

# Inequality in the effects of primary school closures due to the COVID-19 pandemic: evidence from the Netherlands

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## THE IMPACT OF THE COVID-19 PANDEMIC ON VULNERABLE POPULATIONS

### Inequality in the Effects of Primary School Closures due to the COVID-19 Pandemic: Evidence from the Netherlands<sup>†</sup>

By CARLA HAELERMANS, MADELON JACOBS, ROLF VAN DER VELDEN, LYNN VAN VUGT,  
AND SANNE VAN WETTEN\*

After one-and-a-half years of the COVID-19 pandemic and the associated school closures, the concerns around decreased learning growth and inequality are larger than ever. To develop targeted and future-proof policies, it is highly relevant to know whether the drop in learning growth that was observed after the first (two) period(s) of school closures in the first year of the COVID-19 pandemic (see Donnelly and Patrinos 2021 for an overview) has increased or decreased in the period that followed, in which there still was interrupted learning due to COVID-19.

Recent literature on the effects of the pandemic shows that there are large challenges with distance learning, such as access to digital learning devices (e.g., Chetty et al. 2020). Furthermore, other studies show a negative effect of distance learning (due to school closures) on student performance (e.g., Haelermans et al. 2022; Maldonado and De Witte 2021; Engzell,

Frey, and Verhagen 2021; Blainey, Hiorns, and Hannay 2020). Although schools have been striving to reduce the negative impact of school closure(s) on students' learning growth as much as possible—for example, by focusing mostly on the basic skills of mathematics and language—the question remains as to what extent the COVID-19 pandemic has increased the existing inequalities between students. Studies based on the first period of the COVID-19 pandemic in 2020 for the United Kingdom (Andrew et al. 2020), the Netherlands (Bol 2020; Engzell, Frey, and Verhagen 2021; Haelermans et al. 2022), and Belgium (Maldonado and De Witte 2021) give reason to believe inequalities have increased due to school closures.

These studies, for example, show that low-educated parents in the Netherlands felt less capable to help their children with homework (Bol 2020) and that working-class parents in the United Kingdom spent less time on home schooling than middle-class parents (Andrew et al. 2020).

More knowledge on the longer-term development of learning growth due to the global COVID-19 pandemic is necessary to obtain more insights into the negative effects. It is important to know whether the decreased learning growth that was observed after the first half-year of the COVID-19 pandemic has worsened in the school year thereafter (2020–2021, in which the pandemic continued) and what the current state of affairs is one-and-a-half years into the pandemic. Knowledge about the (presumably negative) effects and inequalities at both the student and school level is valuable not only for schools, but also for policymakers who must determine future steps to prevent aggravated inequalities.

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TABLE 1 – OVERALL EFFECT OF COVID-19 PANDEMIC ON LEARNING GROWTH

	Composite score	Reading	Spelling lower grades	Spelling upper grades	Mathematics
1.5 years during COVID-19	-0.078 (0.006)	-0.068 (0.007)	-0.066 (0.009)	0.085 (0.011)	-0.107 (0.007)
Observations	535,323	283,611	227,984	192,250	494,514
$R^2$	0.02	0.001	0.001	0.002	0.003
N of schools	1,899	1,883	1,876	1,858	1,898

*Notes:* Robust standard errors clustered at the school level in parentheses; coefficients presented in terms of SD. Spelling lower grades = grades 2 and 3; spelling upper grades = grades 4 and 5. Note that observations for reading are lower, as there is no reading test in grade 1, and not all schools administer the reading tests.

## I. Data and Methodology

This paper is based on analyses with unique data that are used to study how one-and-a-half years of the COVID-19 pandemic have affected learning growth and inequalities in Dutch primary education and how the effect of the pandemic differs across school subjects and across students with different backgrounds. To understand how learning growth and inequalities have developed over the course of the COVID-19 pandemic, we analyze the period of one-and-a-half years since the start of the pandemic in which two school closures took place. The unique dataset concerns information on standardized test scores in primary education that are written twice a year that were recently collected as part of the Netherlands Cohort Study on Education (see Haelermans et al. 2020). The dataset includes data on Dutch primary students from about 1,900 schools (around 30 percent of all primary schools in the Netherlands), with standardized test scores for reading, spelling and mathematics as well as detailed (social) background information on the students. Students' learning growth is calculated as the difference between the midterm test that took place right before the COVID-19 pandemic that began in February 2020 and the end-of-term test in June 2021 after one-and-a-half years of interrupted learning (with two school closures and irregular education at school during most of the rest of the time). Next to the three subjects separately, we create a composite score that is an average of the standardized learning growth of the three subjects. Resembling a difference-in-difference design, this COVID-19 period of learning (treatment period) is compared with similar periods in the previous two years (control

periods). In other words, the COVID cohort is compared with cohorts that took the midterm test in February 2017 (2018) and the end-of-term test in June 2018 (2019), well before COVID-19 happened. The analyses include grades 1–5 of primary education for mathematics and spelling and grades 2–5 for reading (as there is no midterm test for reading in grade 1). For comparison reasons, we standardize the learning growth per subject, grade level, and year for the pre-COVID-19 cohorts and standardize the COVID-19 cohort based on the pooled average and standard deviation (SD) of the two previous cohorts. This allows us to compare the effect between subjects and between grade levels. See the online Appendix for more information.

A major benefit of the Netherlands Cohort Study on Education is that the dataset also contains extensive information on students' family background and school characteristics, based on register data for the full population of Dutch schools and students. In this paper, we investigate inequalities in learning growth between students using interaction terms between these variables and the treatment. At the student level, we look at students' socioeconomic status, parents' education level, household income, household structure, family size, and migration status.

## II. Results

The analyses based on the Dutch data for reading, spelling and mathematics after one-and-a-half years of the COVID-19 pandemic (see Table 1) show that learning growth for reading is 0.07 SD lower than normal during these periods and 0.11 SD lower for mathematics. For

TABLE 2—DIFFERENTIAL EFFECT OF COVID-19 PANDEMIC ON LEARNING GROWTH BY STUDENT CHARACTERISTICS (COMPOSITE SCORE)

	SES	Parental education	Household income	Household structure	Family size	Migration status
Medium group	−0.055 (0.007)	−0.021 (0.007)	−0.031 (0.005)			
Highest group	−0.028 (0.008)	0.028 (0.008)	0.011 (0.006)	0.001 (0.005)	−0.022 (0.004)	−0.135 (0.008)
Lowest group	−0.111 (0.011)	−0.146 (0.014)	−0.120 (0.011)	−0.131 (0.012)	−0.122 (0.011)	−0.135 (0.013)
Medium group × Treatment	0.024 (0.009)	0.008 (0.009)	0.031 (0.007)			
Highest group × Treatment	0.054 (0.011)	0.030 (0.012)	0.034 (0.009)	0.029 (0.007)	0.020 (0.005)	0.038 (0.009)
Constant	0.058 (0.008)	0.072 (0.011)	0.067 (0.009)	0.058 (0.008)	0.071 (0.008)	0.133 (0.007)
Observations	535,323	476,939	531,808	531,586	534,621	535,218
R <sup>2</sup>	0.003	0.004	0.003	0.003	0.003	0.006
N of schools	1,899	1,898	1,899	1,899	1,899	1,899

*Notes:* Robust standard errors clustered at the school level in parentheses; coefficients presented in terms of standard deviations. All models (except the first) include the interaction between treatment and socioeconomic status on top of the student characteristic of interest. Household structure: lowest = one-parent household, highest = two-parent household; Family size: lowest = large family (>2 children), highest = small family (<2 children); Migration status: lowest = non-Western migration status, highest = no migration status.

spelling, we find differentiated results. For the lower grade levels (grades 2 and 3), we see that the learning growth is 0.07 SD lower than before the COVID-19 pandemic, whereas for the upper grade levels (grades 4 and 5), the average learning growth is even higher than it was before the pandemic. The composite score shows that the overall effect of the COVID-19 pandemic is a 0.08 SD lower learning growth compared with previous cohorts. For reasons of brevity, below we only present the differentiated results for the composite score.

To put these effects a bit more into perspective, we recalculate the standardized effects to the number of weeks in a school year. Earlier, Engzell, Frey, and Verhagen (2021) concluded that the learning loss after the first period of school closures in the Netherlands was around eight weeks (exactly the number of weeks the schools were closed). They based their calculations on estimates from the literature that the average yearly learning growth in primary education lies between 0.3 and 0.6 SD (Bloom et al. 2009), with a more recent study by the World Bank indicating that this number is around 0.4 SD per year (Azevedo et al. 2020). For fair comparison with the number of weeks estimated by

Engzell, Frey, and Verhagen (2021), we base our analyses on the same literature and assumptions. Given the average standardized effect of 0.08 SD, this implies an average lower learning growth of around 5.5 weeks, recalculated to a full school year of 40 weeks, varying between 7.5 for mathematics and 4.5 for reading and for spelling in lower grades. If we were to assume that average yearly learning growth is at the lower (upper) end of the estimated range of 0.3 (0.6) SD per year, we would conclude that the average lower learning growth was around 7 (3.5) weeks.

Further analyses on inequality between students (see Table 2) show that the lower learning growth is almost completely driven by vulnerable students with low socioeconomic status, with low-educated parents, with parents with low income levels, with single-parent households, and with non-Western migration backgrounds. For family size, we do not find differential effects of the COVID-19 pandemic on learning growth. In other words, the delay in learning growth is the largest for the more vulnerable students who were already disadvantaged in comparison with their peers long before the COVID-19 pandemic.

### III. Conclusions

The results described in this paper show that schools matter, particularly for the most vulnerable groups of students. These findings, after one-and-a-half years of the COVID-19 pandemic and the comparison of these findings with earlier literature that studies different periods within this pandemic, show that although distance learning may prevent part of the damage, it cannot compensate for classroom teaching. Furthermore, the findings show that schools and students could not yet undo the lower learning growth that occurred in the first half-year of the COVID-19 pandemic. This is despite the fact that schools had focused almost completely on the basic mathematics and language skills during the academic year 2020–2021, as almost all other (social) activities were cancelled.

In comparison with the lower learning growth that was observed after the first four months (Haelermans et al. 2022) and first full year of the COVID-19 pandemic (Haelermans et al. 2021), we observe large differences in how much schools and students were able to catch up on the original lower learning growth. Although schools and students are not there yet, they have successfully caught up with part of the previously established delay during the first school closure, despite the fact that the pandemic had also messed up school year 2020–2021. However, the inequality across the different groups of students at these three subjects has hardly changed between the periods. This implies that the catching up has occurred broadly equally between students with different socioeconomic backgrounds.

These findings therefore call for an (inter)national focus on reducing the lower learning growth of students in general and of the more vulnerable students and schools most importantly. It is worrisome, and unfortunately not unlikely, that the increased inequalities in learning loss due to the pandemic may lead to long-lasting inequalities (Kautz et al. 2014), deepening the gap in adult outcomes between these groups in the population. This very much stresses the need for targeted interventions to reduce the current inequalities in learning loss caused by the pandemic. However, targeted interventions are not enough, as there were already some interventions in place in the second part of the COVID-19 pandemic (the academic year 2020–2021). These interventions were mostly remedial teaching

programs, which were specifically targeted at the lower-performing and more vulnerable children. Since inequalities have remained the same since the beginning of the pandemic, this seems to not have helped in reducing these inequalities. On the other hand, we cannot rule out that these targeted interventions are part of the reason that more vulnerable students did not continue to grow worse relative to their less vulnerable peers over the course of the pandemic.

We can draw several policy implications from these conclusions, at both the country and school level. First of all, targeted interventions for vulnerable groups are necessary to close the widened achievement gaps by student background. Secondly, available money and resources should be disproportionately allocated to schools with a higher share of vulnerable students. A third policy conclusion is that all targeted interventions should be evidence based, to avoid spending a lot of money on educational programs that may not yield results, and be group specific for the vulnerable groups. Furthermore, students' access to these interventions should not depend on their parents' motivation or willingness to opt in. Lastly, in the event of another pandemic, or in case the current COVID-19 pandemic continues, schools should only be closed as a very last resort to avoid further inequalities.

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