularly large reductions in sub-Saharan Africa. Limited education funding and less access to communications technology implies that few children had access to virtual lessons during school closures. Many children essentially received no education at all during prolonged school closures, meaning the total learning losses are likely to be severe.

Moreover, learning losses are likely to have a greater long-run economic impact in low-income countries. This is partly for demographic reasons. Low-income countries have much younger populations than high-income countries, which means that cohorts of children finishing school are large compared with the adult labour force.

Learning is a cumulative process, with skills acquired at one life stage fostering learning later on. This means that learning losses, once incurred, are difficult to compensate for later. Many of the children affected by the pandemic are therefore likely to enter adult life with fewer skills and lower educational attainment than they otherwise would have. This loss of what economists call human capital will be reflected in lower lifetime earnings at the individual level, and could result in a lower

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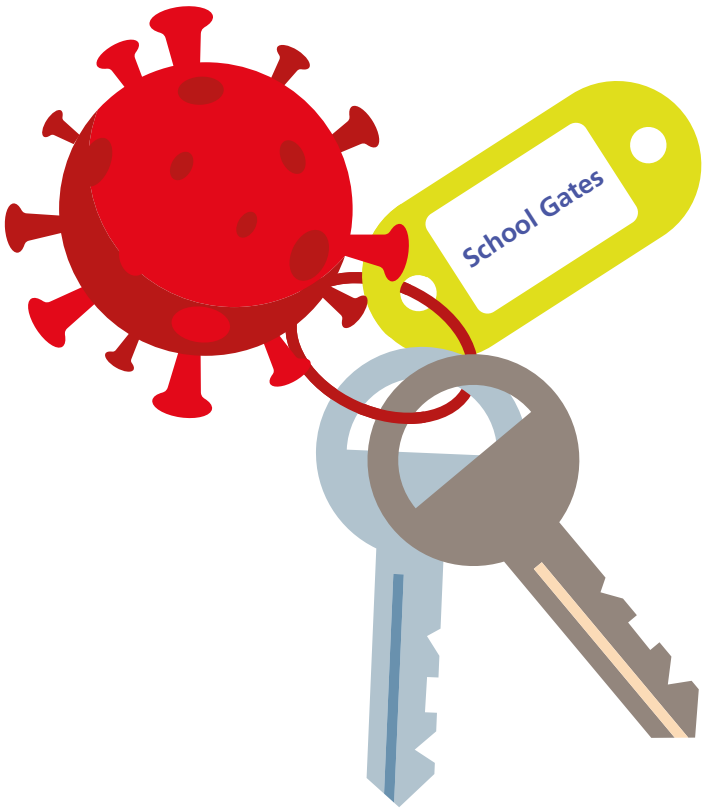

stock of human capital and lower national income at the aggregate level for decades.

Commentators have called for policy action to help to offset the damaging effects of school closures. For example, in Fuchs-Schündeln et al (2021) the authors suggest a policy intervention to extend schooling (by shortening the summer breaks in future years) would raise tax contributions sufficiently to be self-financing. Others have suggested policies including increased school funding and small group tutoring.

All of these have potential, with targeted small group instruction shown to be especially fruitful (Nickow et al, 2020). Evidence suggests that additional days spent at school raise test scores for poorer students, but the likelihood of diminishing returns means the optimal length of the post-pandemic school year is unclear.

It has already become clear that the pandemic has had a major negative impact on many children's learning and is likely to have increased educational inequality substantially within the affected cohorts, although there is some dispute in the research about which age group will be most affected. Early years in education provide a crucial foundation, but younger children have more opportunities to catch up, especially if parents react to the crisis by investing in them more. Tracing the effect of this shock over the following years and contributing to the design of effective policy responses represents an important challenge for future research.

This article summarises 'Education Inequality', by Jo Blanden, Matthias Doepke and Jan Stuhler, CEP Discussion Paper No. 1849 (https://cep.lse.ac.uk/_NEW/publications/abstract.asp?index=9246).

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Further reading

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