

An Analysis of COVID-19 Student Learning Loss

Harry Patrinos, Emiliana Vegas and Rohan Carter-Rau

January, 2024

Motivation

- The COVID-19 pandemic led to school closures around the world, affecting almost 1.6 billion students
- Even short interruptions in a child's schooling significantly negatively affect their learning and can be long-lasting
- The capacities of education systems to respond to the crisis by delivering remote learning and support to children and families have been diverse and uneven
- Understanding the extent to which Covid-19 led to student learning losses across the world is important to develop strategies to mitigate the negative impacts of the COVID-19 school closures

Key findings

- Length of school closures varied widely across countries
- The longer the schools remained closed, the greater the learning losses
- For the 19 countries with robust learning loss data, average school closures were 15 weeks, leading to average learning losses of 0.18 standard deviations.
 - for every week that schools were closed, learning declined by an average of 0.01 standard deviations

Search strategy

- ECONLIT, Google Scholar, PubMed, Education Resources Information Center, and Cochrane Library.
- Coronavirus Research Database, Education Database (ProQuest), Web of Science.
- Preprint and working paper repositories: SSRN, MPRA, IZA, NBER, OSF Preprints, PsyArXiv, SocArXiv, EdArXiv
- Reach out to researchers
- Keywords: “Covid-19”, “coronavirus”, “2019-ncov”, “sars-cov-2”, or “cov-19”, in combination with “learning loss”, “learning slide”, “education gap”, or “achievement gap”
- Focus on school-age children (ages 5-18) across all subjects, with special attention to math & reading.

Inclusion & exclusion criteria

- Include a valid measure of learning progress
 - Reported impacts on learning progress due to COVID-19 school disruptions
 - Excluded studies that did not analyze student-level data or evaluate impacts on learning progress, reported analyses occurring before the onset of COVID-19 or hypothesized results.
- Our search and application of inclusion & exclusion criteria resulted in 67 studies.

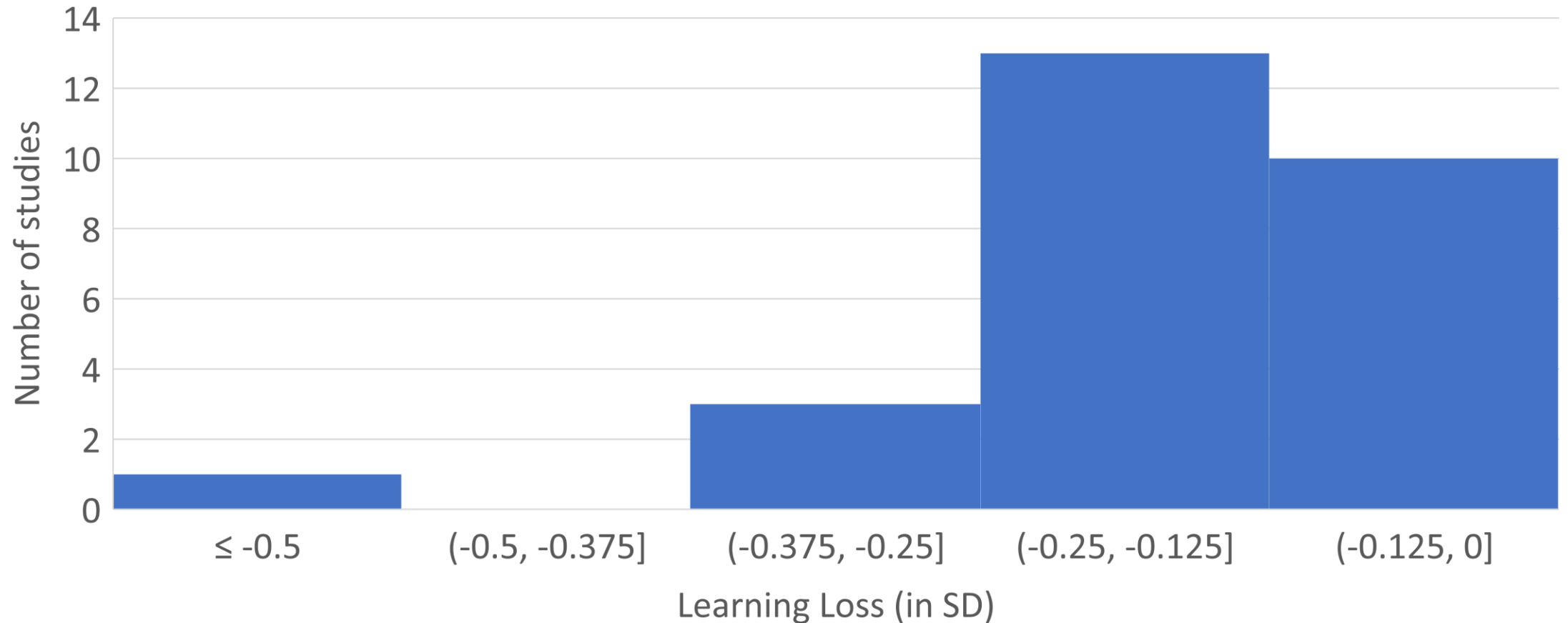
Analytical review & effects reporting

- 67 studies were carefully reviewed, and their methods scored on a scale of 1 to 5, where:
 - 1 = presented learning loss through a comparison of pre- and post- covid means.
 - 2 = performed difference of means tests but used convenience sampling or had small sample sizes.
 - 3 = performed difference of means tests, had random or representative sampling, and a relatively large sample size.
 - 4 = performed additional statistical analysis beyond a comparison of means, including strong sampling and basic individual or school-level controls.
 - 5 = contained sophisticated statistical analysis, with strong controls and sampling.
- This systemic review focuses on the **35 studies** that are scored 3, 4, and 5.

Final dataset

Source	Methods Score	Country	Closure length weeks	Average learning losses (SD)	Equity impact	Sample size
Ardington et al 2021	5	South Africa	22	-0.22	Yes	5,810
Arenas and Gortazar 2022	5	Spain	12	-0.05	Yes	41,000
Asakawa and Ohtake 2021	5	Japan	11		Yes	5,400
Bielinski et al 2021	5	USA		-0.14	No	n/a
Birkelund and Karlson 2021	5	Denmark	8	0	Yes	200,000
Borgonovi and Ferrara 2022	5	Italy			Yes	850,000
Chen et al 2021	3	UAE				1,920
Clark et al. 2021	4	China	7	-0.22		1,835
Contini et al 2021	5	Italy	15	-0.19	Yes	1,539
Domingue et al 2021	4	USA		-0.05	No	100,000
Engzell et al 2021	5	Netherlands	8	-0.08	Yes	350,000
EPI 2021	4	England		-0.09	Yes	180,000
Gambi and De Witte 2021	5	Belgium	9-12	-0.23	Yes	213000
Gore et al. 2020	5	Australia	8	0	No	100 to 500
Haelermans et al 2021	5	Netherlands	10	-0.17	Yes	201,819
Halloran et al 2021	5	USA			Yes	11,700
Hevia et al 2021	3	Mexico	48	-0.55	Yes	3,161
Hicks and Faulk 2022	4	USA			Yes	n/a
Jakubowski 2022	4	Poland	29	-0.30		4,581
Kogan and Lavertu 2021	5	USA		-0.23	Yes	124,700
Korbel and Prokop 2021	4	Czech		-0.11		2,234
Kuhfeld et al 2022	4	USA		-0.19	Yes	5,400,000
Lichand et al 2021	5	Brazil		-0.32	Yes	7,000,000
Locke et al 2021	3	USA		-0.15	No	55,000
Ludewig et al 2022	5	Germany		-0.14		4,290
Maldonado and Witte 2022	4	Belgium	9	-0.18	Yes	1,300
Erdem and Lesnick 2021	3	USA				65,000
Pier et al 2021	5	USA		-0.08		100,000
Schult et al 2021	3	Germany	10	-0.08		80,000
Schuurman et al 2021	3	Netherlands	8	-0.09	Yes	886
Skar et al 2021	5	Norway	7	-0.24		2,453
Spitzer, Musslick	4	Germany	8			2,500
Tomasik et al 2020	3	Switzerland	8	-0.20		28,685
van der Velde	4	Netherlands	8			133,450
Chaban et al 2022	5	Russia	8 - 20	-0.27	No	165.740

Range of learning loss (in SDs) in the 24 studies reporting comparable effect sizes



Length of school closures and average learning losses, by country

Country	Closure length weeks	Average learning losses (SD)	Source
Mexico	48	-0.55	Hevia et al 2021
Brazil	26	-0.32	Lichand et al 2021
Poland	20	-0.3	Jakubowski 2022
Russia	14	-0.27	Chaban et al 2022
Norway	7	-0.24	Skar et al 2021
China	7	-0.22	Clark et al. 2021
South Africa	22	-0.22	Ardington et al 2021
Switzerland	8	-0.2	Tomasik et al 2020
Italy	15	-0.19	Contini et al 2021
Belgium	9-12	-0.18	Gambi and De Witte 2021; Maldonado and Witte 2022
Netherlands	10	-0.17	Haelermans et al 2021
Germany	10	-0.14	Ludewig et al 2022
USA	23	-0.14	Average of: Bielinski et al 2021; Domingue et al 2021; Kogan and Lavertu 2021; Kuhfeld et al 2022; Locke et al 2021; Pier et al 2021
Czech	9	-0.11	Korbel and Prokop 2021
England	10	-0.09	EPI 2021
Spain	12	-0.05	Arenas and Gortazar 2022
Australia	8	0.00	Gore et al. 2020
Denmark	8	0.00	Birkelund and Karlson 2021
Japan	11	0.0	Asakawa and Ohtake 2021

Concluding remarks

- As a result of the first wave of COVID-19-induced lockdowns and school closures beginning in March 2020, students lost on average about 1/3 to 1/2 year's worth of learning.
- These learning losses may impact a student's education trajectory, as the lost learning is likely to limit opportunities to advance to higher levels of schooling.
- There are also long-term future earnings losses associated with lost human capital, with students potentially losing trillions of dollars in future income (Psacharopoulos et al., 2021).
- As this emerging evidence suggests, the impact of COVID-19 on student learning worldwide has been substantial, and inequality in learning across more advantaged and disadvantaged groups is likely going to grow over time.