

Educational inequalities in Europe and physical school closures during Covid-19*

Headlines

- During physical school closures, home resources and parental involvement in school work are of great importance for learning success. However, these benefits are not available equally to all children.
- In half of the 21 European countries examined, 4th grade pupils from lower socio-economic backgrounds are at best half as likely to have access to the internet as their more advantaged peers.
- They are also more likely to lack reading opportunities and a quiet room in most European countries. In addition, parental support during school closure may differ by socio-economic background.
- On average, children who lack resources and support were already lower performers before the crisis. They are likely to have lost further ground during the Covid-19 school closures. This will increase overall European educational inequalities.

Educational inequalities, socio-economic background and Covid-19

Children have the lowest risk of falling victim to the Covid-19 virus, according to the current state of knowledge. However, they have suffered as a result of the physical school closures implemented in response to the pandemic. Around 58 million primary and secondary school children were deprived of usual face-to-face learning with education pro-

fessionals in European countries for several weeks starting in March 2020. Future education data will show how school closures impacted pupils. However, exploiting rich pre-Covid-19 data, it is already possible to provide some initial considerations on current developments in educational inequalities. In the literature, the latter are often defined as differences in educational outcomes by socio-economic background. Here, socio-economic background is defined by parental education, differentiating between children with higher educated parents (where at least one parent has completed higher education) and children with lower educated parents (neither parent completed higher education). In the following, children with higher educated parents are referred to as advantaged and children with lower educated parents as disadvantaged.

Literature on educational inequalities widely acknowledges that differences in home environments and parental support are important for explaining disadvantaged children's lower school performance. This policy brief provides first an early estimate of the likely increase in educational inequalities during the Covid-19 physical school closures in Europe. Second, it discusses evidence on children's access to resources that are key factors known to drive educational inequalities in general and expected to do so particularly strongly at the time of physical school closures. The analyses concentrate on children in their fourth year of formal schooling, typically aged between 9 and 10, referred to throughout as 4th grade pupils. Young children are most vulnerable, since they depend more on parental support and might be less likely to adapt if they lack home resources than older children.

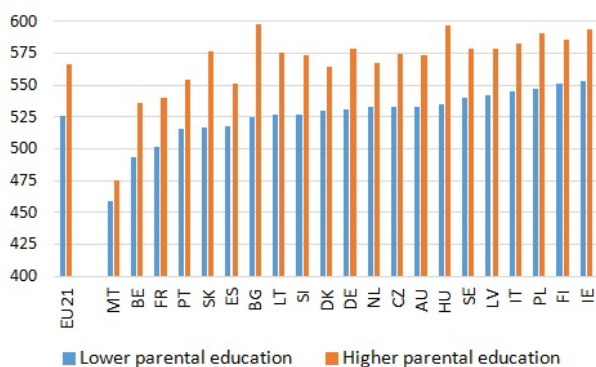
*This policy brief has been prepared by Zsuzsa Blaskó and Sylke V. Schnepf. It builds on the JRC report 'Educational inequalities and physical school closures during Covid-19' (forthcoming).

This brief can be downloaded from <https://ec.europa.eu/jrc/en/research/crosscutting-activities/fairness>.

Substantial pre-Covid-19 educational inequalities among 4th graders

Figure 1 shows differences in educational achievement between 4th graders with higher and lower educated parents, using data from the 2016 Progress in International Reading Literacy Study (PIRLS) for 21 European countries taking part in the survey.

Figure 1. Average PIRLS 2016 reading achievement of 4th graders, by parental education and country



Source: 2016 PIRLS data, authors' calculations.

Note: Lower parental education refers to children for whom neither parent completed tertiary education. Children with higher parental education have at least one parent who completed tertiary education.

The PIRLS reading achievement scale has a centrepiece of 500 points. In Bulgaria, Hungary and Slovakia the parental education gap amounts to 60 points or more, indicating that the achievement level of disadvantaged children is more than 10% lower than their advantaged peers in these countries. Educational disadvantages are smallest in Estonia, Denmark, Finland, the Netherlands and Malta. Research generally agrees that these educational inequalities are driven mainly by unequal opportunities.

Instruction time and predictions of post-Covid-19 educational inequalities

Existing literature shows that longer summer breaks can increase educational inequalities considerably. This is in line with the more general finding that the shorter the instruction time in school, the bigger the resulting socio-economic inequalities in educational achievement.

Assuming that pandemic-induced physical school closures increase educational inequalities similarly to a reduction in instruction times during schooling, by how much can we expect existing inequalities to increase?

To answer this question, the underlying study employs a simple multivariate analysis, which estimates

the association of school instruction time, parental education and their interaction with achievement outcomes on average for all 21 European countries taken together. Results are in line with the literature: on average disadvantaged children benefit more from an increase in instruction time than advantaged pupils. We then compare the actual pre-Covid achievement gap between children with higher and lower educated parents with the achievement gap arising if school instruction time is reduced by 8 weeks (which reflects the average time of school closure due to Covid-19 in the 21 European countries examined). Results indicate an expected increase in the achievement gap of 2.6 PIRLS points. This is a tiny figure compared with an average achievement score of more than 500 points. However, expressed as a percentage of the existing achievement gap it represents a non-negligible 5% increase in educational inequalities associated with physical school closures resulting from Covid-19.

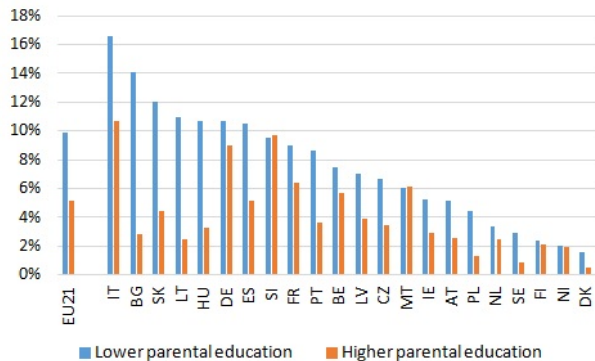
Clearly, this estimation needs to be interpreted as a preliminary forecast of the possible extent of the increase in educational inequalities, given that it is based on pre-Covid-19 data. (See a discussion of further limitations of this prediction in the Quick Guide.) Furthermore, it can be assumed that the forecast underestimates the increase in inequalities. Physical school closure means more learning at home and the success of this is likely to depend on family resources, which differ by socio-economic background.

The unequal distribution of home resources among 4th graders

The most obvious requirement during periods of distance learning is internet access. PIRLS data show that across all European countries covered, 9% of 4th graders did not have internet access in 2016. We can assume that 4 years later access to the internet will have considerably improved, but it is not clear whether inequality in internet access has decreased at the same time. As Figure 2 shows, the proportion of students missing out varies widely between and within countries. Disadvantaged students in Bulgaria, Lithuania, Slovakia, Hungary, Italy, Spain and Portugal are between 5 and 11 percentage points less likely to have access to the internet than their advantaged peers. In some countries their risk of not having internet access is more than three times that of advantaged pupils. According to our estimates, the absence of a computer or tablet at home seems to be somewhat less of a problem (not shown), but

of course having at least one device in the home does not necessarily mean that it can be used for children's homeschooling needs.

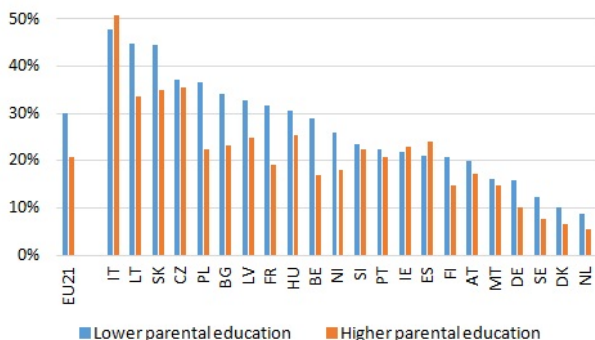
Figure 2. Percentage of 4th graders without internet access at home, by parental education and country in 2016



Source and note: see Figure 1.

Not having a quiet place to study during lockdown, when all or most of the family is at home, is likely to hamper learning further. Figure 3 therefore depicts the percentage of 4th graders who do not have a room of their own. Overall, 25% of young children in the 21 European countries miss out on a quiet learning environment, ranging from 9% in Denmark to 49% in Italy (not shown). In the majority of countries children with lower educated parents are less likely to have their own room, with Italy, Czechia, Slovenia, Portugal, Ireland, Spain and Malta being notable exceptions.

Figure 3. Percentage of 4th graders without their own room, by parental education and country in 2016

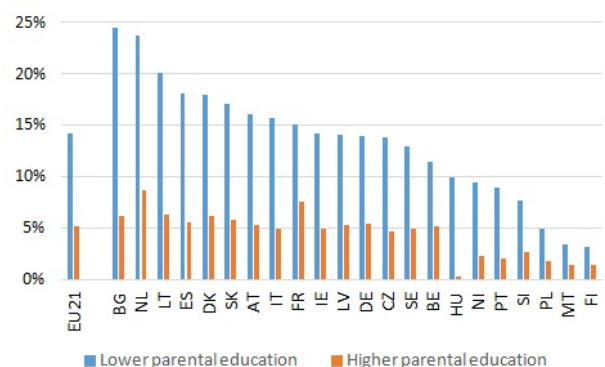


Source and note: see Figure 1.

A lack of reading opportunities suitable for children has also been identified as an important factor explaining educational achievement gaps. When schools are open, they can compensate for such disadvantages at least to some extent. According to PIRLS data, 57% (Belgium) to 99% (Latvia) of children have access to a school library in the par-

ticipating countries. During school closures however between 2% (Finland) and 17% (Bulgaria) of 10-year-olds have fewer than 26 children's books to read and no access to reading with a digital device (results not shown). Again, it is disadvantaged children who have fewer opportunities to read, as shown in Figure 4. During lockdown and for all countries no more than 6% of advantaged students lack access to reading material. In contrast, in 16 of the 21 countries examined at least 10% and up to 24% of disadvantaged children lack access to suitable reading material.

Figure 4. Percentage of 4th graders having fewer than 26 books at home and no electronic devices to use for reading, by parental education and country in 2016



Source and note: see Figure 1.

It is also noteworthy that for materially deprived children, schools are a main provider of daily meals. School closure therefore can lead to a loss of a key source of daily nutrition. While current data are not good enough to investigate this problem further, it is likely that hunger and lack of adequate nutrition will have had a great effect on the learning capabilities of poor children during school closure.

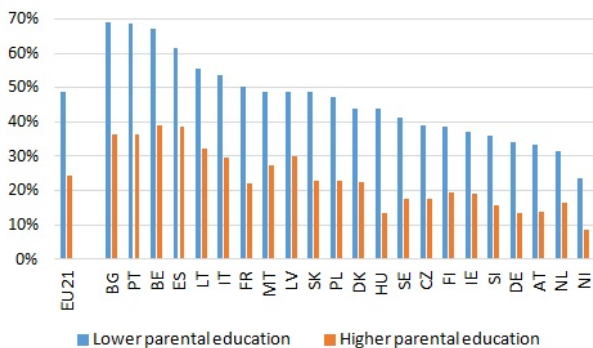
Varying parental involvement in children's development

Another key factor for learning success is parental support. Existing literature shows that during normal times parents with higher socio-economic status tend to be more involved in activities that positively influence children's learning outcomes. This is consistent with the results of Figure 5, which presents one measure of parental involvement – the percentage of parents saying that they do not often read to their pre-school children. However, it is not clear to what extent this measure is a good basis for hypothesising about parental involvement during school closures.

Quick Guide

This study uses data from the International Association for the Evaluation of Educational Achievement's 2016 Progress in International Reading Literacy Study (PIRLS) for the analyses. The PIRLS study measures children's reading performance with the PIRLS achievement scale, which has a centrepiece of 500 points, corresponding to the mean of the overall achievement distribution in 2001, the first year of the study, with a standard deviation of 100 points. The study focuses on primary 4th grade pupils (those in their fourth year of formal schooling, with a mean age at the time of testing of at least 9.5 years). In order to predict increases in education inequalities, we first run a simple ordinary least square (OLS) regression with achievement as dependent and parental education, school instruction time and an interaction variable of both as explanatory variables. Then we predict changes in the achievement gap by multiplying the significant interaction term with the instruction hours lost due to an 8-week period of physical school closure (which reflects the median time of school closure due to Covid-19 in the 21 European countries examined). This approach has a number of limitations. First, the prediction focuses only on the association of instruction time with achievement during school opening. During the pandemic, the association of lower instruction time with achievement could be different. Second, the analysis can neither account for the heterogeneous additional impacts of home schooling on achievement level nor for trajectories of educational inequalities. Third, the prediction does not consider that important school resources are not available for children during school closure. To estimate how educational disadvantages add up (Figure 6) we employ an OLS regression with reading achievement as dependent variable and resources and parental involvement as explanatory variables. Both regressions are conducted for the whole sample of 21 European countries covered (therefore estimating a European average association) and employ country fixed effects.

Figure 5. Percentage of 4th graders whose parents say that they do not often read to their pre-school children, by parental education and country in 2016



Source and note: see Figure 1.

For example, parents with lower education report getting involved with their children's homework more often than higher educated parents, according to PIRLS data on support for homework activities (not shown). Hence, it is obviously difficult to draw clear conclusions on parental involvement in learning support during physical school closures from data collected before the pandemic.

Covid-19 is likely to have affected families in different social positions in different ways and the impact of these heterogeneous effects on parents' involvement in their children's education is not yet clear. For example, on average, higher educated parents were

more likely to be working from home, and therefore struggling to balance work commitments and children's homeschooling needs. In contrast, lower educated parents were either more likely to continue working at their workplace or to lose their jobs. This indicates that compared to better-off parents, lower educated parents could have struggled more with finding time to look after their children or could have faced greater financial worries.

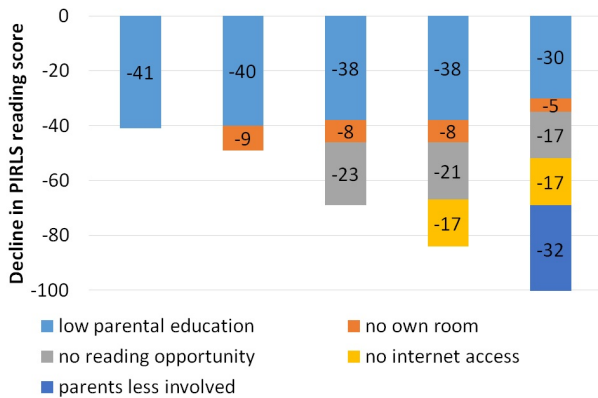
Disadvantages add up

Taking all countries together, more than one fifth of children lack at least two of the resources discussed above (i.e. their own room, reading opportunities, internet access, parental involvement). For children with lower educated parents the figure is 28%, compared with 10% for those with higher educated parents.

Figure 6 uses multivariate analyses to show how the accumulation of different disadvantages is associated with lower educational achievement, taking all 21 European countries together before Covid-19. Having lower educated parents is associated with a PIRLS score 41 points below that of advantaged pupils (see Figure 1). Children with no reading opportunities (fewer than 26 books and no reading devices at home) have a score that is on average 17 to 23 points lower than others (depending which other factors are taken into account). The scores for

those with no internet access and those who do not have their own room are on average 17 points and 5 to 9 points lower respectively. Children with parents who are less involved also tend to have a much lower performance level, independent of parental education and availability of resources.

Figure 6. Decline in PIRLS achievement score for lower parental education, no own room, no reading opportunities, no internet access and lower parental involvement for 21 European countries in 2016



Source: See Figure 1.

Note: Results derive from on OLS regressions, more details are provided in the Quick Guide.

These results suggest that those children who are likely to be the most severely hit by school closures were already lagging behind substantially before the crisis. Given that home resources will be more important during school closures than at other times, it is reasonable to assume that the associations between lack of resources and lower achievement increase during school closures, thereby further increasing educational inequalities in Europe.

Policy implications

An early assessment of the expected increase in the educational gap during the period of school closures underlines the need for targeted actions to help disadvantaged children catch up. Minimising the damage a prolonged period of physical school closures might cause in terms of educational inequalities needs to be the focus of any educational policy once schools reopen – and even before. For example, giving low, or even zero weights to the assessments young students received during this time and providing different forms of learning support based on an early assessment of children’s achievements after school restarts could play an important part in these efforts.

Related and future JRC work

Future JRC work will use post-Covid-19 educational achievement data, as well as a JRC survey which is currently being conducted, in order to investigate parental involvement and educational inequalities as a result of Covid-19. This brief is one of a series of ‘science for policy’ briefs reporting on recent JRC research on various aspects of fairness. A comprehensive report on fairness will be published in 2020.

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