A systematic review & meta-analysis of the evidence on summer learning

Educational policies research group

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Background

A recent systematic review and meta-analysis has shown that children have suffered large learning deficits during the COVID-19 pandemic (Betthäuser et al. 2023). Averaging across countries and age groups, children have lost 35 percent of what they would have learned in a regular school year. Learning deficits arose early in the pandemic and tend to persist (see Fig. 1). Learning deficits are particularly large for children from lower socio-economic backgrounds, thus increasing educational inequality (see Fig. 2). Moreover, educational inequality at the global level increased, as children in poorer societies experienced larger learning deficits than their peers in economically advanced societies. In light of the substantial learning deficits that emerged during the COVID-19 pandemic, it is more important than ever to understand how education policies can help children recover learning deficits and how they can reduce learning gaps between children from different socio-economic backgrounds.

Methodological approach

We use the state-of-the-art approach to conducting systematic reviews and meta-analyses, as set out in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

Search strategy: We consider all types of primary research, including peer-reviewed publications, preprints, working papers, and reports. We systematically search relevant international databases from different academic disciplines and relevant policy websites.

Quality appraisal: We assess the methodological rigor and transparency of each study using the Risk Of Bias In Non-randomized Studies of Interventions (ROBINS-I) tool (Sterne et al., 2016) and rate the robustness of the overall body of evidence. Moreover, we assess the risk of publication bias using a combination of analytical tools.

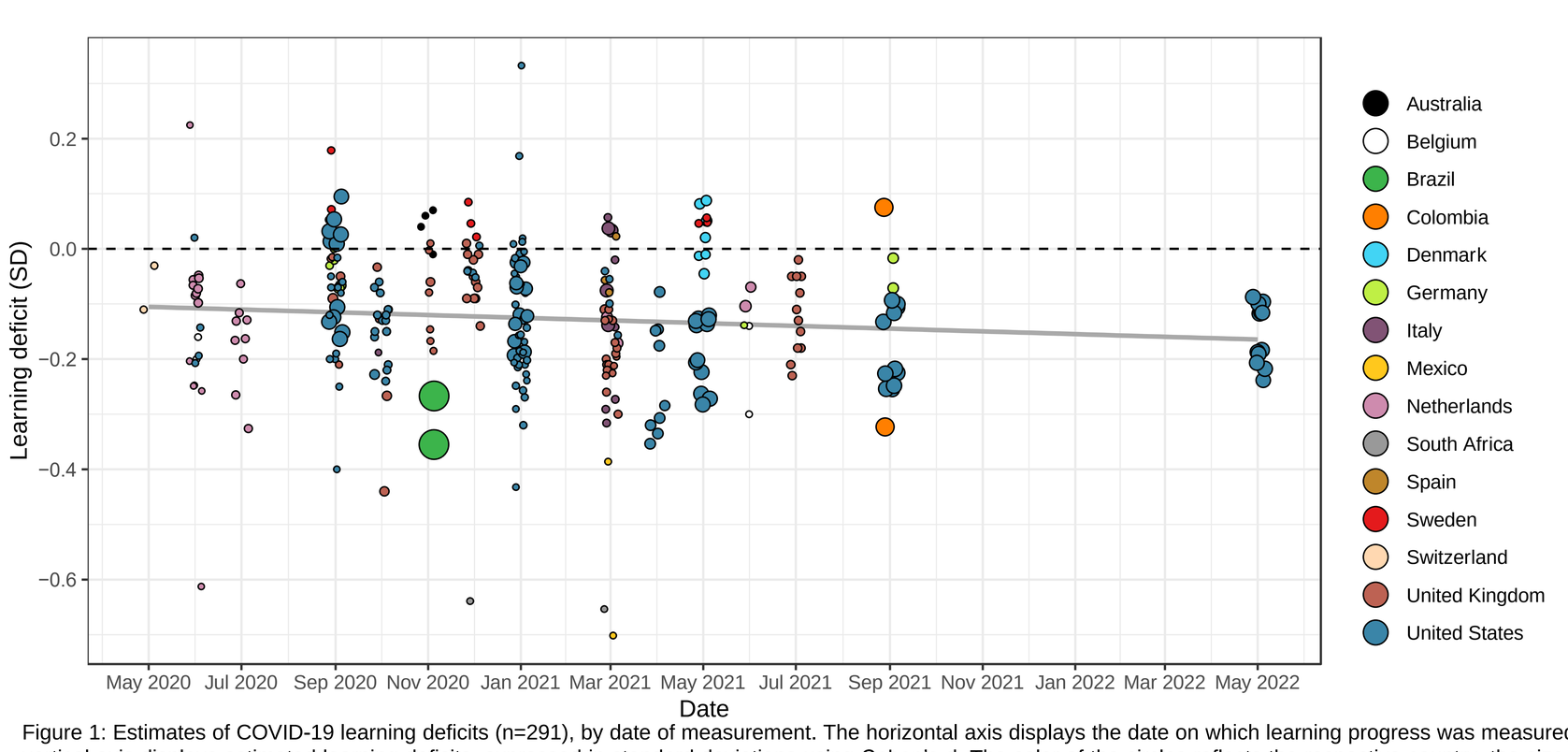

Figure 1: Estimates of COVID-19 learning deficits (n=291), by date of measurement. The horizontal axis displays the date on which learning progress was measured. The vertical axis displays estimated learning deficits, expressed in standard deviations using Cohen's d. The color of the circles reflects the respective country, the size of the circles indicates the sample size for a given estimate, and the line displays a linear trend with a 95% confidence interval. Source: Betthäuser et al. 2023

Aims and research questions

We conduct a systematic review, quality appraisal, and meta-analysis of the existing literature on the effect of summer learning programs on learning progress and inequality. More specifically, our project makes two main contributions.

First, we will review and quality appraise the up-to-date body of evidence on the effect of summer learning programs on learning progress inequality, as well as its geographic reach and quality. More specifically, we ask (1) How much evidence is there on the effects of summer learning programs on learning progress? and (2) What is the quality of the existing evidence?

Our second contribution is to harmonize, synthesize and meta-analyze the existing evidence, with a focus on variation across different groups of students, different learning subjects, and key characteristics of summer learning programs. Based on the pooled evidence from all identified studies, we ask (3) what is the effect of summer learning programs on the learning progress of school-aged children?, (4) do effects of summer learning programs last or fade-out?, (5) which characteristics of summer learning programs are associated with children's learning progress?, (6) to what extent does the effect of summer learning programs differ across children from different socio-economic backgrounds, different age-groups, and between girls and boys?, and (7) to what extent does the effect of summer learning programs differ across subject domains (such as math and reading)?

Meta-analysis: We draw on methods from different disciplines to synthesize and meta-analyze the information extracted from the included studies. We use forest plots and random-effects models to visualize and pool effect size estimates from all included studies (Borenstein et al., 2010). We use harvest plots, violin plots, scatter plots, and multiple regression analyses to examine and visualize how effect sizes vary across children from different socio-economic backgrounds, across different grade-levels, across girls and boys, and across learning subjects.

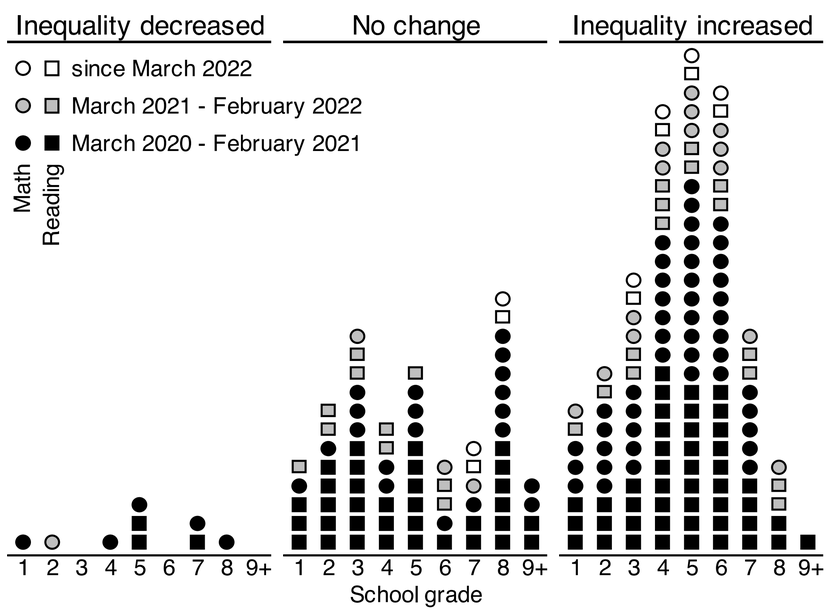

Figure 2: Harvest plot summarizing the evidence on the effect of the COVID-19 pandemic on educational inequality between students from different socio-economic backgrounds. Each circle/square refers to one estimate of over-time change in inequality in math/reading performance (n=211). Estimates that find a decrease/no change/increase in inequality are grouped on the left/middle/right. Within these categories, estimates are ordered horizontally by school grade. The shading indicates when in the COVID-19 pandemic a given measure was taken. Source: Betthäuser et al. 2023

References

Betthäuser, Bastian A., Anders M. Bach-Mortensen, and Per Engzell. 2023. 'A Systematic Review and Meta-Analysis of the Evidence on Learning during the COVID-19 Pandemic'. *Nature Human Behaviour* 1–11. https://doi.org/10.1080/10824669.2012.717036

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