



Learning on Hold: The Toll of COVID-19 School Closures on Mozambique's Foundational Literacy

Summary

In Mozambique, the COVID-19 pandemic led to schools closing for 80 per cent of the 2020 academic year, affecting 8.5 million students and nearly 15,000 schools across the country (United Nations, 2020). An analysis of pre- and post-pandemic reading skills, using data from the Avaliação Longitudinal da Desistência Escolar (ALDE, Longitudinal Assessment of School Dropout) reveals significant learning losses in basic literacy skills. Across the country, children in Grades 3–4 showed reduced proficiency in identifying letters in 2021, compared to students in the same grades in 2019.

Key Messages

- Students in Grades 3–4 in Mozambique experienced learning loss during the COVID-19 pandemic, with a significant decrease in the number of letters correctly identified after school closures.
- Household wealth and school resources are the most significant factors associated with letter name identification and reading scores.
- For familiar word reading, the most associated factors are wealth, death in the family, and school-related factors (being equipped with toilets and lighting, having supervision visits and having more full-time teachers).
- There was no clear evidence of changes in scores for the familiar word reading subtask, which were low both pre- and post-pandemic.

Introduction

The COVID-19 pandemic caused widespread disruption to education systems across the world, particularly in low-income countries, and Mozambique was no exception (Moscoviz & Evans, 2022). The pandemic-induced school closures further devastated the already precarious educational situation in the country, as evidenced by the fact that only 4.9 per cent of third-grade students were reading at the expected level in 2016 (World Bank, 2020). In light of this, this brief seeks to address two crucial questions regarding Mozambique's Grade 3 and 4 students. First, what is the current state of reading outcomes of these students, and how have they been affected by the prolonged school closures? Second, how do children's individual, household and school characteristics relate to literacy outcomes?

Using data from surveys conducted in 2018, 2019 and 2021 as part of the Longitudinal Assessment of School Dropout or Avaliação Longitudinal de Desistência Escolar (ALDE), this study combines data from a literacy assessment with students' demographic background and school-level factors to answer these questions. ALDE is a nationally representative longitudinal survey of 5,400 primary school children in Mozambique, spanning 60 schools across 11 provinces of the country.¹ The survey was administered to students as well as their caregivers, teachers and school principals. To date, three rounds of data have been collected: in 2018, 2019 and 2021.²



1 ALDE contains information on students, their educational experience, families and schools. The Early Grade Reading Assessment (EGRA) contains results from a literacy assessment administered to ALDE participants to gauge students' foundational literacy skills. Combining these two datasets allows for the analysis of how literacy has changed since the COVID-19 school closures as well as which student and school characteristics influence literacy outcomes.

2 The qualitative component (focus groups and key informant interviews) was conducted in 2021.

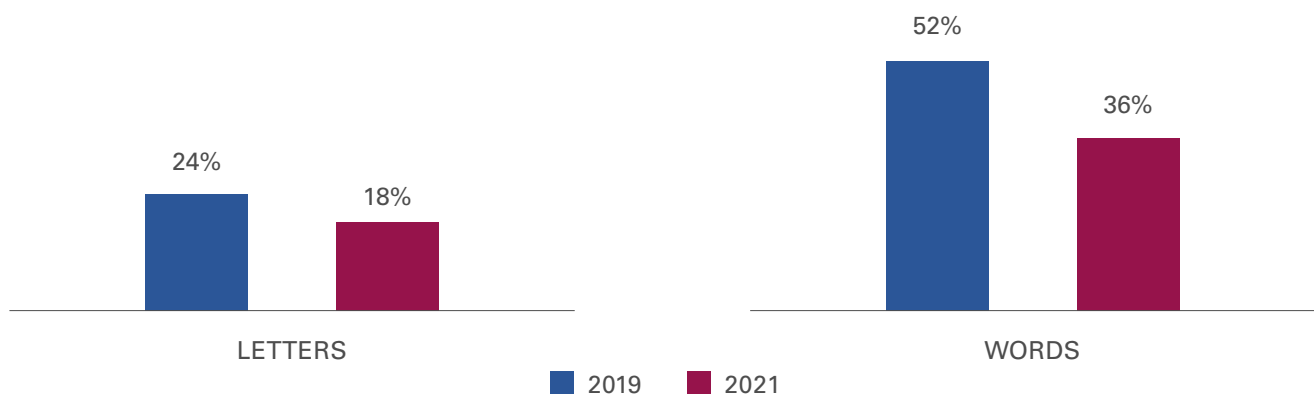
Measuring literacy skills

The Early Grade Reading Assessment (EGRA)³ is a widely used tool to measure students' reading readiness. One of the earliest skills it measures is letter name identification and reading, which refers to a student's ability to recognize letter names, a critical literacy skill that strongly correlates with early reading success (Ehri et al., 1985; Brady, 1991). Typically, this skill is acquired in Grade 1 or earlier. EGRA subtask that assesses this skill involves presenting students with 100 letters and asking them to identify as many letters as possible within one minute, with one point awarded for each correct answer.⁴

Results from the EGRA reveal that students, on average, could identify only a few letters. In 2019, 24 per cent of Grades 3 and 4 students received a zero score, meaning that they were unable to recognize any letters (Figure 1). In the same year, 52 per cent of students scored zero on the familiar word reading task, which assesses a slightly more advanced early literacy decoding skill, also expected to begin in Grade 1. For this task, students were presented with 50 words and asked to read as many as possible within one minute, with one point awarded for each correctly read word.⁵

Across both tasks, at surface level, the average number of children with a zero score decreased between 2019 and 2021. This could be because students are now two years older and therefore more likely to recognize at least one letter or word. Zero scores are a useful method to gauge the overall level of reading preparedness or illiteracy in a group, but are not designed to provide more nuanced insight. While a cursory look indicates that there is progress, the following analysis of actual scores tells a different story.

Figure 1: The proportion of zero scores across years for students in Grades 3–4



Note: The total sample of children in Grades 3–4 is 884 in 2019, and 1,177 in 2021. Students were assessed at the same time as the data collection for ALDE, in September and October 2019 for the first round, and then in June and July 2021 for the second round. For both subtasks, there was a large decrease in the number of children with a zero score from 2019 to 2021, statistically significant at the one per cent level. N=2,061.

After schools reopened, students in comparable grades recognized fewer letters than in 2019. Figure 2 illustrates the average number of letters correctly identified by grade level, while Figure 3 estimates the average points scored across grades. For example, pre-pandemic, Grade 3 students could identify an average of 12.8 letters; post-pandemic, Grade 3 students could only identify 6.3 letters. Grade 4 students witnessed a decline in their average scores from 21.8 in 2019 to 15.8 letters in 2021. Annex Table 1 presents the results

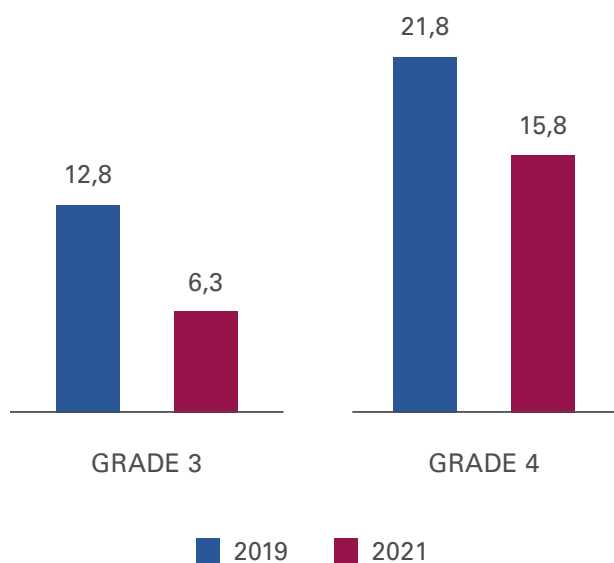
³ EGRA is a literacy assessment created by Research Triangle International (RTI) with support by the US Agency for International Development in 2006, and as of 2014 it had been implemented in more than 65 countries. The assessment aims to measure the three foundational skills necessary to read: phonological awareness, print knowledge and orthographic knowledge (Dubeck et al., 2015). It was constructed for early-grade students, mostly in Grades 1–3. In this study, a decision was made to include Grade 4 students. EGRA is administered one-on-one with a trained assessor, reading from a piece of paper. EGRA scores should be interpreted as a snapshot of student learning levels at one point in time and were not designed to have benchmarks. Instead, EGRA scores can be used to measure changes in student learning over time. For a comprehensive theoretical and practical background on EGRA, see Dubeck et al. (2015).

⁴ If students were unable to read any of the letters in the first line – around ten letters – the task was discontinued.

⁵ If students were unable to read any of the words in the first line – around five words – the task was discontinued.

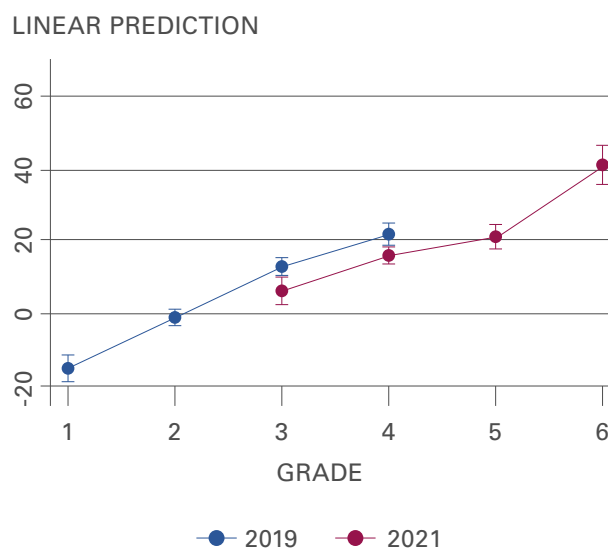
of the regression estimations used to compute the average scores. Annex Table 2 shows the distribution of scores, including the high number of zero scores in the left-hand figures, which include zero scores for 2019 and 2021. In right-hand figures, the score distribution excluding zero scores is shown, which still exhibits a considerable degree of clustering toward zero.

Figure 2: EGRA subtask: letter identification for Grades 3–4, average scores



Note: Predictive margins using tobit to account for lower bound censoring of data, statistically significant at the 1% level.

Figure 3: EGRA subtask: letter identification trends, average scores



Note: Predictive margins using tobit, showing predictive margins across all grades and 95% confidence intervals. While negative scores are not observed, the tobit model uses the latent score variable (censored at zero), resulting in scores less than zero.

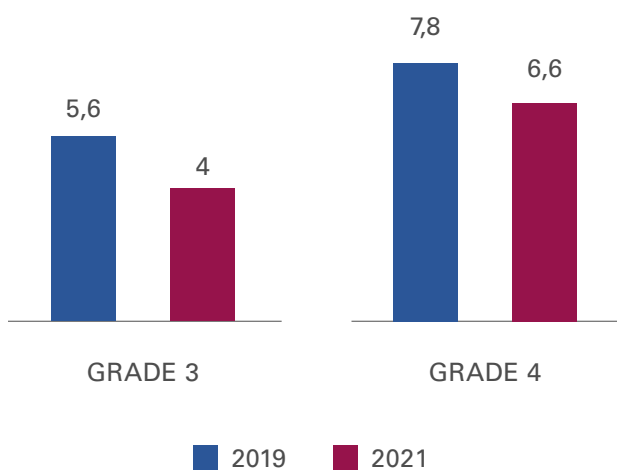
To provide context for the EGRA subtask scores, they can be compared with results from an EGRA assessment conducted as part of the Aprender A Ler (ApaL) literacy intervention programme. In 2015, the Mozambique Ministry of Education and Human Development (MINEDH) and USAID implemented the ApaL assessment with primary school children in six districts in Nampula and Zambézia provinces (Raupp et al., 2016). In the control group, EGRA results of Grade 3 students scored 12.6 letters for letter identification and 3.3 words for familiar word reading. Students who had fully completed the literacy programme scored 20.1 letters and 5.7 words. Loosely comparing the ApaL scores with results from this research indicates similarly low levels of reading for Grade 3 students. However, comparisons should be interpreted with caution as EGRA instruments were not designed to be compared within or across countries (Dubeck et al., 2015).⁶

For the second EGRA subtask, familiar word reading, on average, Grade 3 students could read 5.6 words in 2019 and 4 words in 2021, while Grade 4 students could read 7.8 words in 2019 and 6.6 words in 2021 (Figure 4). For this task, the differences between the pre-and post-pandemic scores (Figure 5) were not statistically significant, and students performed similarly poorly across both test years.⁷ While post-pandemic scores show that more students recognized at least one word (see the right-hand panel of Figure 1), there was no apparent improvement in familiar word reading across years.

⁶ To understand the literacy levels of comparable countries in sub-Saharan Africa, RTI International (2015) has compiled a review of 20 countries in the region, including Mozambique.

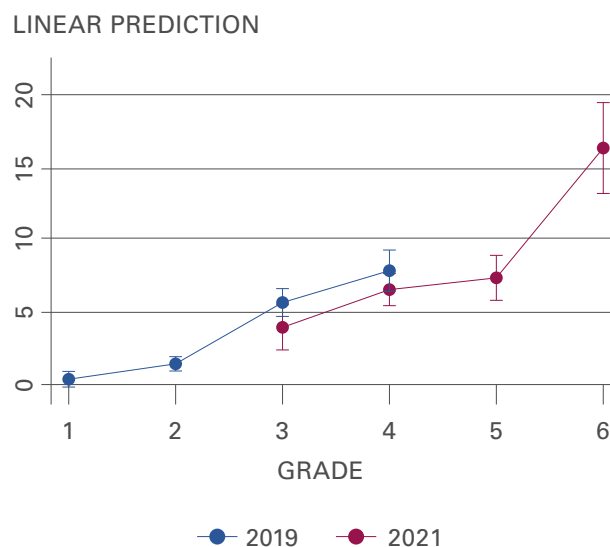
⁷ Results from the regression estimations are included in Annex Table 3.

Figure 4: EGRA subtask: familiar word reading for Grades 3–4, average scores



Note: Predictive margins using OLS. In the analysis (see Annex Table 3), tobit is used with OLS as a robustness check, showing consistent results. Here, we present results from the OLS estimation to avoid negative scores for ease of interpretation.

Figure 5: EGRA subtask: familiar word reading trends, average scores



Note: Predictive margins using OLS, showing predictive margins across all grades and 95 per cent confidence intervals. In the analysis (see Annex Table 3), tobit is used with OLS as a robustness check, which shows consistent results. Here, we present results from the OLS estimation to avoid negative scores for ease of interpretation.

What factors influence early literacy?

An analysis was conducted to examine the factors associated with literacy scores and to understand the opportunities and challenges for promoting literacy among primary school students.⁸ The analysis measured the relationship between various individual, household and school traits in relation to literacy scores for letter name identification and reading and familiar word reading. Because these skills are learned sequentially and require different inputs to learn and retain, it was assumed that different factors could influence them, requiring separate analyses.

Letter name identification and reading

The complete list of variables included in the analysis and their definitions is given in Annex Table 4. For the more basic subtask, letter name identification and reading, factors that were strongly associated with higher scores included household wealth (e.g. owning a television), school resources (e.g. having lighting), and living in a household with other school-age children (possibly a peer learning effect). Surprisingly, there was no direct relationship between gender and scores, nor many school-level variables such as having a female teacher or a latrine, while these are contributors to better retention in education according to previous research with data from ALDE (UNICEF et. al, 2022).

8 Regression analysis was used to measure the relationship between test scores and student, household and school characteristics. The raw test scores for letter identification (0–100) and word identification (0–50) were modelled as a function of time, gender, age, grade level, a vector of individual characteristics, a vector of household characteristics, a vector of school characteristics, being in a rural area, and province-level fixed effects (a complete list of control variables is included in Annex Table 4). Because many students could not identify any letters or words (see Figure 1), the data were not normally distributed and were left-skewed. To estimate EGRA subtasks scores, a censored tobit model was employed to account for lower-bound censorship at zero. The main specifications included in Annex Table 1 and Annex Table 3 also controlled for interaction terms between gender and initiation rites; age and grade; and time, grade and rural location. Several robustness checks show that the results did not differ across several estimation methods: panel data estimation with school fixed effects, panel data estimation with random effects, ordinary least squares (OLS), subsample analysis by grade level and truncating scores below one.

Familiar word reading

As opposed to reading letters, for the familiar word reading subtask, there were several pronounced individual-level variables strongly correlated with test scores. The number of meals eaten daily and school attendance positively correlate with scores. While gender is not associated with test scores, being a female student who had undergone initiation rites was negatively associated with test scores. At the household level, wealth (having a television and students having their own room) positively correlates with test scores. Along these financial lines, death in the family of an income-earning person is negatively associated with test scores. At the school level, familiar word reading scores are positively associated with toilets, lighting, supervision visits, and having more full-time teachers. In contrast, factors that have a negative association include a larger school population, larger class size, and being in a school with multigrade classes.

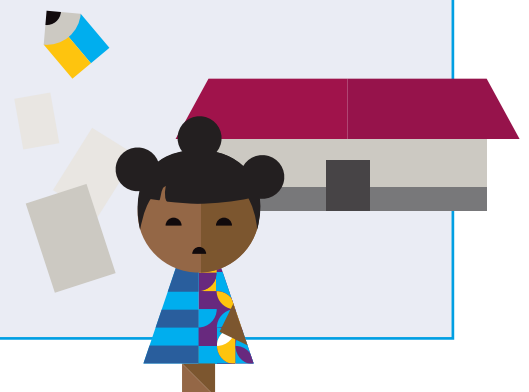
Conclusion and recommendations

Findings from the EGRA show that students in Grades 3–4 in Mozambique have experienced learning loss. Specifically, students identified fewer letters after the school closures. For example, in 2021, Grade 3 students could identify around seven letters less than Grade 3 students in 2019. Similarly, Grade 4 students were able to identify six letters less than in 2019.

Findings from the EGRA assessment suggest that household wealth and school resources are the factors that are most associated with letter name identification and reading scores, after controlling for variables influencing educational outcomes. For familiar word reading, the most associated variables are wealth, death in the family, and school-related factors (being equipped with toilets and lighting, supervision visits and having more full-time teachers). There was no clear evidence of changes in scores for the familiar word reading subtask, but the scores were very low and did not differ between pre- and post-pandemic school closures.

Given that learning loss due to school closures is a global problem, every country must find relevant and effective solutions for their children's needs. In Mozambique, it will be critical for education stakeholders to work towards improving educational outcomes through evidence-based interventions. Based on the results of this research, recommendations for policymakers are listed below.

- Adopt a multi-strategy approach: Employing a combination of customized strategies, such as teacher training, quality school management, improvements to school infrastructure, extended school hours, and additional tutoring, can help mitigate the impact of learning loss. These strategies must be rooted in thoughtful and evidence-based research. For instance, it is important to recognize that face-to-face training and follow-up sessions can significantly enhance the effectiveness of teacher training programmes (Popova et al., 2022). Additionally, the pandemic revealed the importance of strengthening remote learning systems for learning with low-tech tools for equitable learning (Pontuschka et al., 2022).
- Deliver more targeted pedagogy: Evaluating the current early literacy and numeracy programmes offered by MINEDH and other partners can facilitate the development of more customized activities to improve student learning outcomes. Targeted pedagogy can be delivered by tailoring teaching methods and materials to the specific learning needs and abilities of individual students.
- Strengthen research to identify key drivers of learning: Conducting future EGRA assessments on a larger sample of ALDE survey participants could help establish causal relationships between student, household and school characteristics and early literacy. This could facilitate the development of tailored interventions that address the specific challenges and needs of Mozambique's primary school students.



References

- Brady, S., Beginning to Read: Thinking and Learning about Print, *Language and Speech*, vol. 34, no. 2, 1991. DOI: 10.1177/002383099103400205
- Dubeck, M. M. and Gove, A., The Early Grade Reading Assessment (EGRA): Its Theoretical Foundation, Purpose, and Limitations, *International Journal of Educational Development*, vol. 40, January 2015, pp. 315–22. DOI: 10.1016/j.ijedudev.2014.11.004
- Ehri, L. C. and Wilce, L. S., Movement into Reading: Is the First Stage of Printed Word Learning Visual or Phonetic?, *Reading Research Quarterly*, vol. 20, no. 2, 1985. DOI: 10.2307/747753
- Moscoviz, L., and Evans, D. K., Learning Loss and Student Dropouts during the Covid-19 Pandemic: A Review of the Evidence Two Years after Schools Shut Down, 609, 2022.
- Popova, A., Evans, D. K., Breeding, M. E. and Arancibia, V., Teacher Professional Development around the World: The Gap between Evidence and Practice, *World Bank Research Observer*, vol. 37, no. 1, 2022. DOI: 10.1093/wbro/lkab006
- Pontuschka, R., Kan, S. and Dreesen, T. Reopening with Resilience: Lessons from Remote Learning during COVID-19 in Eastern and Southern Africa. UNICEF Office of Research-Innocenti. 2022.
- Raupp, M., Newman, B., Revés, L., Lauchande, C., Allan, E. J., and Jordan, M. A., Impact Evaluation of the USAID/ Aprender A Ler Project in Mozambique Year 3 IE/RCT Final Report, May 23, 2016.
- RTI International, Status of Early Grade Reading in Sub-Saharan Africa, Washington, DC, 2015.
- UNICEF, Universidade Pedagógica de Maputo, and Ministério da Educação e Desenvolvimento Humano de Moçambique, Drivers of Primary School Dropout in Mozambique: Longitudinal Assessment of School Dropout in 2019, Florence, 67, 2022.
- United Nations, Mozambique School Children Face 'Catastrophic' Fall-out from COVID-19: A UN Resident Coordinator Blog, 2020.



Annex

Table 1: Dependent variable: Letters subtask (score)

	1 tobit	2 tobit	3 tobit	4 tobit	5 tobit	6 tobit	7 tobit	8 OLS
Year (ref. 2019)	17.37*** (1.001)	17.30*** (1.061)	16.74*** (1.047)	8.994*** (1.205)	-8.505*** (1.446)	-9.602*** (1.885)	-24.19*** (3.639)	-22.17*** (3.247)
Individual level								
Female		-0.537 (1.124)	-0.728 (1.095)	-0.148 (1.183)	-0.0719 (1.090)	-0.0345 (1.089)	0.315 (1.062)	0.779 (0.803)
Malaria and disease		-5.980*** (1.039)	-4.587*** (1.022)	-1.693 (1.123)	-0.309 (1.038)	-0.345 (1.040)	-0.852 (1.031)	-0.974 (0.783)
Meals eaten (#)		3.282*** (0.945)	0.920 (0.930)	-0.443 (0.982)	0.436 (0.917)	0.404 (0.918)	0.373 (0.908)	0.442 (0.671)
Initiation		0.912 (1.634)	0.953 (1.633)	3.296* (1.718)	4.158** (1.775)	4.224** (1.779)	5.401*** (1.756)	3.772*** (1.355)
Initiation*Female		0.320 (4.019)	2.501 (4.076)	0.00675 (4.110)	-6.331 (3.966)	-6.523 (3.972)	-6.411 (3.905)	-4.797 (3.076)
Attendance		13.29*** (3.022)	9.900*** (3.127)	6.421* (3.282)	4.423 (3.130)	4.339 (3.128)	3.866 (3.032)	1.590 (1.937)
Dropout		49.72*** (18.45)	39.11** (17.20)	15.03*** (2.587)	21.54*** (3.480)	21.69*** (3.493)	19.54*** (3.454)	14.76*** (2.622)
Household level								
TV			13.49*** (1.185)	9.425*** (1.514)	7.003*** (1.402)	6.951*** (1.404)	8.607*** (1.397)	6.093*** (1.101)
Room (for child)			1.230 (1.170)	2.566** (1.252)	2.765** (1.251)	2.770** (1.251)	1.734 (1.230)	1.134 (0.978)
Bike			-3.317*** (1.148)	-2.488* (1.272)	-2.323* (1.221)	-2.312* (1.221)	-2.450** (1.200)	-1.192 (0.896)
Death of an income earner			3.299 (3.542)	3.339 (3.804)	1.113 (3.473)	1.081 (3.489)	1.160 (3.388)	2.040 (2.518)
No. of school-age household members			0.505 (0.377)	0.730* (0.416)	0.849** (0.387)	0.855** (0.387)	0.792** (0.382)	0.534* (0.300)
Latrine or toilet			2.143* (1.257)	1.429 (1.275)	1.562 (1.286)	1.561 (1.286)	1.381 (1.266)	1.608* (0.937)
School level								
Class size				-0.199*** (0.0364)	-0.0612* (0.0314)	-0.0624** (0.0314)	-0.0407 (0.0308)	-0.0220 (0.0234)
Female teacher				-1.370 (1.191)	1.428 (1.133)	1.420 (1.134)	0.589 (1.139)	0.231 (0.860)
Teacher's years of experience				-0.124* (0.0699)	0.00219 (0.0692)	0.000274 (0.0690)	-0.0125 (0.0671)	-0.0363 (0.0482)
Latrine or toilet				0.0220 (1.181)	-0.0195 (1.252)	-0.0348 (1.252)	0.918 (1.232)	0.623 (0.912)
Lighting				2.381 (1.660)	5.825*** (1.940)	5.984*** (1.959)	4.963** (1.931)	4.150*** (1.569)
Supervision visits of 4 or more instances				0.267 (1.288)	-0.575 (1.312)	-0.697 (1.319)	-0.119 (1.324)	-1.121 (0.993)
Population				-0.000643*** (0.000238)	-0.000458** (0.000223)	-0.000479** (0.000225)	-0.000561** (0.000249)	-0.000567*** (0.000175)
Full-time teachers (#)				0.185*** (0.0529)	0.110** (0.0467)	0.113** (0.0469)	0.230*** (0.0512)	0.200*** (0.0382)
Mixed school				-10.86*** (2.486)	-3.811* (2.267)	-3.689 (2.266)	-3.082 (2.206)	0.346 (1.375)
Province fixed effects					YES	YES	YES	YES

Age-fixed effects (6-15 years)					YES	YES	YES	
Grade-level dummies (1-6)						YES	YES	
Year*Grade*Rural interaction						YES	YES	
Rural							10.84** (4.947)	6.865*** (1.824)
Constant	3.568*** (0.670)	-12.54*** (3.603)	-10.90*** (3.800)	7.090 (5.010)	-32.67*** (6.495)	-32.44*** (6.487)	-40.71*** (7.674)	-14.62*** (4.481)
sigma								
Constant	29.90*** (0.448)	29.26*** (0.455)	28.44*** (0.457)	26.33*** (0.565)	23.46*** (0.536)	23.45*** (0.536)	22.91*** (0.532)	
Observations	4130	3503	3489	2693	2641	2641	2640	2640
R2								0.303
Adjusted R2								0.288

Standard errors in parentheses

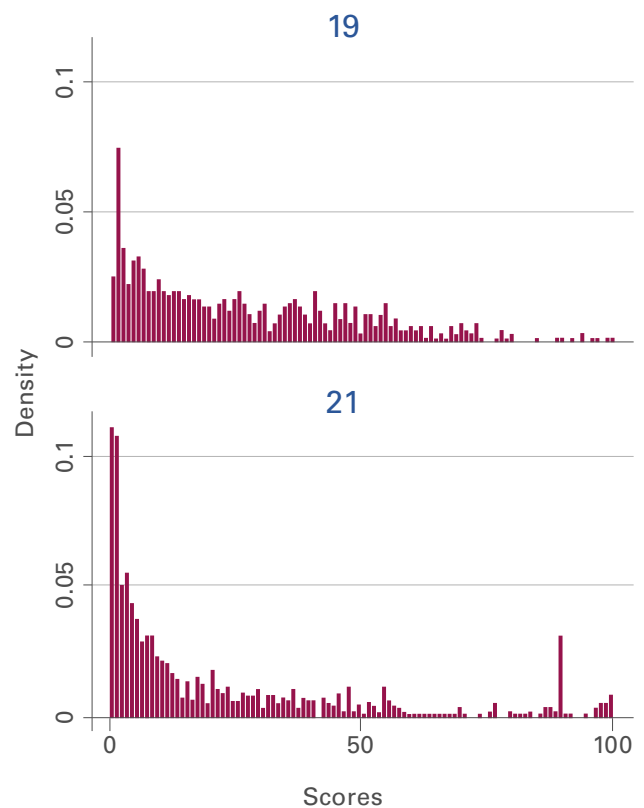
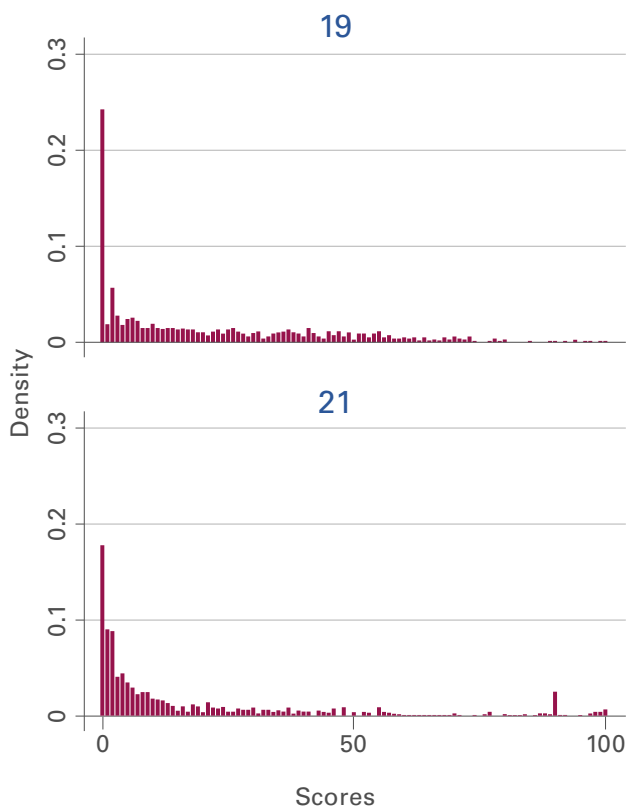
* p < .10, ** p < 0.05, *** p < 0.01

Table 2: Distribution of EGRA scores, by familiar letters and familiar words subtasks

Familiar letters: distribution of scores

Including zero scores

Excluding zero scores



Familiar words: distribution of scores

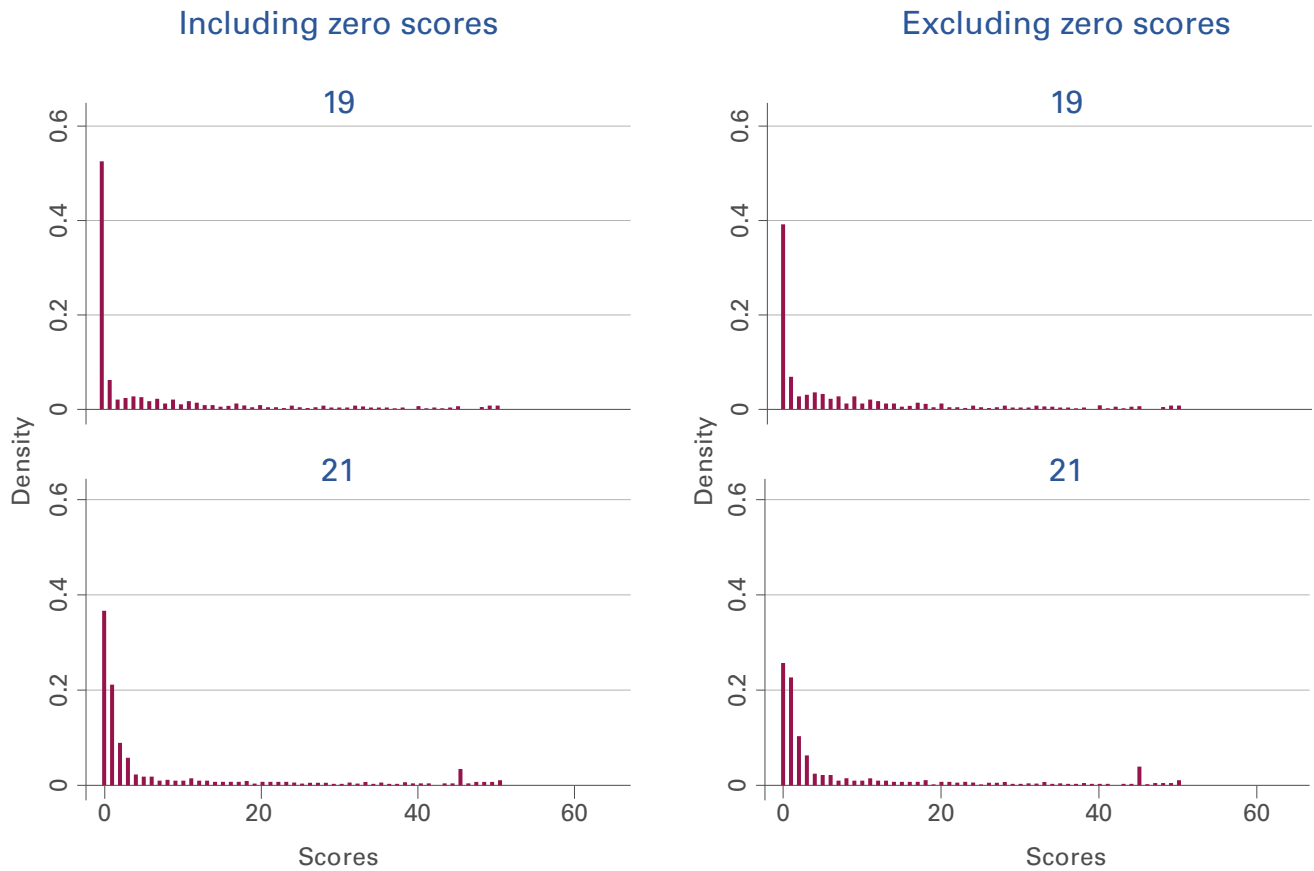


Table 3: Dependent variable: Word subtask (score)

	1 tobit	2 tobit	3 tobit	4 tobit	5 tobit	6 tobit	7 tobit	8 OLS
Year (ref. 2019)	14.89*** (0.748)	14.73*** (0.781)	14.55*** (0.778)	9.707*** (0.916)	0.130 (1.084)	-0.707 (1.381)	-14.83*** (0.296)	-9.984*** (1.885)
Individual level								
Female		-0.858 (0.793)	-0.973 (0.772)	-1.145 (0.864)	-0.406 (0.805)	-0.374 (0.807)	-0.000564 (0.216)	0.209 (0.403)
Malaria and disease		-4.088*** (0.750)	-3.081*** (0.738)	-1.223 (0.815)	0.259 (0.768)	0.229 (0.768)	-0.265 (0.211)	-0.0950 (0.377)
Meals eaten (#)		2.753*** (0.670)	1.146* (0.665)	0.0786 (0.712)	0.272 (0.667)	0.246 (0.668)	0.200* (0.116)	-0.0465 (0.323)
Initiation		-3.743*** (1.161)	-3.644*** (1.174)	-2.141* (1.245)	1.053 (1.308)	1.116 (1.315)	2.180*** (0.249)	0.313 (0.631)
Initiation*Female		0.848 (2.719)	2.218 (2.732)	0.652 (2.609)	-3.209 (2.625)	-3.379 (2.632)	-3.069*** (0.336)	-1.858 (1.305)
Attendance		9.432*** (2.291)	6.719*** (2.316)	4.524* (2.390)	2.399 (2.281)	2.327 (2.285)	1.626*** (0.293)	0.478 (0.707)
Dropout		30.09 (20.70)	22.98 (19.65)	-95.47 (.)	-72.07 (.)	-71.91 (.)	-71.14 (.)	-0.598 (1.243)

Household level								
TV	9.176*** (0.832)	6.663*** (1.127)	4.469*** (1.036)	4.426*** (1.035)	5.809*** (0.276)	2.715*** (0.572)		
Room (for child)	0.0401 (0.833)	1.384 (0.904)	2.680*** (0.911)	2.679*** (0.909)	1.752*** (0.208)	0.696 (0.489)		
Bike	-2.428*** (0.823)	-1.883** (0.938)	-1.752* (0.924)	-1.750* (0.924)	-1.796*** (0.203)	-0.00758 (0.433)		
Death of an income earner	2.044 (2.318)	2.033 (2.655)	-0.713 (2.492)	-0.740 (2.511)	-0.606*** (0.201)	0.487 (1.135)		
No. of school-age household members	-0.240 (0.268)	-0.0261 (0.301)	0.0644 (0.276)	0.0714 (0.276)	0.0276 (0.0742)	0.0835 (0.143)		
Latrine or toilet	0.749 (0.889)	0.322 (0.923)	0.614 (0.961)	0.612 (0.962)	0.347 (0.267)	0.827* (0.444)		
School level								
Class size		-0.160*** (0.0291)	-0.0415* (0.0238)	-0.0425* (0.0238)	-0.0180*** (0.00431)	-0.000664 (0.0113)		
Female teacher		-1.482* (0.869)	-0.0669 (0.860)	-0.0677 (0.860)	-1.141*** (0.240)	-0.156 (0.404)		
Teacher's years of experience		-0.125** (0.0545)	-0.000169 (0.0555)	-0.00212 (0.0553)	-0.00239 (0.0158)	-0.00907 (0.0234)		
Latrine or toilet		-0.905 (0.877)	0.365 (0.930)	0.368 (0.928)	1.539*** (0.237)	0.662 (0.457)		
Lighting		1.820 (1.275)	2.016 (1.447)	2.145 (1.458)	1.662*** (0.321)	1.749** (0.810)		
Supervision visits of 4 or more instances		0.206 (1.017)	0.335 (1.014)	0.237 (1.019)	0.773*** (0.217)	0.168 (0.501)		
Population		-0.000298* (0.000174)	-0.0000959 (0.000167)	-0.000114 (0.000169)	-0.000230*** (0.0000429)	-0.000225*** (0.0000811)		
Full-time teachers (#)		0.122*** (0.0395)	0.110*** (0.0380)	0.113*** (0.0381)	0.226*** (0.00869)	0.118*** (0.0207)		
Mixed school		-9.303*** (1.924)	-3.989** (1.888)	-3.839** (1.886)	-2.864*** (0.266)	0.206 (0.617)		
Province fixed effects			YES	YES	YES	YES		
Age-fixed effects (6-15 years)				YES	YES	YES		
Grade-level dummies (1-6)					YES	YES		
Year*Grade*Rural interaction					YES	YES		
Rural					80.45*** (0.280)	3.872*** (0.896)		
Constant	-10.30*** (0.581)	-22.23*** (2.753)	-18.36*** (2.850)	-3.304 (3.860)	-38.90*** (5.432)	-38.69*** (5.422)	-114.7*** (0.299)	-9.266*** (2.137)
sigma								
Constant		19.62*** (0.372)	19.11*** (0.382)	18.52*** (0.370)	17.26*** (0.468)	15.22*** (0.422)	15.21*** (0.421)	14.55*** (0.0621)
Observations	4130	3503	3489	2693	2641	2641	2640	2640
R2								0.306
Adjusted R2								0.291

Standard errors in parentheses

* p < .10, ** p < 0.05, *** p < 0.01

Table 4. List of control variables included in the regression analysis.

Level of analysis	Variable	Definition	Measure
Individual	Gender	Being female vs. male.	Binary
	Disease	Whether the child had malaria, dengue or yellow fever during the previous year.	Binary
	Initiation	Whether a girl has undergone initiation rites.	Binary
	Attendance	School attendance was confirmed by checking attendance records and by observation in school by enumerators.	Binary
	Room	Whether the child has a room for themselves at home.	Binary
Household	Food	The number of meals that the household ate a day before the household survey.	Continuous
	Latrine	Whether the household has a designated place to defecate (including indoor flushed toilet, outdoor flushed toilet, unflushed toilet, improved latrine, enhanced traditional latrine, unimproved latrine) as opposed to having no toilet or latrine.	Binary
	Television	Whether the household owns a television.	Binary
	Income shock	Whether the household has had an income shock due to the death of an income-providing household member.	Binary
	Size	The number of school-age household members.	Continuous
School	Size	Number of students in a class or school.	Continuous
	Teacher characteristics	Both the gender of the teacher and the years of teaching experience were included in the analysis.	Binary / Continuous
	Infrastructure	Factors such as whether the school has a bathroom, lighting, the number of full-time teachers, and whether the school has mixed grades were included in the analysis.	Binary
	Supervision visits	Whether the school was inspected more than four times in the current year.	Binary
Geography	Rural	Whether the school is in an urban or rural area.	Binary
	Province	In which of the 11 provinces the student is located.	Categorical

Acknowledgements

This brief was authored by Sophia Kan (UNICEF Innocenti – Global Office of Research and Foresight). The author prepared this report under the supervision and guidance of Matt Brossard and Thomas Dreesen (UNICEF Innocenti).

Additional support and guidance were provided throughout the research process by Rafael Pontuschka (UNICEF Innocenti) and UNICEF Mozambique including: Celine Sorboe, Helder Nombora, Kenji Ohira and Stephanie von Wogau.

A special thank-you goes to the following experts who provided valuable input and comments: Andre Loureiro and Trymore Mafucha Dhliwayo.

Amparo Barrera provided invaluable administrative support to the team. Thanks also go to Céline Little, Sarah Marchant and Sabrina Tiffany Giffen Desuasido Gill for their support with the production and communication of this research.



UNICEF works in the world's toughest places to reach the most disadvantaged children and adolescents and to protect the rights of every child, everywhere. Across 190 countries and territories, we do whatever it takes to help children survive, thrive and fulfill their potential, from early childhood through adolescence. And we never give up.

UNICEF Innocenti – Global Office of Research and Foresight tackles the current and emerging questions of greatest importance for children. It drives change through research and foresight on a wide range of child rights issues, sparking global discourse and actively engaging young people in its work.

UNICEF Innocenti equips thought leaders and decision-makers with the evidence they need to build a better, safer world for children. The office undertakes research on unresolved and emerging issues, using primary and secondary data that represent the voices of children and families themselves. It uses foresight to set the agenda for children, including horizon scanning, trends analysis and scenario development.

The office produces a diverse and dynamic library of high-level reports, analyses and policy papers, and provides a platform for debate and advocacy on a wide range of child rights issues.

UNICEF Innocenti provides, for every child, answers to their most pressing concerns.

This brief was written by Sophia Kan and Rafael Pontuschka (UNICEF Innocenti – Global Office of Research and Foresight).

Suggested citation: Kan, Sophia; Pontuschka, Rafael. 'Learning on Hold: The Toll of COVID-19 School Closures on Mozambique's Foundational Literacy', UNICEF Innocenti – Global Office of Research and Foresight, Florence, June 2023.

UNICEF Innocenti - Global Office of Research and Foresight

Via degli Alfani, 58

50121 Florence, Italy

Tel: (+39) 055 20 330

researchpublications@unicef.org

www.unicef-irc.org

@UNICEFInnocenti on Twitter, LinkedIn, Facebook, Instagram and YouTube

© 2023 United Nations Children's Fund (UNICEF)



unicef 
for every child