



Rewrite the future: How Indonesia's education system can overcome the losses from the COVID-19 pandemic and raise learning outcomes for all

September 2021: Rythia Afkar and Noah Yarrow

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This report was prepared by: Rythia Afkar, Noah Yarrow

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Contact Information

The authors can be contacted at rafkar@worldbank.org, nyarrow@worldbank.org

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Abbreviations

DKI	Capital Special region (<i>Daerah Khusus Ibukota</i>)
EAP	East Asia Pacific
EMIS	Education Management Information System
GDP	Gross Domestic Product
GoI	Government of Indonesia
HCI	Human Capital Index
HiFy	High Frequency
IDR	Indonesian Rupiah
LAYS	Learning Adjusted Years of Schooling
MoECRT	Ministry of Education, Culture, Research, and Technology (<i>Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi</i>)
MoH	Ministry of Health (<i>Kementerian Kesehatan</i>)
MoHA	Ministry of Home Affairs (<i>Kementerian Dalam Negeri</i>)
MoRA	Ministry of Religious Affairs (<i>Kementerian Agama</i>)
NGO	Non-governmental Organization
OECD	Organisation for Economic Co-operation and Development
OOSC	Out-of-school Children
PIP	Indonesia Education Grant Programme (<i>Program Indonesia Pintar</i>)
PISA	Programme for International Student Assessment
PPP	Purchasing Power Parity
TIMSS	Trends in International Mathematics and Science Study
UNICEF	United Nations Children's Fund
WASH	Water, Sanitation, and Hygiene



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Overview

We present an updated estimate of learning loss due to COVID-19-related school closures in Indonesia, taking into account the Government of Indonesia's mitigating measures. **Our revised estimates show that school closures precipitated by the COVID-19 pandemic could result in a total loss of between 0.9 and 1.2 years of learning adjusted schooling and on average between 25 and 35 points on student's PISA reading scores.** The extent of learning loss is determined more by the effectiveness of distance learning than it is by the duration of school closure in the time period investigated. We identify a reduction of between US\$408 and US\$578 per student in future annual earnings equivalent to a present value loss in lifetime earnings for all students of between US\$253 and 359 billion, or 24 to 34 percent of 2020 GDP. To accelerate learning and to recover some of these losses in the short-term, schools and teachers can assess what each of their students has been able to learn while schools were closed and use differentiated plans to support each child to accelerate their learning. In the longer term, the Government can support the increased resilience of education service delivery to protect against future shocks from pandemics, climate change and other threats. The objective for Indonesia should be an overall improvement of student learning outcomes over pre-pandemic performance, together with increased education system resilience.

1

Introduction

1.1 School Closures and an Evolving Policy Response

As a result of the COVID-19 pandemic and resulting school closures, most of Indonesia's 68 million primary and secondary students have been away from their classrooms since March 2020. The Ministry of Education, Culture, Research and Technology (MoECRT) and the Ministry of Religious Affairs (MoRA) have provided distance education mechanisms, such as online learning and educational television, to mitigate the effects of school closure, with significant variation in access and uptake across students and families. Distance learning arrangements have left some students behind, especially those who have limited access to the internet and digital devices, and those from lower socioeconomic backgrounds, according to the World Bank's nationally representative *High Frequency Monitoring of COVID-19 Impacts for Indonesia (HiFy)*.¹ We expect students with disabilities to have greater needs if they are to continue learning throughout school closures, and they are therefore at higher risk of learning loss. Significantly, the shift to learning from home has required new skills and approaches from students, teachers and families. Some have done this more successfully than others.

The Government of Indonesia (GoI) has implemented a series of policy approaches adapted to the changing circumstances and needs during the COVID-19 pandemic. The GoI policy response evolved from an initial centralized order to close all schools² to a more flexible approach that provides for some decentralized decision-making. In June 2020, four ministries (MoECRT, MoRA, the Ministry of Health - MoH and the Ministry of Home Affairs - MoHA) launched a Regulation on Learning Activities during the Pandemic that allows districts in 'green zones'³ to reopen schools and conduct face-to-face learning after obtaining permission from the local government through provincial or district/city education offices following approval from the local COVID-19 task force.⁴ Schools in 'yellow zone' districts with low infection rates are also allowed to conduct face-to-face learning as of August 2020.⁵ This risk-zoning map policy was replaced by permits from local government/regional offices/MoRA offices, and education units and parents in November 2020.⁶ The most recent policy was announced in March 2021, allowing schools that have completed the vaccination of all teachers⁷ to offer face-to-face learning, while allowing parents to opt for students to continue studying from home through distance-learning modes.⁸

¹ *High Frequency (HiFy) survey is nationally representative household survey focuses on about 4,000 households across 40 districts and 35 cities in 27 provinces in Indonesia conducted by the World Bank to generate usable and near real-time insights on the impact of the COVID-19 pandemic.*

² MoEC Circular Letter No. 4/2020 on Implementation of Education Activities in the COVID-19 Emergency Period, which closed all schools and suspended exams on March 24, 2020.

³ The National COVID-19 Task Force had mapped the risk status of all regions in the country affected by the COVID-19 pandemic based on 15 indicators from the World Health Organization. The indicators, which comprise the number of new cases, suspects and fatalities, among other things, determine whether the regions fall into the green, yellow, orange or red category, with green zone labelled as those areas with lowest risk of infection.

⁴ Joint Regulation MoEC – MoRA – MoH – MoHA No. 01/KB/2020, 516, HK.03.01/MenKes/363/2020, 440-882.

⁵ Joint Regulation MoEC – MoRA – MoH – MoHA No. 03/KB/2020, 612, HK.01.08/MenKes/502/3030, 119-4536.

⁶ Joint Regulation MoEC – MoRA – MoH – MoHA No. 04/KB/2020, 737, HK.01.08/MenKes/7093/2020, 420-3987.

⁷ In February 2021, the Government included teachers as a priority target for the COVID-19 vaccination program. The national vaccination program for teachers is expected to be completed by June 2021.

⁸ Joint Regulation MoEC – MoRA – MoH – MoHA No. 03/KB/2021, 384, HK.01.08/MenKes/4242/2021, 440-717.



The number of schools conducting face-to-face learning activities varies over time and location.

In November 2020, MoECRT estimated around 10-15 percent of schools had reopened nationally, up from essentially zero in June 2020. The highest proportion of face-to-face schools at the end of 2020 were in districts located in eastern Indonesia (Papua, Maluku, Nusa Tenggara), with some in Sumatra and Sulawesi. In February 2021, the national figure for reopened schools began to slowly increase. With the teacher vaccination program, schools were expected to reopen in July 2021 at the beginning of academic year 2021/2022. However teacher vaccination rates have just reached 39 percent as of end of July 2021.⁹ With the alarming surge of COVID-19 cases, the government imposed vast emergency health and mobility restrictions which came into effect from July 3. This new policy includes mandatory full online learning for schools in affected regions especially in Java and Bali.

While the GoI has made timely efforts to support learning during the period of school closure, including an emergency curriculum, educational TV, and internet credits to increase student access, school closures have resulted in a deeper

learning crisis than in pre-COVID-19 times.

Before the pandemic, the Indonesian education system delivered learning at levels far below what the children and youth of Indonesia need today, with only 30 percent of children achieving minimum scores in reading on the Programme for International Student Assessment (PISA).¹⁰ *Learning poverty*, namely the proportion of children who are unable to read and understand a short, age-appropriate text by age ten, was estimated at 53 percent in 2021.¹¹ Indonesian students attend school for 12.4 years on average, but they only learn the equivalent of 7.8 years (Human Capital Index 2020). School closures during the pandemic have brought greater challenges to the system, from unequal access to distance learning, variation in teacher familiarity and capability in distance education technology, and variation in parents' ability to engage with their children's learning, among other challenges. Everyone lost something due to the pandemic and some students, especially those in lower-income households and in rural areas, lost more than others. As we look toward mitigating the effects of the pandemic on education, it is essential to investigate the magnitude of its effects on learning outcomes.

⁹ MOEC's presentation 'Data Penyelenggaraan Pendidikan di Masa Pandemi COVID-19', July 26, 2021.

¹⁰ OECD. 2019. PISA Results from PISA 2018, Country Note: Indonesia, OECD. https://www.oecd.org/pisa/publications/PISA2018_CN_IDN.pdf

¹¹ Indonesia Learning Poverty Country Brief World Bank 2021 (<https://documents1.worldbank.org/curated/en/579771624553117186/pdf/Indonesia-Learning-Poverty-Brief.pdf>).

2

Updated Estimation

Our previous analysis considered the effects of different periods of school closure for up to eight months.¹² The overall effectiveness of alternative modalities to mitigate the effect of school closures was assumed to be only 33 percent, or four percentage points lower than the current estimate of 37 percent. We estimated that the Government's supply of distance education covers 96 percent of the population, while access to distance education by students using the internet or television is estimated to be 86 percent. In the revised estimate presented here, we utilize actual data of student access to distance education through the nationally representative High Frequency survey which found that 93 percent of students continued to engage in distance learning activities from home.¹³ We also use the dynamic partial school closure situation today, following Courtier et al. (2021).¹⁴ No nationally representative direct measures of learning loss have yet been published.

2.1 Revised Tool and Parameters

To estimate the impact of COVID-19-related school closures on student learning, the World Bank developed a simulation tool. Using data from the Human Capital Index, harmonized household survey data from the Global Monitoring Database, and the World Economic Outlook of the International Monetary Fund (Azevedo et al. 2020), this tool has been updated to reflect learning situations on the ground, including the duration of the actual and projected school closures, by incorporating fully closed and partly closed situations. The earlier tool version was used to produce an estimate in October 2020, while this new estimate uses the revised tool along with Indonesia-specific data to further specify estimation parameters.

The key parameters in the simulation consist of three elements: Government supply (or expected

coverage) of alternative education modalities (G), the ability of households to access (or take up) these alternative modalities (A), and the effectiveness of these alternative modalities (E).¹⁵ Data on the government's supply of, and household access to, distance learning has been updated following the previous estimation (see Section 3 below) using the most recent results from the High Frequency (HiFy) household survey. This nationally representative HiFy household survey focuses on about 4,000 households across 40 districts and 35 cities in 27 provinces in Indonesia. It was conducted by the World Bank to generate usable and near real-time insights on the impact of the COVID-19 pandemic, to inform the Gol's policy responses to the crisis in multiple sectors, including education. Results from the HiFy surveys showed that, while 93 percent of students participated in distance learning, they did so with varying levels of frequency and duration.¹⁶

¹² Yarrow, Masood, and Afkar. 2020. Estimates of COVID-19 Impacts on Learning and Earning in Indonesia: How to Turn the Tide. World Bank, Washington, DC.

¹³ Purnamasari, R. and Ali, R. 2021. Indonesia COVID-19 Observatory: Education Services During the COVID-19 Pandemic - November to December 2020. World Bank, Washington, DC.

¹⁴ Marie-Helene Cloutier, Joao Pedro Azevedo, Diana Goldemberg. 2020. "EAP country tool for simulating the potential impacts of COVID-19 school closures on schooling and learning outcomes". World Bank, Washington, DC.

¹⁵ Joao Pedro Azevedo, Koen Geven, Diana Goldemberg, Amer Hasan, Syedah Aroob Iqbal. 2020. "Country Tool for Simulating COVID-19 Impacts on Learning and Schooling Outcomes." World Bank, Washington, DC.

¹⁶ The question asked to all households who have children aged 5-18 years old who are currently enrolled in school: "Did [student] participate in distance learning last week?" The average number of hours spent daily on distance learning activities varied widely, from nearly 3.5 hours per day in DKI Jakarta to 2.3 and 2.2 hours elsewhere on Java and outside Java, respectively. Primary school students, those in rural areas, and those in the bottom 40 percent spent on average less time daily on distance learning than others. <https://www.worldbank.org/en/country/indonesia/brief/indonesia-covid-19-observatory>

Estimates show that school closures precipitated by the COVID-19 pandemic through June 2021 have already resulted in a loss of approximately 0.9 years of learning adjusted schooling and 25 points on student's PISA reading scores.

The proportion of students who participated in distance learning is used to understand both the Government supply of distance learning (G) and the ability of households to access it (A). In our model, the effectiveness of alternative modalities (E) ranges from zero if the distance learning solutions are expected to have no effect on student learning, to one if those solutions are expected to be fully effective (meaning they are equivalent to face-to-face instruction). The (E) effectiveness of alternative modalities which are predominantly distance learning through online learning and educational television, but including some small group instruction by teachers, especially in remote areas is estimated at 40 percent.¹⁷ This means that students accessing alternative modalities are likely to learn slightly less than half of what they would in their classrooms. These three elements, G, A, and E, together make up the overall mitigation effectiveness of alternate modalities ($m = (G \times A \times E)$). In the case of Indonesia, assuming $G \times A = 93$ percent and $E = 40$ percent, therefore **mitigation effectiveness (m) = 37 percent**.

To see how the results would be different in the context of the different time periods and different levels of effectiveness of alternative learning modalities, we analyze two sets of estimations with three scenarios each:

(i)

Retrospective learning loss based on observed school closure in the period of January 2020 – June 2021. In this estimation, there are three scenarios: 'Optimistic scenario' with effectiveness of alternative modalities (E) assumed to be 40 percent, 'Intermediate scenario' and 'Pessimistic scenario' with E is set to be lower at 20 percent and 10 percent respectively.



(ii)

Prospective learning loss based on the scenarios of future school closure between July – December 2021. Starting in the new academic year in July 2021, we establish three scenarios. The 'optimistic' scenario assumes that the teacher vaccination program progresses well, such that all schools can reopen for face-to-face learning. We establish an 'intermediate' scenario for the estimation tool, which assumes that the teacher vaccination program takes longer than expected and, as a result, only 50 percent of schools reopen for face-to-face learning in July 2021. Our 'pessimistic' scenario assumes that, in addition to the slow progress of the teacher vaccination program, COVID-19 cases surge again in the country, requiring all schools to be fully closed. It is our genuine hope and expectation that this pessimistic scenario can be avoided, but when looking at the current difficulties, we believe it is worthwhile to consider the implications.

The results of these two scenarios are presented below.

¹⁷ Azevedo et al. 2020 presents an estimate for effectiveness which is an approximation rather than empirically derived figure. Please see Yarrow et al. 2020 for further discussion.

2.2 Updated Impacts on Learning and Earning

Our analysis estimates how much learning has been already been lost and may be lost in a system where student learning levels were already low before the pandemic hit. Learning adjusted years of schooling (LAYS) account for the difference between the number of years a child attends school and the actual years of learning the child has completed according to harmonized test scores. In Indonesia, according to the HCI (Human Capital Index) 2020, a child could expect to complete 12.4 years of schooling but only 7.8 years of learning, with the benchmark being set at the value for top performance (a TIMSS score of 625, which corresponds to the TIMSS “advanced” international benchmark).¹⁸ The PISA scores are a measure of 15-year-olds’ learning levels for reading, math and science. In the latest round of PISA, for example, Indonesia continued to lag behind the OECD and East Asia Pacific averages, with a reading score of only 371 compared to 472 for participating countries in the East Asia Pacific region.

i. Retrospective learning loss from January 2020 – June 2021

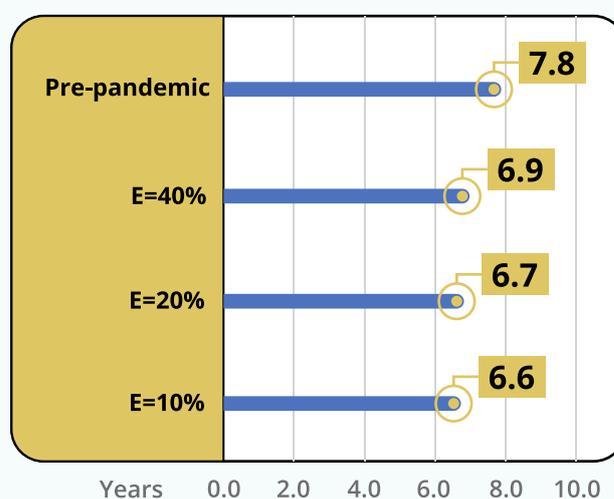
The retrospective learning loss calculation based on the observed school closures from January 2020 to June 2021 is estimated to be 0.9 year of LAYS and 25 points of PISA reading score. Assuming the alternative teaching and learning modalities are 40 percent as effective as face-to-face instruction, we estimate the LAYS has declined from 7.8 to 6.9 years. The PISA reading score has decreased from 371 to 346, according to our model. This new level is lower than the average score of socially disadvantaged students, the bottom 20 percent, in PISA 2018 (349 points).

Within the same January 2020 to June 2021 timeframe, we can examine the effect of varying the quality of alternative teaching and learning modalities. If we lower the effectiveness to 20 and 10 percent, the

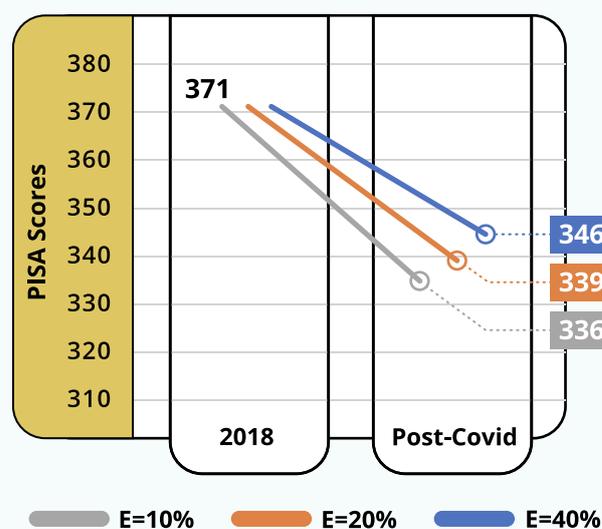
magnitude of the total retrospective learning loss is between 1.1 and 1.2 LAYS, respectively. The PISA reading scores also fall to 339 and 336, respectively.

Figure 2.1 Estimated learning loss based on the observed period of school closure January 2020 – June 2021

a. LAYS



b. PISA Scores



¹⁸ Kraay, A. 2019. The World Bank Human Capital Index: A Guide (2019) https://openknowledge.worldbank.org/bitstream/handle/10986/34343/wbro_34_1_1.pdf?sequence=1&isAllowed=y



This retrospective learning loss can be quantified in terms of labor market returns, since human capital and future earnings are correlated.

Education can make workers more productive by giving them the skills that allow them to increase their output.¹⁹ Our estimates show that the average student will face a reduction of US\$408, US\$520, and US\$575 in yearly earning once s/he enters the labor market under the optimistic (E=40 percent), intermediate (E=20 percent), and pessimistic (E=10 percent) scenarios through June 2021, respectively. Using 2017 US dollar purchasing power parity (PPP) in Indonesia, this would lead to a present value loss in lifetime earnings for all students of about US\$253 billion under the optimistic scenario, equivalent to 24 percent of 2020 GDP.²⁰

The COVID-19 pandemic and the subsequent economic crisis have consequences on household resources allocated for education which may increase student dropout rates. Before the pandemic, enrolling a student in Indonesia was costly: out-of-pocket costs (including transportation) ranged from around IDR 1 million to over IDR 3 million (US\$77 to US\$230), depending on school level.²¹ After the pandemic started, households reduced on average 30 percent and 40 percent of their usual pre-pandemic monthly food and non-food consumption respectively, which can affect education expenditure and household decisions to keep their children in school.

The prevalence of dropping out is higher for male than female students. The HiFy survey analysis found about two percent of children aged 5 – 18 years who had been enrolled in school up to March

2020 (just before pandemic started in Indonesia) were no longer enrolled in November 2020.²² The male student dropout prevalence is about 2.5 percent, while the female dropout rate is 1.3 percent. This trend is similar with out-of-school rates before the pandemic (Afkar, et al., 2020).²³ Twenty-seven percent of students who had dropped out after the pandemic reported that they were delaying further schooling temporarily. Male students who dropped out reported that 'delay for further schooling temporarily' (34 percent) and 'did not want to continue' (31 percent) as the major reason for dropping out. Seventy-four percent of female students reported 'lack of financial resources to pay tuition fees' as the reason for dropping out, while only ten percent of male students stated this reason.

Table 2.1 Reasons for dropping out of school after the pandemic by gender (percentage)

Reasons	Male	Female
Lack of money to pay for tuition fees	9.9	73.6
Delayed further schooling temporarily	34.1	10.5
Did not want to continue	31.0	0.0
No need for further schooling	14.7	2.5
Working/earning a living	8.3	4.9
Other	2.3	8.5

Source: HiFy Survey Round 4

¹⁹ World Bank. 2018. World Development Report 2018: Learning to Realize Education's Promise. Washington, DC: World Bank

²⁰ We use the 2020 GDP figure of US\$1,058 billion, following <http://pubdocs.worldbank.org/en/963481563917599502/mpo-idn.pdf>

²¹ World Bank. 2018. Towards a Comprehensive, Integrated, and Effective Social Assistance System in Indonesia.

²² Punamasari, R. and Ali, R. 2021. Indonesia COVID-19 Observatory: Education Services During the COVID-19 Pandemic - November to December 2020. World Bank, Washington, DC.

²³ Female out-of-school prevalence (1.7 percent) is lower than male (2.2 percent).

The impact of COVID-19 pandemic school closures may be greater for children with disabilities.

For those children with special needs who received strong support at school, home schooling means that support now needs to be provided by their families in order to continue their learning, therapy, and counseling. An online survey was conducted by UNICEF and a local NGO covering 533 participants from 14 districts and cities in Indonesia to analyze the impact of COVID-19 on students with disabilities.²⁴ The study found 73.5 percent of students with disabilities had difficulties in accessing online learning, and major challenges included difficulty in focusing (46.3 percent), budget for internet data (38.6 percent), and access to the internet (27.5 percent).²⁵ In addition, the level of perceived support for students with disabilities including access to health and therapeutic services, support from special education and counseling guidance teachers, provision of individual learning programs, and infrastructure support, have significantly decreased, from 71.6 percent before the COVID-19 outbreak to 50.1 percent during the pandemic, as reported by parents and caregivers. These findings suggest that majority of students with disabilities have difficulty in accessing education during the pandemic, which may further increase their learning loss.

Early direct evidence on the actual impact of school closures and distance learning has been collected by Lim et al., forthcoming. They find no observed learning loss for students in Bukittinggi, West Sumatera between March and Oct 2020, which is both cause for hope and concern. Hope, because the authors find that parents have stepped in to support students in their learning, but concern, because this experience is not likely to be representative for Indonesia as whole. Bukittinggi has a large urban center, and is among the highest performing regions in terms of student test scores pre-COVID, well above the national average for SMP and above other high-performing urban areas such as Jakarta and Yogyakarta. While it is very impressive that there is no evidence of learning loss during the first three months of school closure, it is indicative of the expected increase in

inequality that school closures are generating, where high performers will do better, and the rural poor are expected to lose the most human capital.

ii. Prospective learning loss

The estimates of prospective learning loss based on different scenarios for future school opening and closure from July – Dec 2021 suggest that COVID-19-related school closures may result in an additional loss of 0.3 year of LAYS for students in Indonesia.

Before the pandemic hit, Indonesian children accumulated, on average, 7.8 years of learning. The earlier simulations on the retrospective loss suggest that this number could fall to 6.9 assuming the effectiveness of alternative modalities is 40 percent. In this section, we estimate additional loss based on the three scenarios of school closure from July to December 2021. As the baseline for the three possible prospective learning loss scenarios, we assume that alternative modalities were 40 percent effective, with a retrospective learning loss of 0.9 LAYS. The 'optimistic' scenario assumes that 100 percent of schools will reopen in July 2021 as the teacher vaccination program is completed in June 2021. The 'intermediate' scenario assumes that only 50 percent of schools can reopen for face-to-face learning in July 2021 due to slow progress in the teacher vaccination program and number of COVID19 cases in the country is not improving. Our 'pessimistic' scenario assumes that zero percent of schools can reopen in July 2021 due to the number of COVID19 cases surging again, forcing the government to require all schools to be fully closed.

Under the optimistic scenario in which all schools are assumed to reopen in July 2021²⁶, the LAYS will stay at its current estimated value of 6.9 years, down from 7.8 years pre-pandemic. Under the intermediate and pessimistic scenarios, in which only 50 of schools reopen, the additional loss of LAYS declines by 0.1 years. While under the worst scenario where all schools have to close again in July 2021, the LAYS further declines by 0.3 points to 6.6 years of LAYS (Figure 2.1). The magnitude of these losses

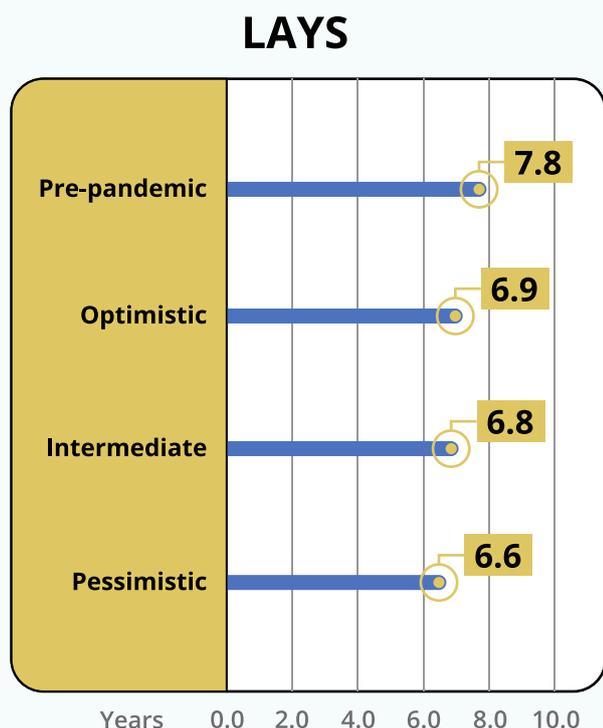
²⁴ Rohman & Sumarlis (2020).

²⁵ 21 percent of surveyed students in this study are students with physical disability, 68 percent have non-physical disability (mental and/or intellectual) and 11 percent have multiple disabilities.

²⁶ We note that as of end of August 2021, more than 2/3 of schools nationwide are still closed.

is proportional to the length of observation period. If the period of school closure is extended beyond December 2021, we would expect even larger loss.

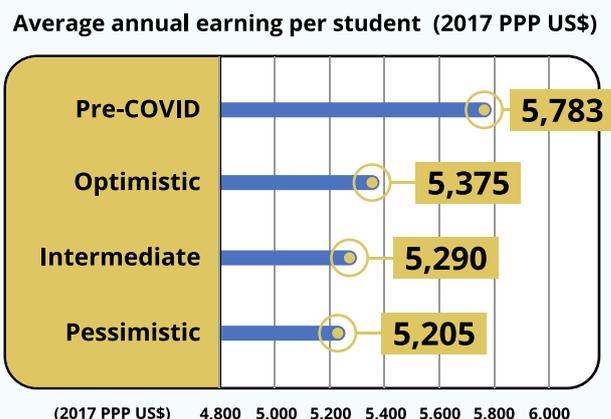
Figure 2.2 Estimated total learning loss measured in LAYS (Learning Adjusted Years of Schooling) based on scenarios between January 2020 - December 2021



This learning loss can be quantified in terms of labor market returns, since human capital and future earnings are correlated. Education can make workers more productive by giving them the skills that allow them to increase their output.²⁷ Our estimates show that the average student already faces a reduction of US\$408 in yearly earnings even if all schools reopen in July 2021. If only half of them open between July and December 2021, or if all of them remain closed until December 2021, students will lose an additional US\$493, and US\$578 respectively in yearly earnings once s/he enters the labor market. Using 2017 US dollar purchasing power parity (PPP) in Indonesia, this would lead to a present value loss in lifetime earnings for all students of about US\$306 billion under the intermediate scenario, equivalent to 29 percent of 2020 GDP.²⁸ Assuming prolonged

school closure under the intermediate and pessimistic scenarios, the present value loss in lifetime earnings for all students would be higher at US\$ 306 and US\$359 billion respectively.

Figure 2.3 Impact on average annual earning per student



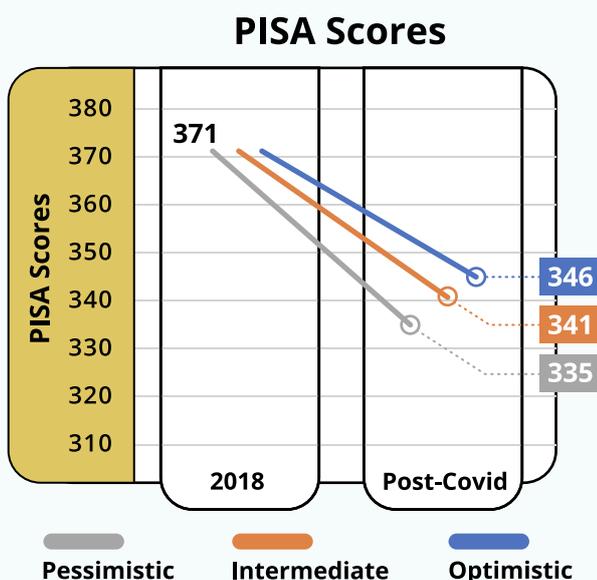
The prospective estimates show that secondary students in Indonesia will lose on average up to eleven points on their PISA reading score, in addition to the points lost through June 2021. Under the optimistic scenario in which all schools resume face-to-face learning in the new academic year starting July 2021, the PISA reading score will decline from its pre-COVID-19 level at 371 to 346. Under the intermediate scenario, with the projected school closure assumed to affect about 50 percent of schools in the new academic year starting July 2021, the PISA score will decline on average an additional six points to 341. Under the pessimistic scenario in which all schools have to be fully closed again from the period July to December 2021 due to slow progress in teacher vaccination program and/or surging new COVID-19 cases, the PISA score will decrease six more points to 335 (Figure 2.3). The share of students who do not meet PISA minimum reading proficiency at age 15 thus rises from 70 percent in 2018 to 81, 83, and 85 percent under the optimistic, intermediate, and pessimistic scenarios, unless effective learning recovery measures are quickly enacted. This result highlights the importance of equipping teachers and schools to teach a majority of students who may not meet the minimum expected level of proficiency and

²⁷ World Bank. 2018. World Development Report 2018: Learning to Realize Education’s Promise. Washington, DC: World Bank.

²⁸ We use the 2020 GDP figure of US\$1,058 billion, following <http://pubdocs.worldbank.org/en/963481563917599502/mpo-idn.pdf>.

supporting them to catch up on their learning. This measure of learning poverty was already high in Indonesia pre-COVID-19, and the school closures are expected to increase learning poverty still further.

Figure 2.4 Estimated total learning loss on PISA scores based on scenarios between Jan 2020 - Dec 2021

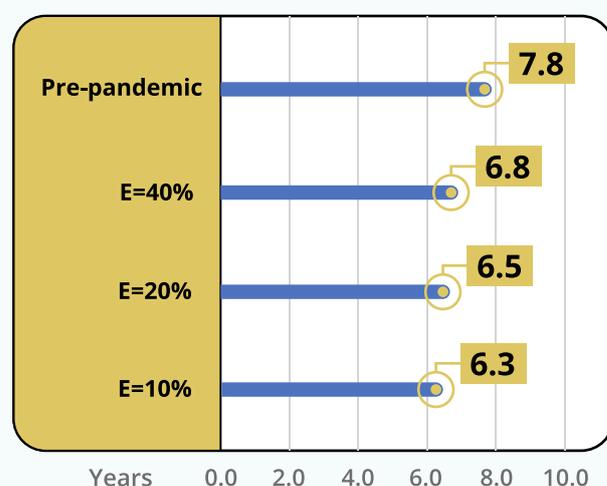


The effectiveness of distance and hybrid education is the most important factor contributing to the magnitude of learning loss. Our analysis above assumes that alternative modalities are 40 percent as effective as face-to-face instruction. For comparison, we estimate here the impact of school closures on LAYS and PISA scores when the E (effectiveness) is set lower at 20 and 10 percent results in mitigation levels of $m = 19$ and 9 percent, respectively. The results of the decreased effectiveness estimates show that LAYS reduces from 7.8 years to 6.5 years and 6.3 years, respectively, when other parameters including duration of closure are left unchanged. These results are lower than in the original pessimistic scenario (6.8 years), meaning that effectiveness is more important than duration, within the limits examined by this model. Similarly, the estimated PISA reading scores are 332 and 327 when the effectiveness parameters are set at 20 and 10 percent, respectively, which are lower than the estimated results under the original pessimistic scenario. These results from our model show that mitigation measures are more important than the

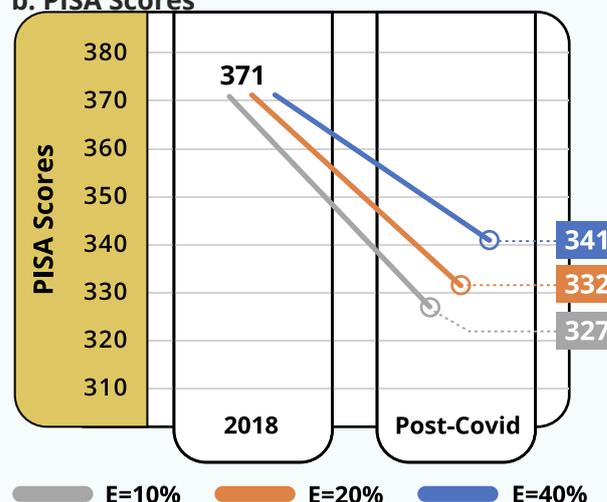
absolute length of school closure periods. This emphasizes the *importance of prioritizing the quality of distance learning programs* and materials to ensure that students are able to engage in learning now and in future crises.

Figure 2.5 Estimated impact on LAYS and PISA scores with variation in the effectiveness parameter

a. LAYS



b. PISA Scores



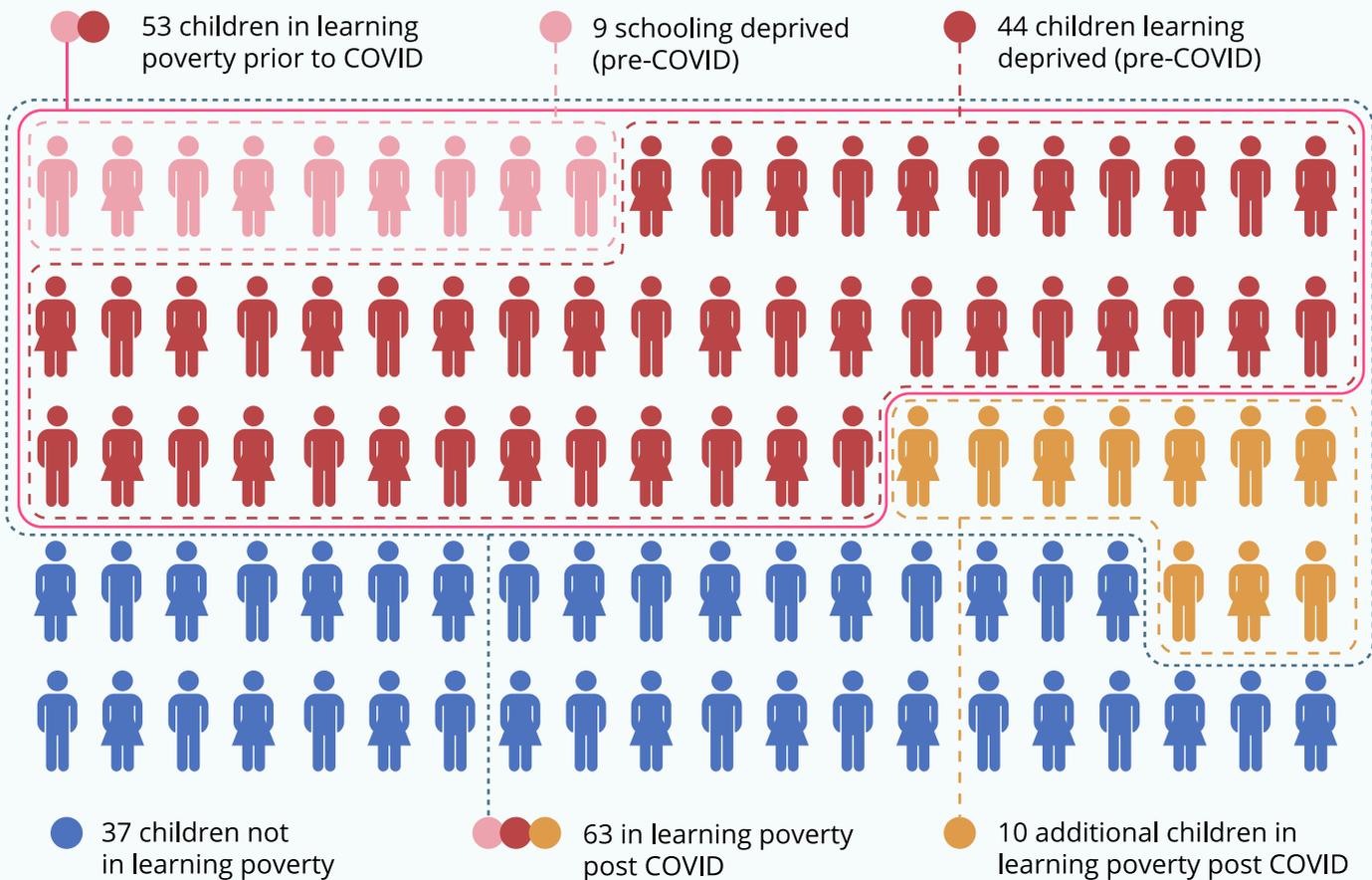
Under the optimistic scenario in which all schools resume face-to-face learning in the new academic year starting July 2021, the PISA reading score will decline from its pre-COVID-19 level at 371 to 346.

2.3 How Does This Compare with Learning Losses Globally?

The estimated global impact of COVID-19-related school closures is that it will increase global learning poverty from 53 to 63 percent (Azevedo, 2020a). Assuming the absence of effective remediation and mitigation, most of this increase in learning poverty is expected to occur in lower middle-income and upper middle-income countries, especially in East Asia and the Pacific, Latin America, and South Asia.²⁹ How much learning loss takes place and how much learning is recovered depends on each country's policy responses and the actions taken by parents, teachers, schools, students and systems.

Figure 2.6 Learning poverty increase due to COVID-19-related school closures

For every 100 children in **low and middle-income countries**



Source: Azevedo, 2020a.

²⁹ Azevedo, Joao Pedro. 2020a. Learning Poverty: Measures and Simulations. Policy Research Working Paper No. 9446. World Bank, Washington, DC. World Bank. <https://openknowledge.worldbank.org/handle/10986/34654>.

Indonesia is not the only country to suffer learning loss due to the COVID-19 pandemic.

Learning poverty increases are largest in South Asia, with a 16.5-percentage-point change in the absence of effective learning recovery (Azevedo, 2020a). As a region, South Asian countries are predicted to move from 58.2 to 74.7 percent of children unable to read and understand a simple text by age ten. In Latin America, school closures at all levels affected over 170 million students, compared with approximately 68 million in Indonesia. Despite major efforts made by many countries to mitigate lack of face-to-face education through remote learning, learning poverty is expected to increase in Latin America by more than 20 percent, and learning losses will be substantially larger for the most disadvantaged students.³⁰

Some countries in the region appear to have avoided large levels of learning loss, such as the Republic of Korea. As a high-income country with some of the most networked households in the world, the Republic of Korea was able to quickly shift to effective, online learning for almost all students at the onset of the pandemic. The Government partnered with the private sector to ensure that even the poorest students had access to devices and internet connections. It also took other steps to prevent online bullying and adapt resources for hearing- and sight-impaired students. As a result of these efforts, student learning levels declined very little during the pandemic, based on a review of available assessment data. There was a shift away from the middle, as the proportion of students performing at the low and high ends of the distribution increased, while proportion of those performing in the middle of the distribution decreased (Yarrow, Yoo and Kim, forthcoming).

Other higher income countries in the region were apparently able to minimize learning loss, while learning losses were also estimated to be low for the poorest countries, according to recent estimates. Some lower income countries with low levels of pre-pandemic learning were able to avoid large levels of learning loss. This was no victory however, since the low levels of loss were a result of the more modest difference between schools being open and schools being closed. For example, the projected decrease in LAYS for high-income countries in EAP was one year, while for developing EAP countries it was 0.7 (Azevedo, 2020b; Cloutier et al., forthcoming; and World Bank, 2020).

□□ **As a high-income country, the Republic of Korea was able to quickly shift to effective, online learning for almost all students at the onset of the pandemic.** □□

³⁰ World Bank. 2021. Acting Now to Protect the Human Capital of Our Children: The Costs of and Response to COVID-19 Pandemic's Impact on the Education Sector in Latin America and the Caribbean. World Bank, Washington, DC. World Bank. <https://openknowledge.worldbank.org/handle/10986/35276>

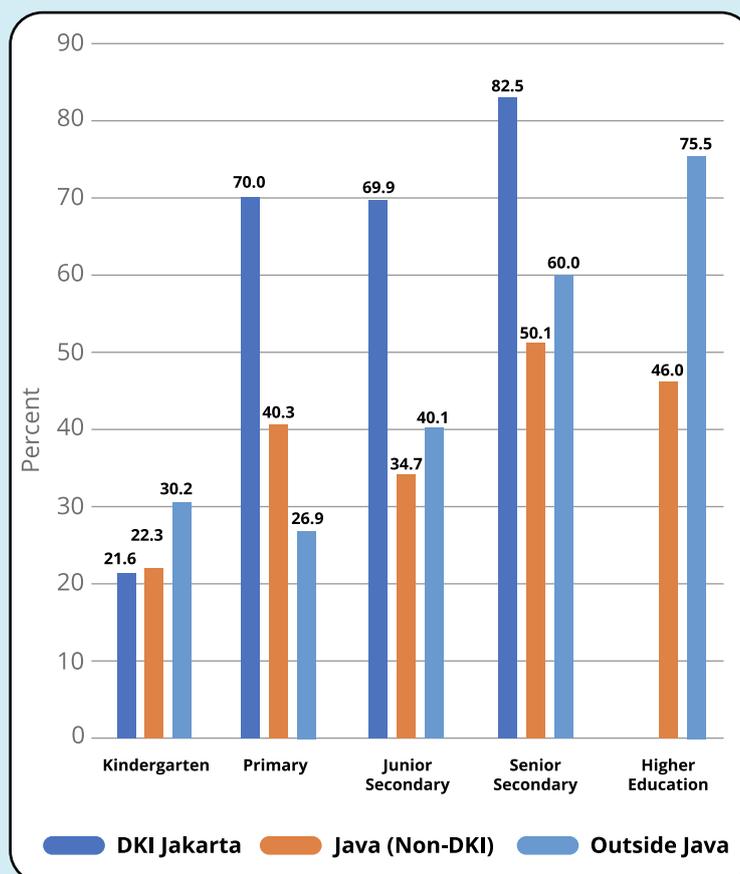
BOX 2.1

Government support and the situation of learning in Indonesia today

The World Bank conducted a series of nationally representative surveys in May, June, August and November 2020. These High Frequency (HiFy) phone-based surveys of 4,000 households across 40 districts and 35 cities in 27 provinces allow us to compare government interventions and student/family actions over time.³¹ The HiFy survey found that, as of November 2020, most schools remained closed and 93 percent of students were engaged in distance learning. 25 percent of students received hybrid learning (combined face-to-face and distance learning) and the rest were accessing fully online or distance learning, at least in theory. About six percent of students were attending face-to-face learning. Schools that were open for face-to-face learning were mostly in rural areas and outside DKI Jakarta. Among those schools that remained open for face-to-face learning, most students attended school only for a few days a week.

In June 2020, 42 percent of households with K-12 students were engaged in online learning, and this proportion remained stable for a second survey round in November 2020. Although free internet support from MoECRT was launched in September 2020, use of online learning remained at about 41 percent on average across levels of schooling through November 2020. The data consistently show that students of families with lower levels of household income are less likely to use online learning. Use of online learning was also significantly higher for DKI Jakarta, with 72 percent of the students using online means for learning in the previous seven days, which is twice as many as other regions in Java and regions outside Java (Figure 2.7).

Figure 2.7 Use of mobile learning/online learning



Source: HiFy Survey Round 4 (November 2020)

While the majority of students continued to participate in distance learning, time spent on learning and learning modalities varied significantly across regions and socioeconomic groups.

Students from the bottom 40 percent households spent the least time on distance learning, with an average 2.2 hours per day, while students from the top 20 percent households spent 2.7 hours per day. Students from the richer households have more access and options to engage in distance learning. Students in DKI Jakarta also have significantly higher hours spent on distance learning compared with their peers outside DKI Jakarta, with an average 3.5 hours per day. The learning modality that is most often cited is the completion of assignments provided by teachers (98 percent), while only 41 percent of students use mobile learning apps and/or online schooling for distance learning.

³¹ <https://www.worldbank.org/en/country/indonesia/brief/indonesia-covid-19-observatory>

Figure 2.8 Type of learning activities conducted at home



Source: HiFy Survey, R2 and R4.

Seventy-one percent of students reported facing at least one constraint in their distance learning activities.

The main constraints reported include limited internet access, difficulties focusing and concentrating, and the lack of a suitable supporting device. Other internal constraints reported include no guidance from parents/other adult household members and no/limited space for study at home.

3

Looking Forward: Returning to Learning

What needs to happen now to prevent the estimated losses from widening, and how do we recover learning? The Government, development partners and other stakeholders are acting now to mitigate and recover from learning loss and ensure that children return to learning. Safe school reopening is essential, but ensuring return to learning is even more important. MoECRT and MoRA have recently moved to create a Learning Recovery Task Force, which will work on these challenges.

Revitalizing the national education system to focus on student learning outcomes. Instead of simply reopening the former education system, which delivered low levels of student learning on average, the Government could support the opening of a renewed and revitalized system that focuses on student learning, especially for those in rural areas and from low-income families. MoECRT's program of reform includes essential changes in areas of teacher recruitment and teacher training, among others, and the adoption of promising approaches, such as student centered learning and the more intensive use of formative assessments to help understand what students are struggling with and provide the support they need.³² These fundamental changes will be challenging to implement, but now is the time to introduce these improvements to schools, teachers, students and parents alike.



While these changes will be difficult to fully implement in a decentralized education system, they are crucial to Indonesia's future success. The Fourth Industrial Revolution and disruptive technologies requires increasing levels of digital skills for children, parents and job seekers to successfully navigate a changing world. The time is now to make these changes. Indonesia faces multiple constraints, and there are different possible futures depending on how current challenges are approached. In the spirit of the World Bank's twin goals of ending extreme poverty and boosting shared prosperity, we offer the following suggestions, a number of which are already being implemented by the Government.

³² Starting in 2021, MoECRT will conduct a national assessment that consists of: (i) a minimum competency assessment that measures student numeracy and literacy levels at grades 5, 8, and 11; and (ii) a character survey that measure student achievement in social-emotional learning outcomes. [<https://hasilun.puspendik.kemdikbud.go.id/akm/frontpage/detail>]

□□ **Psycho-social support to school staff and students is a challenging but important area to address. This could include support for principals and teachers, and communities.** □□

3.1 Short term (next three months)

Since most schools are closed and distance learning is still the most common learning modality, what can be done now to ensure that distance learning results in higher levels of learning? Education offices at both district and provincial levels can conduct outreach to schools in their respective areas and identify those that need additional support, especially teachers who have difficulties in delivering remote instruction. This is not a 'one-size-fits-all' approach, but rather a targeted campaign to identify those schools and teachers most challenged to deliver remote instruction. Most teachers and districts are already making efforts to reach all children, but aligning support to where it is most needed is essential to prevent dropouts and disengagement from learning, particularly for the poorest families and children with disabilities.

Psycho-social support to school staff and students is a challenging but important area to address. This could include support for principals and teachers, and communities. School reopening is a challenge for all stakeholders, so it is important that principals and teachers receive help and advice from local education offices, which can establish (separate)

helpdesks for principals and teachers to provide consultation and advice. Communities also need contact information for raising issues and concerns, to better support children who may have challenges re-starting face-to-face learning.

COVID-19-related closures have brought the classroom into the home and turned many parents and caregivers into assistant teachers.

There is an opportunity to build on this experience and support parental engagement in education. This could take the form of strengthened and expanded school committees as laid out by the latest Joint Regulation of MoECRT, MoRA, MoH, and MoHA in March 2021³³, involving parents in decisions about school reopening and possible re-closing. Learning recovery can be supported by offering continued home learning in combination with face-to-face education once schools reopen. Finally, it is essential that the Government continues its active preparation of student learning assessments and the development of catch-up plans, as well as training teachers in diversified teaching methods to use in remedial education. These preparations need to be completed in order for children successfully transition back to face-to-face learning.

³³ Joint Regulation MoEC – MoRA - MoH – MoHA Number 03/KB/2021, Number 384 of 2021, Number HK.01.08/MENKES/4242/2021, Number 440-717 of 2021

3.2 Medium term (six months to one year)

Expand communication between teachers and parents to better track student learning and provide individualized support. The new national assessment regime along with increased use of formative assessments by teachers can be leveraged to inform parents and students about learning recovery plans and what their respective roles are in supporting students to catch up on learning loss. Schools can engage with students and parents to discuss expectations and processes.

Evaluate different online learning programs and platforms. Unfortunately, this is unlikely to be the last school closure in Indonesia. Future pandemics, natural disasters or other crises may close a portion of schools for weeks or more. As our model shows, the most important factor in determining student learning loss during these periods of school closure is the effectiveness of the distance learning intervention. MoECRT and MoRA can leverage their relationships with private sector online education providers to rigorously evaluate learning gains and identify areas for improvement, including adaptive learning technologies for students with disabilities.

With the Government's plan to gradually reopen schools once teachers are vaccinated, schools can be supported and required to comply with long-standing health guidelines, including ensuring functional WASH facilities. A recent study on WASH facilities at schools and madrasahs found that 47 percent of MoECRT schools in the sample had no soap and running water. Similar conditions were found in primary MoRA schools (Afkar et al., 2021). Soap and handwashing facilities should be required at every school to prevent the spread of the COVID-19

virus and other diseases, and to enable students and teachers to practice basic hygiene. Immediate actions to address this can include: (i) supplying necessary hand soap; and (ii) installing handwashing facilities with running water if currently unavailable, as well as maintaining the soap supply and handwashing facilities. These investments will be costly; a World Bank study estimates that upgrading toilet facilities to minimum standards will cost IDR 18.5 trillion (US\$1.3 billion), while installing or upgrading handwashing and water facilities will cost IDR 1.77 trillion (US\$125.5 million) (Afkar et al., 2021). WASH facilities at schools can be maintained using BOS (School Operational Grants) funds. As part of the government COVID responses, MoECRT can also increase the flexibility in the usage of BOS for COVID-related expenditures such as to procure liquids or hand sanitizer soap, disinfectants, masks or other hygiene support.³⁴

While all students will need assistance to recover lost learning, both national and subnational governments can collaborate with teachers and schools to identify those children with the highest risk of not catching up and dropping out. Re-enrollment campaigns and provision of additional support, such as tuition fee waiver or subsidies in addition to the PIP (*Program Indonesia Pintar*) program, can be implemented to minimize student dropouts. The Government can equip teachers with the capacity and resources to conduct diagnostic assessments to identify students who are lagging behind and understand student learning losses. Teachers can be supported to interpret and act on these assessment results to provide differentiated assistance, such as teaching at the right level to promote student learning recovery.

³⁴ MoEC regulation No. 19/2020 on the revised technical guidelines of BOS. According to MoEC regulation No. 19/2020, principals can provide internet quota subsidies for students and teachers, pay subscriptions for online learning courses/platforms, pay transport allowances for teachers who pay home visits to students, procure laptops and tablets or print more learning materials and worksheets for students, liquids or hand sanitizer, soap, disinfectants, masks or other hygiene support.

3.3 Long term (one to three years)

To support future resilience and hybrid instruction, the Government can use information from the evaluations recommended above to make infrastructure, resource and capacity investments on a national scale to advance the use of technology in teaching and learning. This would help to improve the quality of distance learning materials and the capacity of teachers to deliver remote instruction. Teaching remotely involves more than replicating classroom instruction strategies in an online form. Integrating essential digital skills for teaching and e-pedagogical skills into teacher training material could help improve teacher capability in remote teaching, and eventually improve the quality of distance learning. Expanding access to distance education by expanding internet and other forms of connectivity, as well as access to supporting devices, should be targeted in areas with the greatest need.

To better inform the status of school closure across districts/cities and provinces and impacts on student learning, the government can improve the accuracy of the national data system to track school conditions in real time. Many areas in Indonesia are prone to natural disasters and, as a consequence, a good data system is needed not only for the current COVID-19 pandemic, but also in facing future crises. A reliable and timely data system is needed to map the status of each school (closed, partially closed, open, etc.), identify school needs (number of handwashing facilities, toilets, classrooms, or other school facilities), and monitor school/teacher/student conditions (needs of teachers, student dropout, etc). This information is crucial for the Government to implement a more effective emergency education plan during crises. The current education data systems, MoECRT Dapodik and MoRA EMIS, have accuracy and timeliness issues where discrepancies were found between the observed and captured data (Santoso et al., 2020). To improve these systems' accuracy and timeliness, the Government can develop a more integrated and comprehensive data accuracy audit system across ministries where missing data and errors can be recognized for follow up. Greater transparency and wider socialization (for example, informing parents and the public to see some basic data on schools while protecting sensitive student and teacher information) can aid in this effort. An integrated and accurate data system would help government to track children who dropped out because of the pandemic and identify other lagging students to provide necessary outreach and support.

Many areas in Indonesia are prone to natural disasters and, as a consequence, a good data system is needed not only for the current COVID-19 pandemic, but also in facing future crises. A reliable and timely data system is needed to map the status of each school (closed, partially closed, open, etc.)



Bibliography

- Afkar, R., Kumala, C., Nomura, S. 2021. Improving Toilet Hygiene and Handwashing Practices During and Post-COVID-19 Pandemic in Indonesian Schools. World Bank, Washington, DC. World Bank.
- Afkar, R., Yarrow, N., Surbakti, S., Cooper, R. 2020. Inclusion in Indonesia's Education Sector : A Subnational Review of Gender Gaps and Children with Disabilities. Policy Research Working Paper No. 9282. World Bank, Washington, DC. World Bank. <https://openknowledge.worldbank.org/handle/10986/33943> License: CC BY 3.0 IGO
- Azevedo, J.P. 2020a. Learning Poverty: Measures and Simulations. Policy Research Working Paper;No. 9446. World Bank, Washington, DC. World Bank. <https://openknowledge.worldbank.org/handle/10986/34654> License: CC BY 3.0 IGO.
- Azevedo, J.P. 2020b. Learning Poverty in the Time of COVID-19: A Crisis Within a Crisis. World Bank, Washington, DC. World bank. <https://documents1.worldbank.org/curated/en/163871606851736436/pdf/Learning-Poverty-in-the-Time-of-COVID-19-A-Crisis-Within-a-Crisis.pdf>
- Azevedo, J.P., Hasan, A., Goldemberg, D., Iqbal, S.A., Geven, K. Country Tool for Simulating COVID-19 Impacts on Learning and Schooling Outcomes. World Bank, Washington, DC. World Bank.
- Azevedo, J.P., Hasan, A., Goldemberg, D., Iqbal, S.A., Geven, K. 2020. Simulating the Potential Impacts of COVID-19 School Closures on Schooling and Learning Outcomes : A Set of Global Estimates. Policy Research Working Paper;No. 9284. World Bank, Washington, DC. © World Bank. <https://openknowledge.worldbank.org/handle/10986/33945> License: CC BY 3.0 IGO.
- Cloutier, M., Azevedo, J.P., Goldemberg, D. 2020. EAP country tool for simulating the potential impacts of COVID-19 school closures on schooling and learning outcomes. World Bank, Washington, DC. World Bank.
- Cloutier, M., Azevedo, J.P., Goldemberg, D., Lathapipat, D. Forthcoming. Back to the Future: Why as school reopen, we cannot go back to the past (World Bank, Washington, DC. World Bank.
- Kraay, A. 2019. The World Bank Human Capital Index: A Guide. Published by Oxford University Press on behalf of the World Bank. © World Bank. <https://openknowledge.worldbank.org/handle/10986/34343>
- MenKes. 2020. Joint Regulation MoEC – MoRA – MoH – MoHA No. 01/KB/2020, 516, HK.03.01/MenKes/363/2020, 440-882.
- Menkes. 2020. Joint Regulation MoEC – MoRA – MoH – MoHA No. 03/KB/2020, 612, HK.01.08/MenKes/502/3030, 119-4536.
- Menkes. 2020. Joint Regulation MoEC – MoRA – MoH – MoHA No. 04/KB/2020, 737, HK.01.08/MenKes/7093/2020, 420-3987.

- Menkes. 2021. Joint Regulation MoEC – MoRA – MoH – MoHA No. 03/KB/2021, 384, HK.01.08/MenKes/4242/2021, 440-717.
- MenKes. 2021. Joint Regulation MoEC – MoRA - MoH – MoHA Number 03/KB/2021, Number 384 of 2021, Number HK.01.08/MENKES/4242/2021, Number 440-717 of 2021
- MoEC, 2020. Circular Letter No. 4/2020 on Implementation of Education Activities in the COVID-19 Emergency Period.
- OECD. 2019. PISA Results from PISA 2018, Country Note: Indonesia, OECD. https://www.oecd.org/pisa/publications/PISA2018_CN_IDN.pdf
- Purnamasari, R., Ali, R. 2021. Indonesia COVID-19 Observatory: Education Services During the COVID-19 Pandemic - November to December 2020. World Bank, Washington, DC.
- Yarrow, N., Masood, E., Afkar, R. 2020. Estimates of COVID-19 Impacts on Learning and Earning in Indonesia: How to Turn the Tide. World Bank, Washington, DC. World Bank.
- Rohman, Y. F., & Sumarlis, V. 2020. Laporan Penelitian: Kajian Terhadap Dukungan Bagi Peserta Didik Penyandang Disabilitas di Masa Pandemi COVID-19. West Java: Yayasan Wahana Inklusif Indonesia
- Santoso, Luque, J., Khairina, N. N., Adi Wijoyo, W. H. 2020. And Independent Verification of Education Sector Data in Indonesia. World Bank. Washington, DC. World Bank.
- World Bank. 2017. Towards a Comprehensive, Integrated, and Effective Social Assistance System in Indonesia. World Bank, Jakarta. World Bank.
- World Bank. 2018. World Development Report 2018: Learning to Realize Education's Promise. Washington, DC. World Bank.
- World Bank. 2019. Indonesia Learning Poverty Country Brief. World Bank, Washington D.C. World Bank.
- World Bank. 2020. Background paper for the East Asia Economic Update October 2020. World Bank, Washington, DC. World Bank. <https://openknowledge.worldbank.org/bitstream/handle/10986/34497/East-Asia-and-Pacific-Economic-Update-Background-Paper-B-5-Human-Capital.pdf?sequence=44&isAllowed=y>
- World Bank. 2021. Acting Now to Protect the Human Capital of Our Children: The Costs of and Response to COVID-19 Pandemic's Impact on the Education Sector in Latin America and the Caribbean. World Bank, Washington, DC. World Bank.
- World Bank MPO (Macro Poverty Outlook) update Apr 2021 edition (<https://pubdocs.worldbank.org/en/963481563917599502/mpo-idn.pdf>)
- Yarrow, N., Yoo, J., and Kim, H. Forthcoming. EdTech in Korea, World Bank, Washington, DC. World Bank.

