



WAVE 5

National Income Dynamics
Study (NIDS) – Coronavirus
Rapid Mobile Survey (CRAM)

The impact of COVID-19 in education - more than a year of disruption

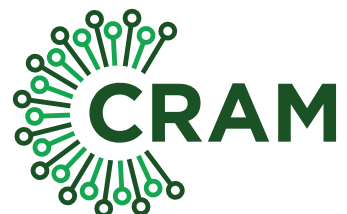
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N.i.D.S.
NATIONAL INCOME DYNAMICS STUDY



CORONAVIRUS RAPID MOBILE SURVEY 2020

The impact of COVID-19 in education - more than a year of disruption

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Abstract

Since the onset of the COVID-19 pandemic, children have been put at greater risk of dropping out of school, lagging behind *and* losing learning, as well as food insecurity and emotional health deterioration. All these issues, as they arise in the South African context, are considered in this policy paper. Specifically, we make use of all five waves of the National Income Dynamics Study – Coronavirus Rapid Mobile Survey (NIDS-CRAM) data to estimate learner dropout/non-return to school, learning losses, changes in and the determinants of parent and caregiver concern and prevalence of depressed mood, child hunger, and access to school meals. These analyses build on previous work conducted on earlier waves of NIDS-CRAM that showed school feeding to lag behind pre-pandemic levels, the majority of parents and caregivers to be very worried about learners returning to school during the COVID-19 pandemic, and 50-75% of a year of lost learning amongst foundation and intermediary phase learners in resource constrained schools (Mohohlwane et al, 2020; Mohohlwane et al, 2021; Shepherd et al, 2021).

In this final policy paper update, we estimate attendance rates amongst 7– to 17-year-olds to be 4-5 percentage points lower than in pre-pandemic times. This implies a tripling of the number of school-going-aged learners outside of the basic schooling system. Factoring in the expected days of in-person instruction lost over the first half of the 2021 academic year, we update our previous estimates of learning lost to show that, since March 2020, as much as a year of learning may have been lost by learners in grades 1 to 9. The transition between NIDS-CRAM Waves 2 and 3—from lockdown level 3 to a less stringent lockdown level 1—and Waves 4 and 5—from adjusted lockdown level 3 to a less restrictive adjusted lockdown level 1—are expected to be linked to significant changes in economic activity, food security, hunger and, potentially, caregiver concern about the return of learners to school. These transitions are explored using dynamic probit regression modelling. We find that although adult worry has declined significantly from 57% in February 2021 to 45% in April 2021, those living in poor, particularly food insecure households, are at greater risk of being very worried and showing signs of depressed mood than those living in less resource-constrained households.. Child access to school meals is shown to significantly reduce the levels of parent worry *and* depressed mood. Finally, we update prior estimates of excess teacher deaths in pandemic times and find the number of excess teacher deaths reported during the 10-week long first term of the 2021 school year (15 February to 25 April 2021) to be 171. This is compared to just more than 1,100 excess teacher deaths during the 8-week long December/January holidays that corresponded with the second wave.

Executive Summary

In order to explore the ways in which COVID-19 has impacted basic education in South Africa, previous NIDS-CRAM education papers have examined outcomes such as school attendance, adult concern around school attendance of children in their households, and school feeding. This was achieved through comparing one wave of data to another as lockdown levels and schooling practices changed. In this paper, we use the full five waves of NIDS-CRAM data to understand changes in learner attendance between the 2020 and 2021 academic year, as well as the evolution of adult concern about learners' return to school across waves and national lockdown levels, and how these might be related to household economic strain and school feeding.

10% of adults report that at least one learner in their household had not returned to school in 2021, something that is strongly related to parent worry, household location, and poverty status:

The Wave 5 NIDS-CRAM data was collected between 6 April and 11 May 2021 and included the following question addressed to adult respondents: *“Are there any learners in your household who have not yet returned to school this year?”* The Wave 5 data suggests that learners from approximately 10% of households have not returned to school in 2021. This represents a significant doubling of pre-pandemic (GHS, 2018) and November 2020 proportions, when roughly 3.6 to 5.5% of caregivers and parents reported that learners aged 7-17 years living in their households had not returned to school. The non-return of learners to school is shown to be significantly related to parent worry, location and socioeconomic status of the household. 12-13% of caregivers and parents residing in rural areas, residing in households that ran out of money for food in the previous month, as well as reporting no employment/business income earned by household members, report non-return of learners to school.

To put this in perspective, given that there were approximately 12-million children in Grades 1-12 in South Africa (DBE, 2019)¹, and comparing to household and learner attendance patterns of GHS 2018, under conservative² assumptions one can say that **650,000 to 750,000 children aged 7 to 17 years old were not attending school by May 2021. This represents an increase in the number of absent learners of approximately 400,000 – 500,000 when compared to ‘normal’ times, and a decline in the attendance rate amongst this age group from 98% to 93.4 - 94.2%.** This is an alarming finding, although corroborating UNESCO estimates for the Sub-Saharan African region and data from Latin America, suggesting that high rates of pandemic-related dropout are being found in other, similar, contexts (World Bank, 2021; Lichand et al, 2021)³. However, we would like to emphasise to readers that the NIDS-CRAM survey, which asks adults about their households and the children living in those households, does not allow us to produce child-weighted estimates. Therefore, these projections are based on assumptions regarding the distribution of children aged 7-17 years and adults across households using the GHS 2018 as reference.

Most households reporting that at least one learner *had not* returned to school in 2021 also reported that some other learner in the household *had* returned to school (i.e. households are not keeping *all* of their children from school, but rather some have returned while others have not). Whilst it emerges that 1 in 10 households with school-going aged children report non-attendance of at least one child, the vast majority (99%) of households report at least one learner that has returned to school in 2021.

1 Department of Basic Education. 2019. *School Realities 2019*. Accessed online on 27 June 2021, <https://www.education.gov.za/Portals/0/Documents/Reports/School%20Realities%202019%20Final%20.pdf?ver=2020-02-07-101051-330>.

2 Given that the NIDS-CRAM data is a household survey and asks adult respondents questions about their households and the children in their household, it is not always possible to extract child-weighted estimates.

3 World Bank. 2021. Acting now to protect the human capital of our children. Accessed on 27 June 2021, <https://openknowledge.worldbank.org/bitstream/handle/10986/35276/Acting%20now.pdf?sequence=14&isAllowed=y>. Lichand, G., Dória, C.A., Neto, O.L., & Cossi, J. 2021. The Impacts of Remote Learning in Secondary Education: Evidence from Brazil during the Pandemic. *In review*. DOI: 10.21203/rs.3.rs-568605/v1.

Average household attendance rates were lower in April 2021 (95%) than in November 2020 (97%) with significant differences across provinces: The average household attendance rate in the Free State is estimated to be 87% in April 2021, down from 99% in November 2020. The Eastern Cape also showed a significant decline from 96% to 92%. Overall, only 74% and 84% of parents and caregivers residing in the Free State and Eastern Cape report that *all* children in their household have returned to school in 2021. It should be noted that the NIDS-CRAM survey is not designed to be provincially representative, and these results should be seen as tentative and indicative rather than conclusive.

If the rate of learning loss in 2021 due to lost schooling (rotational timetables) is the same as the rate of learning loss in 2020, we estimate that between March 2020 and June 2021 most primary school learners in South Africa have lost 70% to a full year of learning. We update previous estimates of learning losses by assuming that previous losses due to rotational timetables (reported in Shepherd et al, 2021), are the same as the learning losses resulting from the ongoing rotational timetables in 2021 up to and including the time of writing (June 2021). Between February 15 and 30 June 2021, schools were open for a total of 93 days. Assuming that learners would have received in-person instruction for half of these days, and taking our previous estimate of 50-75% of a year of learning lost for each 120 days of schooling lost, we estimate that as much as a full year of learning has been potentially lost by the majority of learners since March 2020.

Adult worry has declined significantly from 74% in 2020, to 57% in the first quarter of 2021, and was now at its lowest level of 45% in April 2021. The panel data provides a dynamic perspective on adult worry over the return to school of learners living in their household. In the first quarter of 2021, 57% of respondents indicated that they were very worried about sending their child to school, down from 74% six months prior. In April 2021, the level of high worry had fallen significantly to 45%. Dynamic modelling of the transition between states of worry about learner return to school indicates that parents and caregivers can deviate from prior levels of worry depending on the conditions of COVID-19 spread and infection and changes in socioeconomic conditions.

Parent and caregiver worry is estimated to increase under conditions of poverty and changes in individual-level perceptions of the risk of getting COVID-19. Adults showing indications of higher-than-average levels of depressed mood and living in persistently large households were significantly more likely to be very worried, whilst those living in households with more consistent access to government grants over time were less likely to be very worried.

Household food security, including children's access to school feeding, emerges as an important determinant of adult worry and depressed mood. Prior analysis using the balanced panel from NIDS-CRAM Waves 2, 3 and 4 indicated erratic access to school meals even across time points when schools were open. School feeding at the beginning of the 2021 academic year had neither deteriorated nor improved from the final quarter of 2020.

In April 2021, access to food at school increased significantly from 49% in November 2020 to 56% in April 2021, although part of the increase may be driven by a change in the reference period of the question between the two periods. Specifically, adults were asked about whether children received food at school at any time during the past *two* weeks. Earlier waves of NIDS-CRAM had asked about access over the past 7 days. The National Education Evaluation and Development Unit (NEEDU, 2021) report⁴ highlighted that the timetable rotation cycle commonly understood to be 5 days may be up to 8 days given large school sizes.

On average, 84% of the more than 10 million targeted 2021/22 learners had received meals over each of the DBE NSNP report cycles between 12 April and 15 June 2020. The DBE was mandated by a High Court ruling on 17 July 2020 to provide NSNP progress reports based on school self-reported data every 15 days. Inspections of the four reports produced between mid-April 2021 and mid-June 2021 indicate that between 78% and 87% of the targeted 10,707,186 learners received

⁴ National Education Evaluation and Development Unit (NEEDU). May 2021. *School functionality in the COVID-19 environment: Practical examples of what works and does not work.*

a school meal. However, much variation exists across provinces: Whilst the average proportion of targeted learners receiving school meals in Gauteng and Limpopo exceeded 95% over the four report cycles, the proportion of targeted learners fed in the Western Cape remained around 60%, whilst feeding in the Northern Cape declined from 80% to 34% over the two months, most likely due to increased learner absenteeism linked to rising infections in the province.

Although food security has improved since April 2020 (NIDS-CRAM Wave 1), the proportion of adults living with children who report household and child hunger in April 2021—estimated at 18% and 14%, respectively—has remained relatively stable since November 2020, and is nearly twice pre-pandemic levels. Applying the NIDS-CRAM weights, just over 3 million adults reported their households to experience both adult and child food insecurity in April 2021; these households are estimated to have on average three child members (17 years and younger). Economic hardships—such as have occurred since the start of the COVID-19 pandemic—force households to confront economic pressures, including an inability to fulfil basic needs of food and shelter. This can lead to adverse mental health outcomes and stress for parents. **40% of adults living with children in food insecure households show signs of depressed mood in April 2021.** This compared to 26% amongst those living with children in food secure households, not significantly different from 12 months prior. **This proportion rises to 51% when we take a lack of child/ren access to food at school into account.**

According to the excess-death analysis of teacher payroll (PERSAL) data, a total of 171 excess teacher deaths were recorded in the 10-week period 15 February to 26 April 2021, representing the first term of the 2021 school year. This is compared to 1,123 excess teacher deaths recorded over the 8-week December/January holidays that coincided with the second wave of infections. The local and international evidence continues to show that the health risks posed by COVID-19 to children are much lower than the risks to adults. Using an excess deaths approach in conjunction with the teacher payroll data (PERSAL), it is estimated that of 401,327 teachers, 2,283 (0.57%) teachers have passed away due to COVID-19 between 27 March 2020 and 27 May 2021. It remains clear that the vast majority of these deaths occurred during the first and second waves of the pandemic in July 2020 and January 2021, and there is no apparent association between the timing of schools being open and increased spread of the virus (NICD, 2021)⁵. Considering this together with the evidence of substantial harm caused to children by the disruptions to schooling, we believe there is a strong case for proceeding with full-time, daily, and traditional timetable attendance of primary school learners, as gazetted by Basic Education Minister Angie Motshekga on 28 May 2021.

5 NICD. 22 January 2021. COVID-19 *Special Public Health Surveillance Bulletin*. Volume 18, Issue 7.

1. Introduction

The COVID-19 pandemic has led governments to enforce various restrictions to economic and social activities. One of the sectors that has been the most affected since the onset of the health emergency has been pre-primary, primary, and secondary education. More than a year after the World Health Organisation (WHO) proclaimed the outbreak of COVID-19 a pandemic, many learners continue to be experiencing either partial or complete school closures (UNESCO, 2021)⁶. At the time of writing this policy paper, the vast majority of learners in countries in Latin America and the Caribbean (LAC) remain without contact, or even virtual schooling.

Prior to 2020, developing countries had made significant strides towards universal basic education: by 2019, primary school enrollment rates had reached over 90% in LAC and over 75% in Sub-Saharan Africa (Lichand et al, 2021). Learners in LAC lost on average three more months of schooling than anywhere else in the world, and some have argued that COVID-10 could take the education systems of LAC back more than 50 years.⁷ Prolonged closure of schools and ECD centres/preschool, combined with the economic and health shocks of the COVID-19 crisis, has serious implications for both the present and future development of children, particularly those living in more vulnerable households (Bacher-Hicks et al, 2020; Chetty et al, 2020; Andrew et al, 2020; Asanov et al, 2021)⁸, and in already fragile schooling systems (UNESCO, 2021; World Bank, 2021). Since the pandemic's onset, children have been put at greater risk of dropping out of school (Lichand et al, 2021), lagging behind and losing learning (Azevedo et al, 2020; Azevedo, 2020)⁹, as well as food insecurity (Nguyen et al, 2021)¹⁰ and emotional health deterioration (Asanov et al, 2021; de Miranda et al, 2020)¹¹. All these issues as they arise in the South African context are considered in this policy paper.

The National Income Dynamics Survey – Coronavirus Rapid Mobile Survey (NIDS-CRAM) is a rapid household survey that employs Computer Assisted Telephonic Interview (CATI) with the aim of tracking the socio-economic impacts of the ongoing COVID-19 crisis in South Africa. Unlike most other rapid online or telephone surveys, NIDS-CRAM attempts to collect data from a nationally representative sample of South African adults aged 18 years and older using a pre-existing sample of individuals from the 2017 round of the longitudinal NIDS study. Since May 2020, five waves of the NIDS-CRAM have been collected, the last being conducted between 6 April and 11 May 2021. The corresponding sample sizes are 7,073 (Waves 1), 5,676 (Wave 2), 6,130¹² (Wave 3), 5,629 (Wave 4) and 5,862 (Wave 5) respectively.

In this policy paper, aspects of our analysis that focus on adult concern, hunger and school feeding will be restricted to the NIDS-CRAM sub-group of respondents who were interviewed in all five waves; that is, the balanced panel sample of 3,456 individuals. Given widespread school closure at the time of NIDS-CRAM Wave 1, questions were limited to access to remote learning (i.e. school books, education programs on TV and/or the radio, and access to educational content online). Waves 2 and

6 19 March, 2021, UNESCO article. One year into COVID-19 education disruption: Where do we stand? Article accessed 28 July 2021: <https://en.unesco.org/news/one-year-covid-19-education-disruption-where-do-we-stand>.

7 <https://www.eltiempo.com/vida/educacion/educacion-en-america-latina-en-1960-por-el-covid-559205>

8 Bacher-Hicks, A., Goodman, J., & Mulhern, C. 2020. *Inequality in Household Adaptation to Schooling Shocks: COVID-Induced Online Learning Engagement in Real Time*. NBER Working Paper Series.

Chetty, R., Friedman, J.N., Hendren, N., & Stepner, M. 2020. *How did COVID-19 and stabilization policies affect spending and employment? a new real-time economic tracker based on private sector data*. National Bureau of Economic Research Working Paper No. w27431.

Andrew, A. et al. 2020. Inequalities in Children's Experiences of Home Learning during the COVID-19 Lockdown in England. *Fiscal Studies* 41, 653–683.

Asanov, I., Flores, F., McKenzie, D., Mensmann, M., & Schulte, M. 2021. Remote-learning, time-use, and mental health of Ecuadorian high-school students during the COVID19 quarantine. *World development* 138, 105225.

9 Azevedo, J.P., Hasan, A., Goldemberg, S. A., Iqbal, & Geven, K. 2020. *Simulating the potential impacts of COVID-19 school closures on schooling and learning outcomes: A set of global estimates*. The World Bank.

Azevedo, J.P. 2020. *Learning poverty: Measures and simulations*. World Bank Policy Research Working Paper No. 9446.

10 Nguyen, P.H., Kachwaha, S., Pant, A., et al. 2021. Impact of COVID-19 on household food insecurity and interlinkages with child feeding practices and coping strategies in Uttar Pradesh, India: a longitudinal community-based study. *BMJ Open*, 11, e048738.

11 de Miranda, D.M., da Silva, B., Athanasio, A. C., de Sena Oliveira, A. C., & Silva, S. 2020. How is COVID-19 pandemic impacting mental health of children and adolescents? *International Journal of Disaster Risk Reduction*, 101845.

12 Given attrition of 28.7% between Waves 1 and 3 (i.e. only 5,046 of the original 7,073 adults from Wave 1 were successfully interviewed in Wave 3), a top-up sample was introduced in Wave 3 resulting in 1,084 additional interviews.

3, corresponding with partial school reopening, included questions on school attendance, access to school meals, and parental concerns about learners returning to school during the COVID-19 pandemic, specifically:

"In the past 7 days, how many young people in your household attended school?"

"For learners in your household that attended school in the past 7 days: What grades are they doing?"

"Are there any learners in your household who have not yet returned to school this year?"

"For learners in your household who have not yet returned to school: What grades are they doing?"

"In the past 7 days, have any learners in your household received a meal from a school?"

"How worried are you about learners in your household returning to school during the COVID-19 pandemic? Not worried, a little worried, or very worried?"

The same questions were included in Wave 5, although timeframes for attendance and the receipt of a meal at school were extended to two weeks. Unfortunately, the timing of Wave 4 did not overlap fully with the reopening of schools in 2021, and therefore only questions regarding concerns about learner return to school and school feeding were asked. All data is weighted appropriately to account for attrition, and standard errors are corrected for the complex survey design (clustering and stratification)¹³.

2. Lockdown phases and school reopening

One of the benefits of the NIDS-CRAM data is the fact that the same respondents are re-surveyed over time, allowing for us to take a dynamic, intertemporal view of outcomes and attitudes. Furthermore, the various waves of NIDS-CRAM were conducted at times when different lockdown regulations were in place. This allows for transitions between states of worry and access to food/school-feeding to be analysed across the various lockdown phases.

As part of initial efforts to respond to COVID-19 infections, a national closure of all schools was implemented from 18 March 2020. *Table 1* provides a summary of the grades and dates during which schools were open, from the start of school return in June 2020 until mid-May 2021 when the most recent collection of NIDS-CRAM data, Wave 5, was concluded. A phase of national lockdown Level 3 was in effect during the period 1 June to 17 August 2020. During this time, two waves of NIDS-CRAM data collection took place: Wave 1, conducted between 7 May and 27 June 2020, and Wave 2, conducted between 13 July and 8 August 2020. During the former, much of the schooling sector remained closed. Government gazettes referring to official school reopening dates (dated 29 May 2020 and 2 August 2020) stipulated that only those learners in grades 7 and 12 were officially allowed to attend school from 8 June 2020, followed by grades R, 6 and 11 from 6 July 2020. However, the gazettes did allow for deviations from phased return based on a school's ability to comply with COVID-19 guidelines as well as approval by the provincial Head of Department. As indicated by Mohohlwane, Taylor and Shepherd (2020)¹⁴ using Wave 2 of the NIDS-CRAM data, positive attendance rates amongst grades 1-5 and grades 8-10 learners were reported for the month of July 2020, although these were significantly below the attendance rates of grades officially open.

Learners across all grades were permitted to attend school from 31 August 2020. This is reflected by estimated average household attendance rates of at least 95% across all grades using NIDS-

¹³ For more detail on the NIDS-CRAM survey design and weighting approach, see Ingle et al (2021).

¹⁴ Mohohlwane, N., Taylor, S., and Shepherd, D. 2020. *COVID-19 and basic education: Evaluating the initial impact of the return to schooling*. National Income Dynamics (NIDS)-Coronavirus Rapid Mobile Survey (CRAM) Wave 2 Working Paper No. 11.

CRAM Wave 3 data (Mohohlwane, Taylor and Shepherd, 2021)¹⁵ collected between 2 November and 13 December 2020. Wave 3 also corresponded with a phase of Level 1 lockdown that was in operation from 21 September to 28 December 2020. We would expect the transition between Waves 2 and 3 of NIDS-CRAM from lockdown Level 3 to a substantially less restrictive lockdown Level 1 to be associated with lower levels of adult concern, as well as lower levels of food insecurity and increased access to school feeding.

The reopening of schools for the 2021 academic year was meant to take place on 27 January 2021. However, a second wave meant that a phase of adjusted Level 3 lockdown was reintroduced on 29 December 2020, remaining in place until 28 February 2021. As a result, the reopening of public schools was delayed by two weeks to 15 February 2021, although private schools were permitted to open two weeks earlier on 1 February 2021. Schools have—apart from school holidays scheduled toward the end of April 2021—remained fully open since then, although most learners continue to attend on a part-time, rotational basis.

¹⁵ Mohohlwane, N., Taylor, S., & Shepherd, D. 2021. *Schooling during the COVID-19 pandemic: An update from Wave 3 of the NIDS-CRAM data*. National Income Dynamics (NIDS)-Coronavirus Rapid Mobile Survey (CRAM) Wave 3 Working Paper No. 7.

Table 1: School reopening and opening dates between 1 June 2020 and 10 May 2021, by grade

The week starting:																																				
		June							July							August							September							October						
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	November					Decem.		February					March					April					May	
Gr	2	9	16	23	30	7	14	1	8	15	22	29	5	12	19	26	3	10						
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Key:

	Schools closed for all or specific grades and no NIDS-CRAM data collection was taking place
	Schools closed for all or specific grades and NIDS-CRAM data collection was taking place
	Weeks during which ordinary schools were open and no NIDS-CRAM data collection was taking place
	Weeks during which ordinary schools were open and NIDS-CRAM data collection was taking place
	Weeks during which the NSC examinations were being written by grade 12 learners
	Earlier 2021 academic year reopening by private schools
	School holidays scheduled for private schools
	Break between 2020 and 2021 academic years

Notes: This table only provides information relevant to ordinary schools.

3. School Attendance

Numerous efforts have been made to estimate the impact of COVID-19 on the drop-out/departure of previously attending learners from school. In June 2020, a World Bank report based on data from 157 countries estimated that the economic shocks caused by the pandemic would result in the school drop-out of approximately 7 million primary and secondary school learners, increasing the out-of-school population by 2% (Azevedo et al, 2020). In July 2020, Save the Children estimated that 7 to 9.7 million children residing in low- and middle-income countries (LMICs), excluding China, were at risk of dropping out of school.¹⁶ Using data from 180 countries, UNESCO estimated in July 2020 that **23.8 million learners across all education sectors** (i.e. ECD centres, preschool, primary and secondary schools, and tertiary institutions) are at risk of not returning to school.¹⁷ Approximately half of these would be accounted for by learners situated in South and West Asia and Sub-Saharan Africa. The analysis puts students in the tertiary sector at greatest risk of non-return, whilst primary school learners are least at risk. However, predicted trends in Sub-Saharan Africa (SSA) put pre-primary learners at greatest risk. UNESCO estimates the percentage increase in students at risk of not returning to lower secondary and upper secondary school in SSA to be 3.2-4.1%.

3.1. Estimated learner dropout/non-return to school using NIDS-CRAM data

Given that the NIDS-CRAM data is a household survey and asks adult respondents questions about their households and the children in their household, it is not always possible to extract child-weighted estimates. We therefore rely on adult reporting of the number of children living in their households who either attend or do not attend school, and the grade level of these learners. As such, the attendance rate for a given household is calculated as the number of learners enrolled in grades 1 to 12 reported by an adult to be residing in their household, and have returned to school, as a proportion of all learners enrolled in grades 1 to 12 reported to live in that same household. A household attendance rate by grade can be similarly calculated. Multiple children within the household could be enrolled in the same grade, although not necessarily all attending. Therefore, a household attendance rate, both overall and per grade level, can range from a value of 0 to 100%.

Table 2 summarises the proportions of adults reporting (i) that NO learners in their household had returned to school, (ii) that SOME but NOT ALL learners in their household had returned to school, and (iii) that ALL learners in their household had returned to school across three datasets: The 2018 General Household Survey (GHS), NIDS-CRAM Wave 3 (November 2020), and NIDS-CRAM Wave 5 (April 2021). To yield a better comparison with the NIDS-CRAM data, analysis using the GHS data is restricted to children aged 7-to-17-years old and the adults living with them.

From the results of the first few rows, we can conclude that very few households with children aged 7-17 years are in a situation in which absolutely no learners have returned to school. In November 2020, approximately 94.7% of South African adults living with children reported that all learners (enrolled in grades 1 to 12) in their household had returned to school. This proportion is significantly lower than that provided by the 2018 GHS (96.8%). By April 2021, the proportion of households with full learner attendance/school return had fallen significantly to 89.9%. Turning attention to households that report no or only some attendance of school-going aged children—that is, a household school attendance rate of less than 100%—the proportion of 5.3% in November 2020 is again higher than the number provided by GHS 2018 (3.1%). By April 2021, this proportion had almost doubled to 10.1%. Comparing average household attendance rates, the value of 94.8% in April 2021¹⁸ represents a statistically significant decline from both the GHS 2018 (97.9%) and November 2020 (97.0%) estimates.¹⁹

16 Save the Children. 2020. *Save our education*. <http://www.savethechildren.net/save-our-education-report/>.

17 UNESCO. 2020. *How many students are at risk of not returning to school?* UNESCO advocacy paper, 30 July 2020. Accessed online (27 June 2021): <https://unesdoc.unesco.org/ark:/48223/pf0000373992>.

18 This value is robust to the inclusion of Grade R learners into the definition of household attendance.

19 Including 18-year-olds into the GHS estimates reduces the average household attendance rate to 95.9%. There is little reason to expect that average household attendance in November 2020 would be higher than under 'normal' times, and so we are more confident that restricting the analysis to 7- to 17-year-olds provides a more accurate comparison with NIDS-CRAM.

Table 2: Adult reported return of learners to school in November 2020 and April 2021

	GHS 2018	NIDS-CRAM November 2020	NIDS-CRAM April 2021
Proportion of adults residing with 7- to 17-year-olds reporting that NO learners in the household are attending/have returned to school	1.0 (0.07)	1.0 (0.25)	0.5 (0.18)
Proportion of adults residing with 7- to 17-year-olds reporting that AT LEAST ONE but NOT ALL learners in the household are attending/have returned to school	2.1 (0.09)	4.3 (0.49)	9.6 (0.84)
Proportion of adults residing with 7- to 17-year-olds reporting that ALL learners in household are attending/have returned to school	96.8 (0.11)	94.7 (0.56)	89.9 (0.86)
Average household attendance rate	98.0 (0.16)	97.0 (0.34)	94.8 (0.47)
Average household attendance rate including 18-year-olds	95.6 (0.23)		
School attendance rate amongst children 7 - 17 years old	98.0 (0.13)		
School attendance rate amongst children 7 - 18 years old	96.2 (0.17)		
Number of children 7-17 years old NOT attending school in 2018	231 233 (15 834)		
Number of children 7-18 years old NOT attending school in 2018	474 078 (22 092)		
Number of children 7-17 years old attending grades 1-12 in 2018	11 050 195 (153 734)		
Number of children 7-18 years old attending grades 1-12 in 2018	11 686 672 (160 188)		

Source: GHS 2018; NIDS-CRAM, Wave 3 (2020) and Wave 5 (2021).

Note: The unbalanced NIDS-CRAM panel is used. Data are weighted appropriately. Standard errors shown in parentheses.

The takeaway from this, then, is that even in ‘normal’ times, and for various reasons (that will be discussed), not all school-going aged children are attending school. If we take the GHS 2018 number of 3.6% of adults reporting non-attendance by at least one learner in their household as a benchmark with which to compare NIDS-CRAM Wave 5, we can conclude that an additional 6.5% are reporting that co-resident learners have not returned to school in 2021.

According to the GHS 2018, roughly 230,000 7- to 17-year-olds across 210,000 (or 3.2% of) households were not attending school in 2018 (i.e. 1.1 children on average). Assuming a similar distribution of learners across households in 2021, and that the 10.1% of adults reporting non-return of learners in April 2021 is indicative of the proportion of households doing the same, we could predict that as many as 520,000 (s.e. = 35,000) additional 7-to 17-year-olds are not attending school in 2021; that is, a total of 750,000 (s.e. = 52,000) 7- to 17-year-olds are predicted to be out of school in 2021 (see *Table 3*). A lower bound estimate would be 470,000 (s.e. = 32,500) additional learners absent if we assume only one learner per household has not returned to school.²⁰ A more conservative lower bound estimate of 420,000 (s.e. = 22,000) would be arrived at if we deflate the estimated 10.1% of households reporting non-return in April 2021 by 10% to be in line with the GHS

²⁰ This assumption appears quite plausible, as the average number of children aged 7 to 17 years living in households that reported some non-attendance/non-return in NIDS-CRAM W5 is roughly 2. Amongst NIDS-CRAM W5 households that reported absolutely no attendance/returns of learners, the average number of 7- to 17-year-old members is 1. Even amongst those households in the GHS 2018 reporting some non-attendance/absenteeism of 7- to 17-year-olds, the average number of non-attending/absent learners within a household was 1.

2018 estimate that the 3.6% of adults reporting some non-attendance/absenteeism were living in 3.2% of households. Therefore, the total number of learners aged 7- to 17-years 'missing' from school in 2021 is estimated to be in the range 650,000 to 750,000. These numbers can be compared with the more than 300,000 primary public-school learners who had, according to a parliamentary response by the Minister of Basic Education, Angie Motshekga, not returned to school by November 2020.

Table 3: Projected numbers of not-attending/absent learners in 2021 (compared to 2002 and 2018)

	Estimate	95% C.I. [LB ; UB]
Number of learners 7-17 years old not attending/absent in 2002 (GHS, 2002)	556,694	[514,365 ; 600,296]
A. Number of learners 7-17 years old not attending/absent in 'usual' times (GHS, 2018)	231,233	[200,185 ; 262,280]
B. Number of learner 7-17 years old not attending/absent in 2021 (NIDS-CRAM Wave 5 projection 1)	753,371	[652,217 ; 854,525]
B - A: Additional 7-17-year-olds not attending/absent in 2021	522,123	[452,019 ; 592,228]
C. Number of learner 7-17 years old not attending/absent in 2021 (NIDS-CRAM Wave 5 projection 2)	705,260	[610,565 ; 799,955]
C - A: Additional 7-17-year-olds not attending/absent in 2021	474,027	[410,380 ; 537,674]
D. Number of learner 7-17 years old not attending/absent in 2021 (NIDS-CRAM Wave 5 projection 3)	650,342	[563,021 ; 737,663]
D - A: Additional 7-17-year-olds not attending/absent in 2021	419,109	[362,836 ; 475,383]

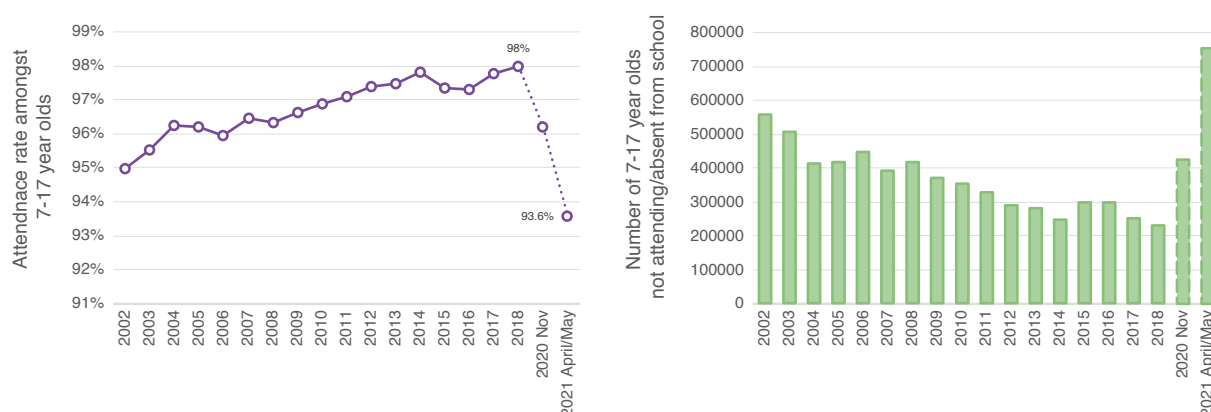
Source: GHS 2002, 2018.

Notes: Projection 1 assumes that, as in GHS 2018, an average of 1.1 learners per household that reports non-attending/absent learners do not attend school. Projection 2 assumes that an average of 1 learner per household reporting non-attending/absent learners do not attend school.

Using the GHS 2018 total number of learners aged 7-17 years and attending grades 1 to 12, this would imply an attendance (absenteeism) rate of 93.4 - 94.2% (5.8 - 6.6%). In other words, a potential tripling of the absenteeism rate amongst learners who, under 'normal circumstances, attend school at a rate of 98%. A historical comparison to the earliest GHS dataset collected in 2002 indicates that the number of 7-to-17-year olds not attending school was approximately 560,000, equivalent to an absenteeism rate of 5% (see *Figure 1*). The effect of the COVID-19 pandemic, therefore, may have taken engagement in schooling back two decades.

The last few rows of *Table 2* indicate the rapid rise of 'usual' dropout/departure once 18-year-olds are included in the analysis. Attendance rates drop off sharply amongst 18-year-olds (73%), 19-year-olds (48%) and 20-year-olds (31%). Given these usually high rates, we refrain from making predictions for these groups.

Figure 1: Number of ‘absent’ (non-attending) learners and attendance rates amongst 7–17-year-olds, 2002 - 2021



Source: GHS 2002 - 2018; NIDS-CRAM Waves 3 and 5 (2021).

Notes: Data are weighted using population weights provided in the GHS data. Projected values for November 2020 and April 2021 are taken from Table 3.

The GHS questionnaire further asks respondents to provide the main reason as to why a household member is not attending any educational institution. The data represented in *Table 4* summarises a pooled cross-section of GHS surveys conducted between 2011 and 2018. The category representing the highest proportion (26%) are linked to reasons of finance and household commitments. A further 13% is linked to performance (e.g. failed exams, unable to perform). The prevalence of non-attendance linked to reasons falling under these two categories are likely to have been exacerbated since March 2020 (see, for example, Casale and Shepherd 2021; Shepherd et al, 2021).²¹ Other unintended factors that compound learner absence, and identified through the recent NEEDU report, are: confusion on which day to attend school, especially amongst young learners; safety concerns amongst ‘walking clubs’ where learners walk to school together but are now allocated different attendance days; and anxiety about homework that was not done during the days they were learning at home. Such factors are now identified as contributors to what is now being called ‘disengagement’, a term used internationally to describe the interaction and process whereby learners gradually lose interest in school.²²

Figure 2 investigates potential correlates of reported non-attendance of learners. In both November 2020 and April 2021, adults reporting that they were very worried about learners returning to school during a pandemic are significantly more likely to report non-attendance of learners in their household when compared to adults indicating that they were a little bit worried. With regards to depressed mood, whilst no significant difference in non-attendance is observed for November 2020, in April 2021, adults indicating signs of depressed mood are significantly less likely to report non-attendance of learners, that is, they are more likely to send their children back to school. The results for April 2021 further indicate that those living in urban informal and rural traditional/ chiefdom areas are significantly ($p < 0.10$) more likely to report non-attendance of learners compared to those living in urban formal areas. Household poverty also emerges as significantly related to non-attendance: adults reporting that their household ran out of money for food last month and that there is no employment and/or business income earned within the household are significantly ($p < 0.10$) more likely to report non-attendance. No significant differences by gender, age or level of education of the respondent are found (results not shown here).

21 Casale, D. and Shepherd, D. 2021. *Gendered employment dynamics during the COVID-19 pandemic: Evidence from four waves of a South African longitudinal survey*. National Income Dynamics (NIDS)-Coronavirus Rapid Mobile Survey (CRAM) Wave 4 Working Paper No. 4.

Shepherd, D., Mohohlwane, N., Taylor, S. and Kotzé, J. 2021. *Changes in education: A reflection on COVID-19 effects over a year*. National Income Dynamics (NIDS)-Coronavirus Rapid Mobile Survey (CRAM) Wave 4 Working Paper No. 10.

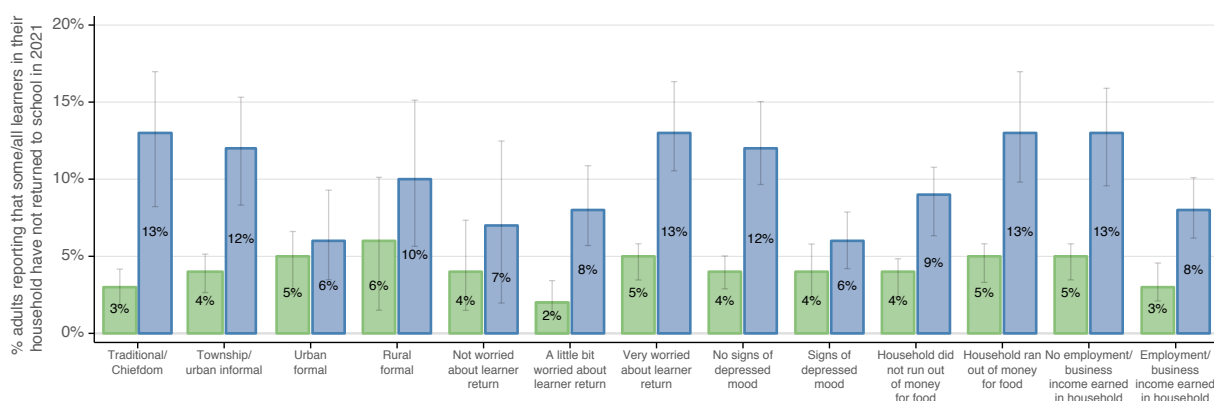
22 Zero Dropout Campaign. 2020. *The Pandemic Edition. School Dropout: Building resilience in our schooling system - before and after COVID-19*.

Table 4: Reasons for not attending school amongst 7- to 17-year-olds, GHS 2011-2018

	Proportion (%)	Average age (years)
All children (7-17 years) not attending an educational institution	3.9	13.3
Reason for non-attendance		
Disability/illness	16.3	13.0
No money for fees/helping at home/childminding	26.3	15.9
Unable to perform at school/failed exams	13.1	15.7
Not accepted for enrolment	4.2	12.9
Satisfied with level of education/don't want to study further	18.6	15.7
Other	20.2	14.3

Source: GHS 2011-2018.

Figure 2: Proportions of adults reporting some children did NOT return by various household/ personal characteristics in November 2020 (green) and April 2021 (blue)



Source: NIDS-CRAM, Waves 3 (2020) and Wave 5 (2021).

Note: The unbalanced panel is used, and data are weighted appropriately. 95% confidence intervals indicated.

3.2. Attendance by grade and province

Prior analyses of NIDS-CRAM Wave 2 data showed that adult reported household attendance rates were approximately 39% on average in July 2020,²³ with significant differences across school grades: 88% of adults living with grade 12 learners reported that these learners had returned to school, compared to 11% of adults residing with grade 9 learners (see *Figure 1*). These differences followed patterns of grade reopening in July and August. By November 2020, average household attendance rates across grades had increased to at least 95%.

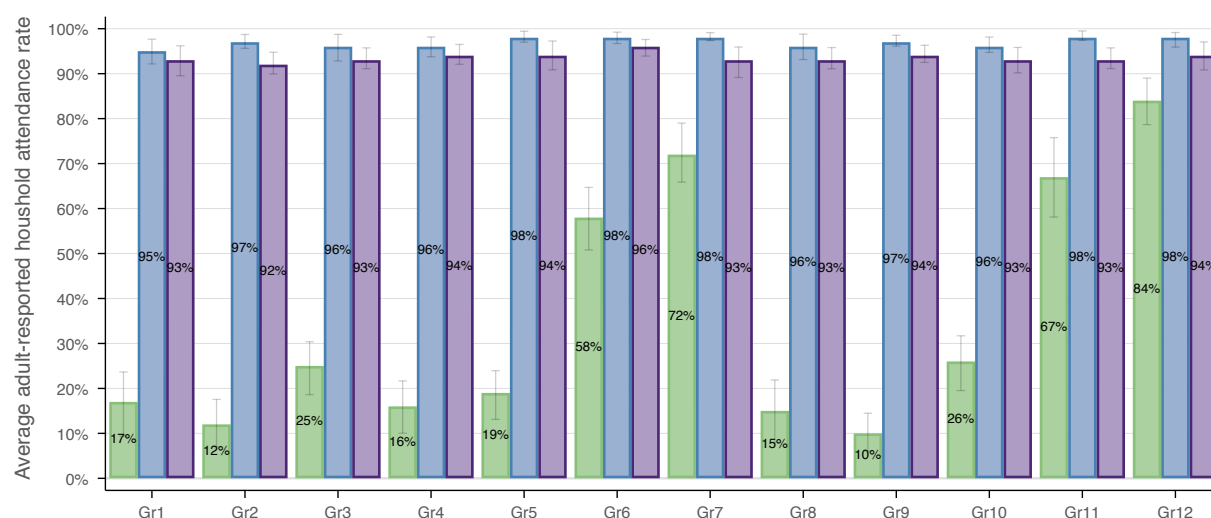
The 'recovery' of attendance towards the end of the 2020 academic year is caveated by the fact that respondents were asked about learner attendance at any point in the seven days prior to the survey, providing a measure of weekly as opposed to daily attendance. Additionally, consideration needed to be given to school timetable guidelines (such as social distancing), resulting in bi-weekly rotational attendance, alternating classes on different days of the week, and platooning. As shown in Shepherd et al (2021), using data collected from foundation phase teachers within the EGRS I and II samples, schools have made use of a variety of rotational options. One of the worst cases cited in the NEEDU report was a 6-week rotation, with children attending for one week out of every six; this

²³ Average household attendance amongst officially 'open' grades (6, 7, 11 and 12) was 71%.

was an especially large school with severe overcrowding. Importantly, the report highlighted that the rotation cycle may be up to 8 days and not 5 days, as commonly understood.

In line with the overall trend of attendance decline reported in *Table 2*, *Figure 3* indicates that average household attendance rates across grades in April 2021 are, although in excess of 92%, down from November 2020 levels, and significantly so in the case of all FET phase grades. At primary-school level, average household attendance is significantly lower in grades 2, 5 and 7. Again, we would like to note that attendance rates for April 2021 will be affected by rotational timetabling that has continued into the 2021 academic year. Furthermore, the question in NIDS-CRAM Wave 5 was altered to capture any attendance by learners over the past two weeks rather than the past 7 days as in earlier rounds of NIDS-CRAM.

Figure 3: Estimated adult-reported household weekly attendance rates by grade in July 2020 (green), November 2020 (blue) and April 2021 (purple)



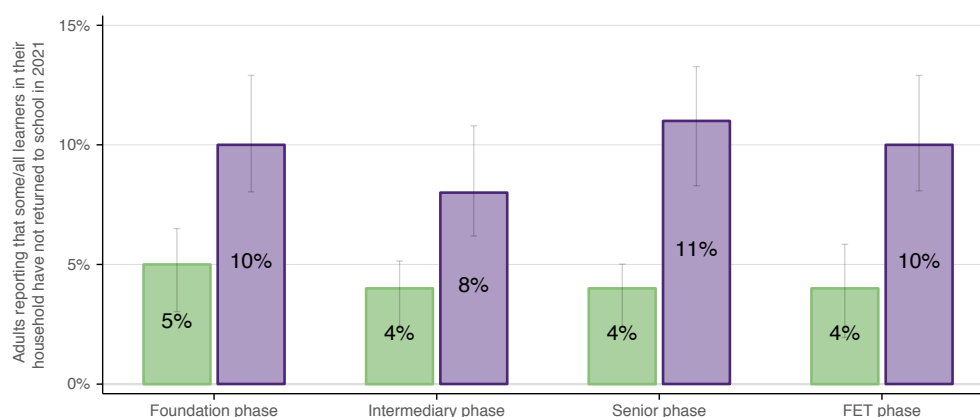
Source: NIDS-CRAM, Waves 2 and 3 (2020) and Wave 5 (2021).

Note: The unbalanced panel is used, and data are weighted appropriately. 95% confidence intervals indicated.

Given the relatively small sample sizes of respondents on which non-attendance of learners for each grade is based, *Figure 4* indicates the proportion of adults reporting that learners living in their household had not returned to school by phase. Adult reports of non-attendance of learners in April 2021, ranging from 8% to 11%, represents a significant increase from November 2020 (4-5%) across all school phases. No significant difference is observed across phases, although it is worth noting that whilst rates of adult-reported non-attendance for foundation and intermediary phase learners have roughly doubled, rates of reported non-attendance in senior and FET phases have almost tripled. This is likely to have implications for graduation rates amongst secondary school learners. As noted by Servaas van der Berg: “Only 42% of children in grade 10 are at the appropriate age, with 21% being at least three years too old. Failing the grade is likely to lead to a lot of drop-out”.²⁴

24 17 January 2021. *COVID-19 likely to send school dropout rate soaring* in the Sunday Times, by Prega Govender.

Figure 4: Proportion of adults indicating the non-return of learners in their household by school phase in November 2020 (green) and April 2021 (purple).



Source: NIDS-CRAM, Waves 3 (2020) and Wave 5 (2021).

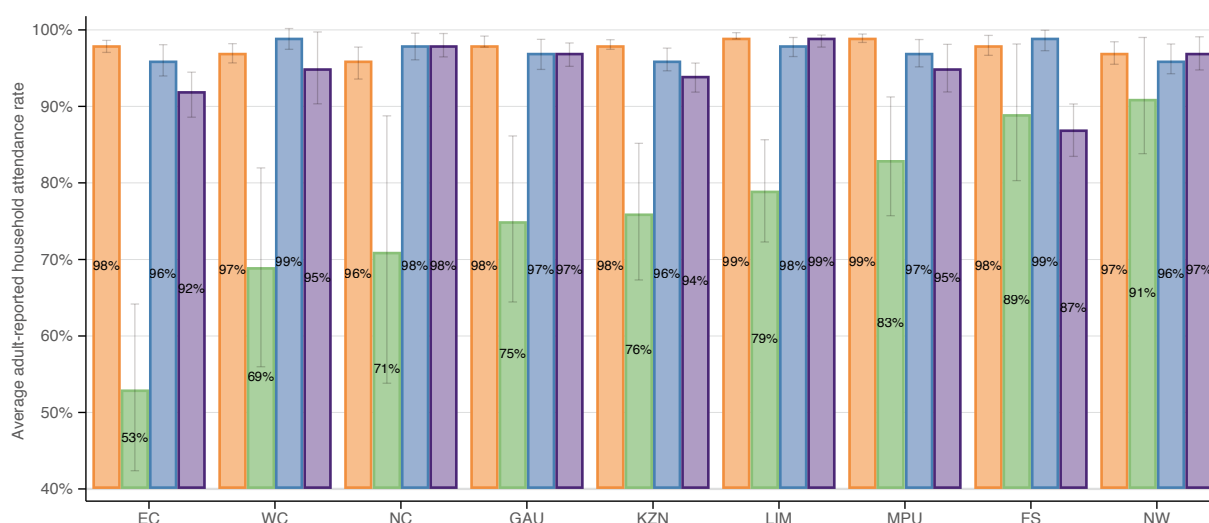
Note: The unbalanced panel is used, and data are weighted appropriately. 95% confidence intervals indicated.

Comparisons of average household-attendance by province are indicated in *Figure 5*. Although all provinces had adult-reported household attendance rates above 96% in November 2020, these had decreased significantly in the Eastern Cape (down 5 percentage points) and the Free State (down 12 percentage points) by April 2021. The North West province has maintained high adult-reported household attendance rates across all waves (July 2020 = 91%, November 2020 = 96%, April 2021 = 97%), whilst the Eastern Cape experienced the most significant increase across waves. High average attendance in the North West and Limpopo are in line with DBE reports of learner absenteeism in November 2020 that were lowest in these two provinces.²⁵ Making comparisons to historical data (i.e. the GHS 2018), average household attendance as reported by adults living with 7-17 year olds has fallen significantly between 2018 and 2021 in the Eastern Cape, KwaZulu Natal, Mpumalanga and Free State provinces.

Figure 6 presents the proportion of adults reporting that all learners in their households enrolled in grades 1 to 12 had returned to school (i.e. the household has a 100% “attendance rate”). Similar to *Figure 5*, the Free State shows the lowest rate of “full return” of learners within a household to school — approximately a quarter of adults in the Free State report at least one learner staying at home. This represents a 23 percentage-point decline from November 2020. The Eastern Cape and KwaZulu Natal provinces also display marginally significant ($p < 0.10$) declines in the proportions of adults reporting a 100% return of learners of 5-8 percentage points. Compared to historical benchmarks, the Free State, Eastern Cape, KwaZulu Natal and Mpumalanga provinces show significant deviations in April 2021 from 2018. We need to, however, remind readers that the NIDS (and by extension NIDS-CRAM) sample was not designed to be representative at the provincial level, and so we caution readers to make generalisations on provincial patterns based on these findings.

²⁵ November 25 2020, “Over 300 000 South African children may have dropped out of primary school during COVID-19”, accessed from Global Citizen, by Khanyi Mhlaba.

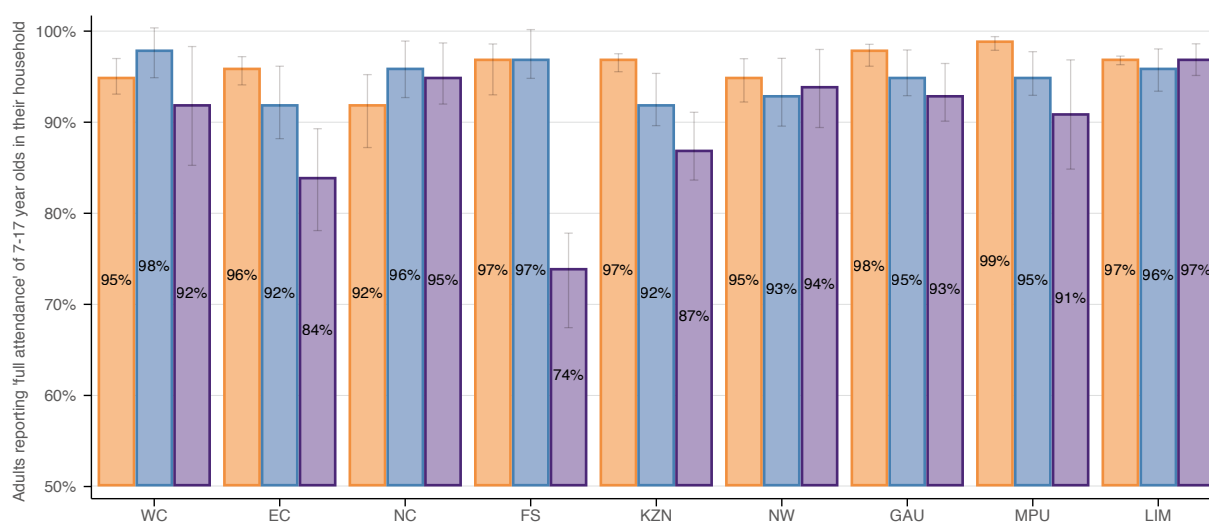
Figure 5: Average adult-reported household weekly attendance rates by province in 2018 (orange), July 2020 (green), November 2020 (blue) and April 2021 (purple)



Source: GHS (2018); NIDS-CRAM, Waves 2 and 3 (2020) and Wave 5 (2021).

Note: Attendance rates for July 2020 are computed for officially 'open' grades only. The unbalanced NIDS-CRAM panel is used. All data are weighted appropriately. 95% confidence intervals indicated.

Figure 6: Proportion of adults reporting the return to school of ALL children ('full attendance') in the household by province in 2018 (orange), November 2020 (blue) and April 2021 (purple)



Source: GHS (2018); NIDS-CRAM, Waves 3 (2020) and Wave 5 (2021).

Note: The unbalanced NIDS-CRAM panel is used. Data are weighted appropriately. 95% confidence intervals indicated.

3.3. School reopening

The DBE has issued a directive²⁶ announcing the full return to daily attendance and traditional timetabling for all Grade R to 7 learners from 26 July 2021 (the start of Term 3). The notice refers to all schools with specific mention of applicability to special need learners. The directive adopts a risk adjusted differentiated strategy allowing for more localised responses by districts and/or schools in line with the Department of Health processes for risk categorisation. As far as is possible, schools are encouraged to continue adhering to social distancing, as well as other standard operating procedures and regulations. Suggestions to address large class sizes include using the outdoors as teaching venues (where conducive for learning) as well as using all available rooms and spaces for teaching.

At the time of school reopening in July 2020, applications for deviation were required for opening more grades. In the most recent directive, it is those primary schools that will not be opening fully or returning to traditional timetabling that are required to secure formal approval for deviation from the Head of the province by 30 June 2021. The suspension of contact sports as announced on 27 May²⁷ is maintained, while non-contact sports, arts and cultural activities except choirs may resume.

The education sector stakeholders have a history of high engagement, and this has been particularly evident in the contestations on the closing and opening of schools. This has included court cases by political movements and unions, as well as political statements by School Governing Bodies (SGBs) amongst other, the details of which are discussed in Mohohlwane et al (2020). The most recent contestations have been from the Economic Freedom Fighters (EFF)²⁸ demanding that schools close contact-learning with immediate effect and threatening to intervene directly if this is not adhered to. In addition to official and public opposition, there was also at least one fake news announcement announcing school closure.²⁹ To date, however, no school closures have been implemented by the DBE or others. While contestation remains, civil society organisations such as Equal Education (EE) have supported the latest efforts on keeping schools open and returning to daily attendance. This position has also been supported by the Portfolio Committee of Basic Education in a 1 June 2021 meeting.³⁰

4. Learning losses

4.1. International evidence

Numerous studies conducted across the world have indicated quite clearly the significant negative impact that school closures have had on the learning levels of children. Recent simulations by the World Bank (Azevedo, 2020) on learning poverty — defined as the proportion of 10-year-olds that are unable to read and understand simple text — indicate that under conditions of 7 months of school closure, an additional 72 million primary-school-age children globally could have fallen into learning poverty. This represents a 20% increase on pre-pandemic numbers. Much of these increases are predicted to occur in regions already afflicted by high proportions of learning poor children, such as South Asia and Latin America. In Sub-Saharan Africa, a region with already widespread learning poverty, the depth (as opposed to breadth) of this learning poverty is expected to rise. Specifically, the Learning Deprivation Gap (i.e. the average distance of level of attained reading from the minimum proficiency level), usually 20% and equivalent to a full academic year of learning, is expected to increase by 2.5 percentage points, whilst the severity of this deprivation (i.e. inequality among learning deprived learners) is expected to increase by 1.5 percentage points.

26 Government Gazette No. 44633, 28 May 2021.

27 Department of Basic Education Circular No. 3 of 2021, dated 27 May 2021.

28 10 June SABC news EFF video and 16 June 2021 EFF Youth Day event accessed from EyeWitness News, by Xanderleigh Dookey Makhaz.

29 South African Government. Media Statement. Basic Education condemns fake news on school closure. 25 May 2021

30 Portfolio Committee on Basic Education. 1 June 2021. Status of School Preparedness for a possible Third Wave: DBE briefing; with Minister and Deputy Minister.

This method of measuring ‘learning poverty’ was applied by Reddy et al (2020)³¹ to the South African 2015 Trends in International Mathematics and Science Study (TIMSS) data to illustrate the potential trends—and not exact values—in learning losses across no-fee and fee-charging schools that might arise from the first few months of school closures in 2020. The results predict, in line with Azevedo (2020), a greater leftward shift of the learning curve in no-fee versus fee-charging schools, leading to a greater proportion of learning poor students amongst the former, as well as greater depth of learning poverty.

A field study of learning poverty was undertaken in the Indian context by the Azim Premji Foundation (2021).³² Performance in four specific abilities in language and mathematics that prove essential for subsequent learning were measured in March 2020 and again in January 2021. Approximately 16,000 learners enrolled in classes 2 to 6 across 44 districts in 5 states were assessed. Results showed that 92% of children had lost, on average, at least one specific language ability from the previous year, and 82% of children had lost, on average, at least one specific mathematical ability from the previous year.

Using existing evidence from prior out-of-school literature (i.e. summer learning loss and school closure due to natural disaster), Kuhfeld et al (2020)³³ show that, amongst students who did not receive remote instruction over the period during which schools were closed (approximately 60 school days), learning gains in reading would be 32-37% lower than a typical school year, and learning gains in mathematics 50-63% lower. Under a scenario of partial absenteeism (i.e. learners receiving approximately 50% of their typical instruction during school closures), typical learning gains would be 13-40% lower. Kaffenberger (2021)³⁴ similarly simulates learning losses for seven low- and middle-income countries, finding grade 3 learners affected by school closures that last approximately a third of a normal year will show a one-year deficit by grade 10.

The experiences of Western and Global North country contexts, for which a larger amount of timely and longitudinal data is available, do not always offer the best counterfactual for understanding the impact of crises on low and middle-income country (LMICs) contexts. However, under certain assumptions, comparative studies made with these contexts can still provide us with an indication of the potential impact. Reddy (2021)³⁵ makes use of findings from a Belgian longitudinal study (Maldonado and de Witte, 2020)³⁶ of grade 6 performance between 2015 and 2020 to estimate the likely impact of school closure on grade 9 performance in mathematics using South African learners’ performance in the 2019 TIMSS as a pre-pandemic benchmark. This comparison could be justified from the perspective that the average mathematics performance of South African grade 9 learners in TIMSS 2019 was 1.1-1.2 standard deviations below the average performance of the group of participating Northern European countries. Given that 1-year of learning is equivalent to roughly 0.4 standard deviations on the TIMSS scale, it can be argued that the average performance of a grade 9 learner in South Africa lags 3 years of learning behind (i.e. grade 6).

Maldonado and de Witte (2020) find a learning loss of 0.19 standard deviations in mathematics amongst the 2020 Belgian cohort. From this, Reddy extrapolates a learning loss between 2019 and 2020 of 0.25 standard deviations (63% of a year of learning) in no-fee schools, 0.19 standard deviations (48% of a year of learning) in fee-paying schools, and 0.21 standard deviations (53% of a year of learning) nationally. Reddy further shows that the predicted mathematics outcomes for 2020 are equivalent to those of TIMSS 2015. In other words, grade 9 performance has potentially regressed to 2015 levels.

31 Reddy, V., Soudien, C., & Winnaar, L. 2020. Disrupted learning during COVID-19: *The impact of school closures on education outcomes in South Africa*. Article available online (accessed 1 July 2021): <http://www.hsrc.ac.za/en/review/hsrc-review-july-2020/disrupted-learning-during-covid19>.

32 Azim Premji Foundation research group. 2021. Loss of learning during the pandemic. Accessed online 27 June 2021. <https://azimpremjiuniversity.edu.in/field-studies-in-education/loss-of-learning-during-the-pandemic>.

33 Kuhfeld, M., Soland, J., Tarasawa, B., Johnson, A., Ruzek, E., & Liu, J. 2020. Projecting the Potential Impact of COVID-19 School Closures on Academic Achievement. *Educational Researcher*, 49(8), 549-565.

34 Kaffenberger, M. 2021. Modeling the Long-Run Learning Impact of the COVID-19 Learning Shock: Actions to (More Than) Mitigate Loss. *International Journal of Educational Development* 81.

35 Reddy, V. (2021). In *Primary and Secondary Education during COVID-19: Disruptions to Educational Opportunity During a Pandemic* (Ed. Reimers, F.M.). Basingstoke: Springer Nature.

36 Maldonado, J.E., & de Witte, K. 2020. *The Effect of School Closures on Standardised Student Test Outcomes*. Department of Economics Discussion Paper Series, Discussion Paper DPS20.17, University of Leuven.

Adopting data from the World Bank's Learning Adjusted Years of Schooling (LAYS) and the Programme for International Student Assessment (PISA), Azevedo et al (2020) simulate the potential range of impacts of school closures on learning under several scenarios: An 'optimistic' scenario (3 months of school closure in a 10-month academic year with high mitigation measure effectiveness) predicts learning lost equivalent to 0.3 years of schooling, whilst 'intermediate' (5 months of school closure with medium mitigation measure effectiveness) and 'pessimistic' (7 months of school closure with low mitigation measure effectiveness) provide estimated learning losses equivalent to 0.6 and 0.9 years of school, respectively.

Most recently, Lichand et al (2021) exploited a 'natural' experiment in the state of São Paulo (Brazil) in which in-person classes were conducted in the first quarter (Q1) of 2020, followed by fully remote instruction for Q2 through Q4, yet all quarterly standardised exams were remote across all quarters. The risks to dropout and learning of remote learning are estimated using a differences-in-difference strategy comparing 2020 to 2019 when all classes and exams were in-person. They show dropout risk amongst learners in grades 6 to 12 to have increased by at least 300% across all grades, whilst learning losses indicate a setback of at least 60% relative to in-person learning; the estimated learning loss was, however, found to be as high as 100% in grade 11. These can be compared to World Bank (2021) estimates of learning loss in the LAC region using PISA scores that indicate 1.3 years of quality-adjusted years of schooling (LAYS) lost amongst lower secondary (grade 7 to 9) school learners for 10-months, or a full school year lost. Countries in the region with school closures extended to as much as 13 months are estimated to see losses of 1.7 LAYS.

4.2. Remote learning

The ability to take advantage of remote learning opportunities is one factor that can account for a rise in performance inequality within and across education systems. School systems in which the technical and institutional capacities to move to remote teaching were already in place were able to quickly adapt to the 'new normal'. For example, the national radio learning programme used by Sierra Leone during the Ebola crisis, and Kenya's radio and television learning channels that broadcast almost seven hours of Kenya Institute of Curriculum Development (KICD) content five days a week across 40 community radio stations and three national television channels.

However, other LMIC school systems with far less experience in remote learning faced the formidable challenge of quickly designing, implementing, and sustaining distance learning during periods of school closure. For example, Peru created their national multi-channel remote learning programme 'Aprendo en Casa' in less than two weeks (Cobo et al, 2020). Led by the Ministry for Communication and Digital Technologies, South Africa similarly responded by launching a multi-media 'COVID-19 Learner Support' initiative on 9 April 2020 that included the broadcasting of content across the three national SABC TV channels and 13 radio stations (with online support), as well as allocated dedicated education channels on the DSTV and OpenView broadcast satellite services (Mhlanga and Moloi, 2020)³⁷. Cellular service providers (MTN, Telkom, Vodacom and CellC) also declared certain websites and learning portals zero-rated (i.e. data free) so that learners could access a variety of learning content at low cost.

Table 5 summarises the provision of educational resources across television and radio channels. It is immediately evident that content made available on SABC channels were targeted at FET learners, and even then, for only 3.5 hours per day starting at 5am in the morning. Content for grade 1 to 9 learners could only be accessed on satellite services that were fortunately made freely available during lockdown. However, access to OpenView required users to have a television and an OpenView decoder and satellite, whilst DSTV could be accessed via a computer, tablet, or smartphone. Radio content was almost universally applicable to FET phase only, and no content (aside from podcasts) was scheduled to be broadcast on any Western Cape or Northern Cape channels. However, content was broadcast for 7 hours a day on an online radio channel, CAPS radio. Overall, Van der Berg and

³⁷ Mhlanga, D., & Tankiso, M. 2020. COVID-19 and the Digital Transformation of Education: What Are We Learning on 4IR in South Africa? *Education Sciences*, 10(7), 180.

Spaull (2020)³⁸ estimate that the instruction received by most learners through these media would have only been equivalent to about 5% of contact instructional time.

Therefore, access to content under conditions of remote learning in South Africa was heavily contingent on possessing the right technology with which to take advantage of the free services. According to the GHS 2018, 87.6% of households with children possessed a television, of which 50.5% also possessed paid-for satellite services. Therefore, around half of learners aged 7-17 are estimated to have had access to the dedicated learning channels indicated in column 2 of *Table 5*. However, close to 25% of school-going aged learners had access to neither a television nor a desktop/laptop computer, and only 8.5% of households with children had access to the internet. Furthermore, amongst those households without access to satellite television services, only 5.6% possessed a computer, 52.4% a cellphone and 49.6% a radio. This indicates significant cross-household variation in the type of technology available to children in a situation of remote learning. These figures align with those of Van der Berg and Spaull (2020), who estimate that at most 5-10% of learners in South Africa have a computer at home, and Gustafsson (2020)³⁹ who argues that only amongst the wealthiest 5% of schools do at least 90% of learners have access to a computer and the internet at home.

Table 5: Remote learning support during periods of school closure in South Africa

	SABC TV channels	Broadcast satellite services (DSTV and OpenView)	SABC radio
Description	Teachers delivering lessons live to learners		
Connectivity	Offline		
Platform	Television/desktop		Radio/desktop
Conditions of use	Free	Free (during lockdown), but watching OpenView required a decoder and satellite (DSTV could be streamed)	Free
Content for Foundation phase		Sat & Sun: 05:00-06:00 Mon - Sun: 06:00-21:00	
Content for Intermediate phase		Mon - Sun: 06:00-21:00	Mon-Thur: 17:30-18:00 (Gauteng only)
Content for Senior phase		Mon - Sun: 06:00-21:00	
Content for FET phase	Mon-Fri: 05:00-07:00, 09:30-11:00	Mon-Sun: 00:00-06:00, 11:00-23:00	Online: 18:00-0:00 Eastern Cape: 10:15-10:45 KwaZulu Natal: 09:00-16:30 Gauteng: 09:00-18:00 Mpumalanga: 13:00-18:00 Limpopo: 14:30-15:00, 17:30-18:00 Free State: 19:30-20:00 North West: 17:30-18:00, 19:30-20:00

Sources: adapted from Mhlanga and Moloi, 2020 (p.7); DBE TV, radio and online schedules (2020).⁴⁰

38 Van der Berg, S., & Spaull, N. 2020. *Counting the Cost: COVID-19 school closures in South Africa & its impacts on children*. Research on Socioeconomic Policy (RESEP) Working Paper. Stellenbosch: Stellenbosch University.

39 Gustafsson, M. 2020. *Basic education and the coronavirus*. Stellenbosch: University of Stellenbosch.

40 Accessed online 1 July 2020: <https://www.education.gov.za/covid19supportpackage.aspx>.

The NIDS-CRAM Wave 1 data collected in May/June 2020 asked adult respondents whether children in their household had accessed educational content on television, radio, or online. Almost two-thirds (64%) of adults responded that children had watched educational television in the 7 days prior to being interviewed, whilst 46% and 34% of adults reported that children had listened to educational radio and accessed educational content online, respectively. Roughly 17% of respondents reported that children had made no use of any of these media over the past 7 days. Reported use of online and radio educational content are significantly related to household poverty (proxied by running out of food in the previous month): Significantly higher proportions of children in non-poor (food secure) households accessed online content, whilst significantly higher proportions of children in poor (food insecure) households accessed radio content.

Ngware (2020)⁴¹ makes the case that while the COVID-19 school closures have created an increased appetite for innovation, a systematic and sustainable approach needs to be followed to really leverage ICTs for education in Africa. A study by Angrist et al (2020)⁴² indicates how low-tech interventions that are cheap and scalable can be used as substitutes for in-person instruction. Conducted in Botswana, the study highlights the importance of providing solutions to remote learning that not only circumvent the issue of varied access to certain technology, but also empower parents to educate their children. A sample of 4,500 households with primary-school aged children were sampled and assigned to one of three groups: a treatment that involved receiving SMS text messages that provided several numeracy “problems of the week”; a treatment that provided parents with 15–20-minute phone calls with instructors that led them through learning activities sent via text message; and a control group. They estimated that, relative to the control group, the combined phone and text SMS treatment contributed to a 52% reduction in the share of students unable to do any numerical operations on an Annual Status of Education Report (ASER) basic numeracy test, and a gain in numerical skill of 0.29 standard deviations. Amongst students who were part of the text message only treatment, reduction in numerical poverty was 34%, and the skills gain 0.16 standard deviations. The important thing to note is that these results were obtained without the need for internet access and using a technology that almost all (90%) of South African adults living with children possess.

4.3. Update on our previous estimates

The above evidence illustrates, importantly, that learning losses exceed the number of lost schooling days lost. This is because learning is not linear, but learners ‘forget’, or do not immediately fully comprehend, everything that is taught to them, even when schooling is uninterrupted. Using the World Bank model for calculating learning loss, Gustafsson and Nuga Deliwe (2020)⁴³ propose a learning loss ratio of 1:1.25 for South Africa; that is, for every 1 day that learners are not in school, learning losses are 1.25 of a day. In a 2021 updated estimate using UNESCO data, Gustafsson (2021) proposes a 1:2 ratio, a significantly higher estimate than previously thought.

Our previous analyses of the Early Grade Reading Study (EGRS) (Shepherd et al, 2021) and Funda Wande (FW) data (Ardington, 2021)⁴⁴ showed similar, and potentially slightly higher, learning losses as those of Azevedo et al (2020) and Lichand et al (2021) amongst no-fee schools in South Africa. Comparisons of learning gains over a year of schooling in the EGRS II study to those estimated in similar studies—namely, the EGRS I (2019) and Story Powered Schools (SPS) (2019)—in pre-pandemic times found evidence of learning losses equivalent to 50-75% of a year of learning. This was calculated after an estimated 120 school days lost amongst grade 1 to grade 5 learners on average.

41 April 19, 2020, in The Conversation. Delivering education online: coronavirus underscores what’s missing in Africa. Accessed 28 June 2021: <https://theconversation.com/delivering-education-online-coronavirus-underscores-whats-missing-in-africa-134914>

42 Angrist, N., Bergman, P., Brewster, C., & Matsheng, M. 2020. *Stemming Learning Loss During the Pandemic: A Rapid Randomized Trial of a Low-Tech Intervention in Botswana*. Centre for the Study of African Economics Working Paper 2020-13.

43 Gustafsson, M. and Nuga Deliwe, C. 2020. *How is the COVID-19 pandemic affecting educational quality in South Africa? Evidence to date and future risks*. NIDS-CRAM Insight Brief I.

44 Ardington, C. 2021. COVID learning losses: Early grade reading in South Africa. South Africa Labour and Development Research Unit report prepared for Funda Wande.

Given that rotational timetables adopted by schools in 2020 have continued to be implemented up until June 2021, we can calculate the projected learning losses from March 2020 to the end of June 2021. In total, 93 days of schooling would have occurred between 15 February 2021 (the start of the 2021 academic year) and 30 June 2021. Assuming a rotational timetable that allows for learners to be in contact learning for 50% of this time, our best estimates suggest that most primary school children have lost between 70% to a full year of learning. This estimate is in line with the most recent, simulation-based evidence for LAC countries (as discussed above).

However, the international evidence provided above points towards additional effects of ‘forgetting’ or regression that could hinder current learning to the point where the proportion of learners failing to meet minimum proficiency benchmarks, as well as the average distance of proficiency attained from this benchmark, are likely to increase. Therefore, assuming a return to complete school opening and contact learning amongst primary school learners from July 2021, cumulative learning losses could exceed a full year of learning as learners move through the school system, particularly if teaching occurs as if the content of the previous year’s curriculum has been mastered, let alone learnt. Gustafsson and Nuga Deliwe (2020), for example, model learning losses for South Africa under different scenarios for catching up lost learning. Assuming that the schooling system is unable to successfully catch up to pre-pandemic trajectories, they predict grade 12 outcomes to be lower than expected until 2032.

It is worth mentioning, then, that certain curriculum adjustments⁴⁵ were introduced in 2020 in response to the reduced school year. These included reducing core content and skills to emphasise the fundamentals for each subject and grade. For example, the time previously allocated to Life Skills in the Foundation Phase was reallocated to Home Language, English as a First Additional Language and Numeracy. Teachers were encouraged to integrate themes from Life Skills into the remaining subjects; such a feat might only be possible depending on the ability and skills of teachers. In the Senior Phase (grades 7 to 9), schools were permitted to reduce their subject offering from nine subjects to seven. The subjects that could be dropped included Economic and Management Sciences, Technology, Social Sciences and/or Creative Arts. While a debate on the merits of these subjects is beyond the scope of this paper, these changes are certain to have implications for future career opportunities. The NEEDU report (2021) also highlighted various misinterpretations of these rules, with some schools dropping compulsory subjects such as languages. In addition, given the reduced attendance of learners, the depth of coverage even within the reduced curriculum is not clear.

5. Caregiver worry, household economic strain and hunger

Schools serve as important components of any community’s infrastructure: Aside from education, they provide critical services (e.g. school meal programs and counselling) that assist in mitigating health disparities (Gilbert et al., 2020; Van Lancker and Parolin, 2020).⁴⁶ Therefore, we would expect some movement of households in and out of food insecurity at times of lengthened school closure, such as school holidays. The disruptions caused by COVID-19 in the delivery of these services have the potential to exacerbate already existent socio-economic (and racial) inequalities as a result of, amongst other factors: a lack of resources for effective remote learning (i.e. books, access to radio and/or television for public broadcasting, and access to the internet) amongst the most socioeconomically disadvantaged (Van Lancker and Parolin, 2020); lower support for home learning from the schools predominantly attended by poorer learners; and the compounding challenges

⁴⁵ Circular S3 of 2020.

⁴⁶ Gilbert, L.K., Strine, T.W., ..., Ko, J.Y. (2020). Racial and ethnic differences in parental attitudes and concerns about school reopening during the COVID-19 pandemic – United States, July 2020. *MMWR Morbidity and Mortality Weekly Report* 69(49): 1848-1852.
Van Lancker, W. and Parolin, Z. (2020). COVID-19, school closures, and child poverty: a social crisis in the making. *Lancet Public Health* 5(5): E243-E244.

of financial strain, job loss/inflexibility and safety experienced by their parents (Cluver, Lachman, Sherr, et al., 2020; van Doorn, Cooney and Sabin, 2020; Armitage and Nellums, 2020; Casale and Shepherd, 2020).⁴⁷

The closing and reopening of schools during the current pandemic, particularly prior to widespread availability of a COVID-19 vaccine, is expected to cause some anxiety and raise concerns in households with children. As argued by Gilbert and colleagues (2020): “Understanding parental attitudes and concerns is [not only] critical to informing communication and messaging around COVID-19 mitigation... [but] also highlight the need for flexible education plans and equitable resource provision so that youth education is not compromised” (p1848).

In July 2020—when South Africa was in a Level 3 national lockdown and only grades 6, 7, 11 and 12 were (officially) attending school—close to 75% of adults living with children expressed being very worried about the return of learners to school during the COVID-19 pandemic (see *Figure 7* below). In November/December 2020, when Level 1 lockdown was in effect and learners of all grades were permitted to attend school (albeit on a rotational basis), levels of high concern had fallen by approximately 20 percentage-points (30%). Data collected in February 2021 indicated that levels of high worry about learners’ return had increased by approximately 6-percentage points between Waves 3 and 4 (significant at the 10% level). Separating out the roughly 62% and 38% of Wave 4 respondents (living with children) that were interviewed before and after the official reopening of schools, respectively, we find that 59.3% of adults in the former group were very worried about learner return, compared to 52% amongst the latter. By April 2021, levels of worry had dropped to 45%, representing a significant decline from all previous waves.

Figure 7: Estimated level of ‘high worry’ of school return during a pandemic, July 2020 – May 2021



Source: NIDS-CRAM, Waves 2 and 3 (2020) and Waves 4 and 5 (2021)

Notes: The sample is all adult respondents who reported to live with at least one child (<=17 years of age) at the time of interview. The unbalanced panel is used and data are weighted appropriately. 95 percent confidence intervals are shown.

5.1. Dynamics in caregiver worry

Prior experiences of a particular event contribute to a higher propensity of engaging in that same event in the future (Honoré and Kyriazidou, 2000). Just more than 50% of adults living with children who expressed being very worried about school return in July 2020 expressed similar worry almost a year later in April/May 2021. Similarly, 83% of adults living with children who expressed being little or not worried in July 2020 expressed the same in April/May 2021. This suggests some consistency in attitudes/opinions over time. As indicated in Shepherd, Mohohlwane, Taylor and Kotzé (2021),

⁴⁷ Cluver, L., Lachman, J.M., Sherr, L., Wessels, I., Krug, E., Rakotomalala, S., et al. (2020). Parenting in a time of COVID-19. *Lancet Correspondence* 395(10231): E64
 van Doorn, A., Cooney, R.E. and Sabin, M.L. (2020). COVID-19 exacerbating inequalities in the US. *Lancet Correspondence* 395(10232): E1243-E1244.
 Armitage, R. and Nellums, L.B. (2020). COVID-19 and the consequences of isolating the elderly. *Lancet Public Health* 5(5): E256.
 Casale, D. and Shepherd, D. (2020). The gendered effects of the ongoing lockdown and school closures in South Africa: Evidence from NIDS-CRAM Waves 1 and 2.

the majority of respondents within each starting state report the same level of concern at each consecutive round of surveying.

Given this serial persistence over time, a dynamic nonlinear panel data model emerges as the most suitable for modelling attitudes over time. Specifically, a naive dynamic model of caregiver worry is represented by:

$$y_{it}^* = \gamma Z_{it} + \beta X_{it} + \rho y_{i,t-1} + c_i + u_{it} \quad [1]$$

where y_{it}^* is the latent outcome expressing the likelihood that respondent i reports being very worried about learners in the household returning to school during a pandemic at time t . Z represents a set of strictly exogenous time-varying covariates—marital status, employment status, household SES¹² and composition,¹³ area of residence (rural versus urban), household food security,¹⁴ access to school meals, perceptions of risk around contracting COVID-19,¹⁵ and depressed mood¹⁶—, X represents a set of time invariant covariates—sex, level of education, age, and race—, $y_{i,t-1}$ the lagged response, c_i the unobserved individual effect $\sim N(0, \omega)$, and u_{it} the idiosyncratic error term. The model represented by [1], therefore, ignores the initial response, y_{i0} , and assumes this to be independent of c_i .

Estimating a model of this kind assumes distinguishing the “true” (or “genuine” state dependence from that which is “spurious”. A spurious state dependence may arise if the characteristics correlated with caregiver worry are not adequately controlled for or the initial conditions and/or relevant presample history of the attitudes process are not taken into account (Heckman, 1981). That is, y_{i0} is affected by c_i and the presample response $y_{-1,i}$, which is missing. The initial conditions problem implies that the coefficient on $y_{i,t-1}$ will likely be overestimated, and the variance of c_i and the coefficients of covariates correlated with $y_{i,t-1}$ underestimated (in absolute value). This is more likely to be true in short panels (Fotouhi, 2005; Arulampalam and Stewart, 2009; Akay, 2012)⁴⁸.

This problem is tackled either through modeling y_{i0} jointly with the subsequent responses (Heckman, 1981)⁴⁹, or (more simply) conditioning on y_{i0} (Wooldridge, 2005)⁵⁰. This paper adopts the second of these approaches. Following Rabe-Hesketh and Skrondal (2013)⁵¹, an auxiliary model for c_i is written as:

$$c_i = \alpha_0 + \alpha_1 y_{i0} + \alpha_2 X_{it} + \alpha_3 \bar{Z}_{it} + \alpha_4 Z_{i0} + a_i \quad [2]$$

where $a_i \sim N(0, \varphi)$, assumed independent of y_{i0} , X_{it} , Z_{i0} , the initial values of the time-varying covariates, and $\bar{Z}_{it}$ which stands for the within-individual averages that are generated from all periods $t = 0, \dots, N$. The full model,

$$y_{it}^* = \gamma Z_{it} + \pi X_{it} + \rho y_{i,t-1} \alpha_0 + \alpha_1 y_{i0} + \alpha_3 \bar{Z}_{it} + \alpha_4 Z_{i0} + a_i + u_{it} \quad [3]$$

therefore, allows for the coefficients of the initial values Z_{i0} to be different from the coefficients for subsequent periods. The inclusion of $\bar{Z}$ accommodates level-2 endogeneity (between-subject confounding) due to correlations between unobserved time constant factors and model covariates. This model also has the advantage that it can be used with incomplete cases. However, there could still be within-respondent confounding (level-1 endogeneity) due to an association between

48 Fotouhi, A. R. (2005) The initial conditions problem in longitudinal binary process: a simulation study. *Simulation Modelling Practice and Theory*, 13, 566–583.

Arulampalam, W. & Stewart, M. B. (2009) Simplified implementation of the Heckman estimator of the dynamic probit model and a comparison with alternative estimators. *Oxford Bulletin of Economic and Statistics*, 71, 659–681.

Akay, A. (2012) Finite-sample comparison of alternative methods for estimating dynamic panel data models. *Journal of Applied Econometrics*, 27, 1189–1204.

49 Heckman, J. J. 1981. The incidental parameters problem and the problem of initial conditions in estimating a discrete time - discrete data stochastic process. In *Structural Analysis of Discrete Data with Econometric Applications* (eds C. F. Manski and D. L. McFadden), pp. 179–195. Cambridge: MIT Press.

50 Wooldridge, J. M. 2005. Simple solutions to the initial conditions problem in dynamic, nonlinear panel data models with unobserved heterogeneity. *Journal of Applied Econometrics*, 20, 39–54.

51 Rabe-Hesketh, S. & Skrondal, A. 2014. Handling initial conditions and endogenous covariates in dynamic/transition models for binary data with unobserved heterogeneity. *Applied Statistics*, 63(2), 211–237.

unobserved time-varying factors (captured in u_{it}) and the model covariates, as well as issues of reverse causality. These issues could be resolved using suitable instrumental variables. However, given the limited number of question items in the NIDS-CRAM surveys, no instrumental variables are available.

Columns (1) and (2) of *Table 6* indicate the results of estimating the naïve model indicated in [1], where (2) further includes depressed mood as a covariate. Columns (3) and (4), then, present the estimates from a conditional model described by [3]. All models make use of the balanced panel of respondents (living with children), and the complex design of the NIDS-CRAM survey is taken into account. The results show clear evidence in favour of initial condition endogeneity, as indicated by a significant coefficient on y_{i0} , as well as an overestimated ρ and underestimated $var(c_i)$ in the naïve model (1). Furthermore, the statistically insignificant coefficient of 0.098 on $y_{i,t-1}$ in model (3) indicates no genuine state dependence when all four waves of data are taken into account. However, the converse is true when Wave 4 is excluded (column (4)).

This can be linked to differences in school closure/opening and the national lockdown level in effect at the time of data collection. Waves 2 and 4 correspond to a stricter lockdown level 3 (linked to the first and second infection waves), whilst waves 3 and 5 correspond to a less stringent lockdown level 1 when COVID-19 infection and spread was low. Furthermore, the majority of children were not attending school at the time of waves 2 and 4; this was due to phased in grade attendance over June to August 2020, whilst the collection of Wave 4 data corresponded with school holidays.⁵² It comes as no surprise that, conditional on initial responses, there would be significant state dependence between waves 3 and 5: those who were very worried at a time of low infection and COVID-19 spread are significantly more likely to again be very worried under similar conditions. However, the lack of state dependence when Wave 4 is included indicates that attitudes may be significantly affected by changing information and conditions.

Despite these differences in state dependence between models (3) and (4), the estimated relationships between the model covariates and the probability of a caregiver being very worried are similar. Age is indicated to hold a concave increasing relationship, whilst gender, level of education and household composition factors are not significantly related to the probability of being very worried. Respondents living in households that receive income through government grants and perceive themselves to be at risk of getting COVID-19 are significantly more likely to be very worried, whereas respondents who reported that children in their household recently received food at school are significantly less likely to be very worried.

A test of level-2 endogeneity indicates that certain of the coefficients are significantly different from zero. Bell et al (2019)⁵³ define these as “contextual effects” which can be distinguished from “within effects”—for example, can we determine whether the effect of an increase in household size from one period to the next is different from the effect of being a larger than average household over all periods. Estimates indicate factors of household composition, the receipt of government grants and depressed mood to be level-2 endogenous. Specifically, individuals with higher levels of depressed mood over the course of July 2020 to March/April 2021 are more likely to be very worried, as to are respondents living in larger households, especially with greater numbers of adults. Respondents living in households that received government grants and located in urban areas for most of the period are significantly less likely to be very worried.

Models (5) - (7) further investigate whether the extent of state dependence varies according to certain covariates. The results indicate state dependence to not be related to gender, but is significantly higher at times of stricter lockdown, and significantly lower amongst employed individuals.

⁵² About a third of wave 4 data occurred at a time when schools were open for the 2021 academic year.

⁵³ Bell, A., Fairbrother, M., & Jones, K. 2019. Fixed and random effects models: making an informed choice. *Quality & Quantity*, 53(2), 1051-1074.

Table 6: Dynamic probit regression results

	Naive model		Conditional model				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sample	Waves 2, 3, 4, 5	Waves, 2, 3, and 5	Waves, 2, 3, 4, 5	Waves, 2, 3, and 5	Waves, 2, 3, 4, 5	Waves, 2, 3, 4, 5	Waves, 2, 3, 4, 5
High worry _{t-1}	0.742*** (0.130)	1.032*** (0.106)	0.098 (0.137)	0.763*** (0.126)	0.079 (0.140)	0.115 (0.173)	0.228 (0.149)
High worry _{t-1} x Lockdown level 3					0.230* (0.135)		
High worry _{t-1} x Female						-0.030 (0.172)	
High worry _{t-1} x Employed							-0.270* (0.161)
Coloured	-0.323** (0.159)	-0.271 (0.239)	-0.446** (0.217)	-0.336 (0.232)	-0.431** (0.209)	-0.447** (0.218)	-0.447** (0.221)
Indian/Asian	-0.481** (0.242)	-0.131 (0.195)	-0.688** (0.280)	-0.342* (0.187)	-0.680** (0.274)	-0.686** (0.278)	-0.701** (0.293)
White	-0.655*** (0.217)	-0.955*** (0.262)	-0.766*** (0.245)	-0.985*** (0.254)	-0.736*** (0.241)	-0.765*** (0.245)	-0.785*** (0.250)
Age	0.020* (0.010)	0.036** (0.016)	0.045*** (0.017)	0.047*** (0.019)	0.043** (0.016)	0.045*** (0.017)	0.044*** (0.017)
Age squared	-0.000** (0.000)	-0.000** (0.000)	-0.000*** (0.000)	-0.001** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000** (0.000)
Female	-0.030 (0.066)	-0.062 (0.100)	-0.098 (0.089)	-0.073 (0.100)	-0.090 (0.084)	-0.080 (0.132)	-0.105 (0.089)
Incomplete secondary	0.049 (0.091)	0.033 (0.131)	0.231* (0.133)	0.204 (0.141)	0.218* (0.128)	0.232* (0.133)	0.238* (0.134)
Matric or equivalent	0.049 (0.091)	-0.101 (0.131)	0.093 (0.173)	0.077 (0.189)	0.087 (0.166)	0.093 (0.173)	0.102 (0.173)
Tertiary education	-0.052 (0.124)	-0.108 (0.191)	0.124 (0.174)	0.136 (0.195)	0.119 (0.167)	0.124 (0.174)	0.133 (0.175)
Urban	-0.007 (0.068)	0.010 (0.085)	0.874* (0.449)	0.980* (0.501)	0.865* (0.442)	0.875* (0.450)	0.857* (0.453)
Spouse/partner	-0.120* (0.063)	-0.083 (0.099)	0.077 (0.199)	0.130 (0.248)	0.089 (0.197)	0.077 (0.199)	0.072 (0.199)
Household size	0.052*** (0.019)	0.081*** (0.026)	0.005 (0.046)	-0.050 (0.049)	0.004 (0.047)	0.005 (0.046)	0.008 (0.047)
Number of children	-0.032 (0.031)	-0.048 (0.042)	0.014 (0.061)	0.108 (0.073)	0.018 (0.060)	0.013 (0.061)	0.011 (0.061)
Number of pensioners (excluding self)	-0.034 (0.067)	-0.024 (0.042)	0.137 (0.187)	-0.244 (0.212)	-0.154 (0.190)	-0.138 (0.187)	-0.147 (0.188)
Live in house/flat	-0.146* (0.074)	-0.200** (0.101)	0.107 (0.497)	0.496 (0.518)	0.168 (0.482)	0.105 (0.494)	0.134 (0.501)
Employed	0.043 (0.086)	-0.028 (0.108)	0.206 (0.161)	0.065 (0.162)	0.208 (0.162)	0.206 (0.161)	0.379** (0.177)

Household receives income from employment/business	-0.092 (0.094)	-0.178* (0.105)	-0.042 (0.165)	-0.182 (0.140)	-0.039 (0.166)	-0.042 (0.164)	-0.044 (0.163)
Household receives income from government grants	0.149** (0.070)	0.103 (0.088)	0.301** (0.123)	0.270** (0.137)	0.294** (0.121)	0.301** (0.123)	0.296** (0.121)
Believe oneself to be at risk of getting COVID-19	0.327*** (0.076)	0.418*** (0.107)	0.358*** (0.142)	0.441*** (0.178)	0.345*** (0.139)	0.358*** (0.142)	0.359*** (0.142)
Believe that you cannot avoid getting COVID-19	-0.025 (0.108)	-0.110 (0.140)	0.055 (0.186)	0.001 (0.183)	0.074 (0.185)	0.055 (0.046)	0.008 (0.047)
Depressed mood		0.055 (0.102)		-0.162 (0.157)			
Household ran out of money to buy food last month	0.337*** (0.089)	0.268** (0.086)	0.252 (0.176)	0.290* (0.161)	0.246 (0.171)	0.252 (0.176)	0.248 (0.174)
Member/s of the household experienced hunger in past 7 days	0.107 (0.160)	0.127 (0.172)	0.054 (0.267)	0.113 (0.262)	0.027 (0.269)	0.053 (0.267)	0.059 (0.263)
Child/ren in the household experienced hunger in past 7 days	0.142 (0.152)	0.225 (0.180)	0.074 (0.222)	0.182 (0.232)	0.095 (0.225)	0.076 (0.221)	0.060 (0.219)
Household received food and/or shelter from govt/NGO/ community	0.085 (0.109)	0.078 (0.134)	0.098 (0.161)	-0.011 (0.199)	0.099 (0.160)	0.096 (0.159)	0.112 (0.161)
Child/ren received food at school in past 7 days	-0.261*** (0.061)	-0.126 (0.086)	-0.365*** (0.084)	-0.275** (0.132)	-0.294*** (0.098)	-0.365*** (0.084)	-0.367*** (0.086)
High worry0			1.060*** (0.142)	0.560*** (0.127)	1.020*** (0.141)	1.061*** (0.143)	1.067*** (0.140)
F-statistic from test of level-2 endogeneity			1.36	1.86**	1.37	1.37	1.34
$sd(c_i)$	0.156	0.412***					
$sd(a_i)$			0.676***	0.421***	0.589***	0.677***	0.684***
NT	6 032	3 914	5 324	3 346	5 907	5 907	5 907
NT	2 370	2 317	2 099	1 974			
$F stat$	13.81***	7.51***	6.51***	4.10***	8.35***	7.12***	7.15***

5.2. Caregiver worry and economic hardship

The finding that changes in parental and caregiver worry is significantly related to economic hardship and hunger can be accounted for by the Family Stress Model (FSM) framework (Conger and Conger, 2002; Conger et al, 2002)⁵⁴. Specifically, hardships can lead to financial strain that forces households to confront economic pressures, including an inability to fulfil basic needs of food and shelter. This can lead to adverse mental health outcomes and stress for parents. The absence of various resources, such as food and adequate nutrition, can exacerbate the relationships between economic hardship and household strain, and household strain and parental stress (Masarik and Conger, 2017).⁵⁵

In the first few months of the COVID-19 pandemic in South Africa, an estimated 3 million jobs were shed—disproportionately concentrated amongst already disadvantaged groups (e.g. women, black African, young, less-educated)—with 1 in 3 income earners in February earning no income in April 2020 (Spaull et al, 2020). This is likely to have had disastrous effects for economic hardship. Köhler and Bhorat (2020)⁵⁶, for example, show that many of the special COVID-19 Social Relief of Distress Grant (SRDG), of which the majority were in low-income households, were previously in the middle of the household income distribution pre-crisis. Furthermore, nearly 6.5 million individuals who were eligible for the SRDG reported that they had not received it by July 2020; almost half of these were living in the poorest third of households.

The almost immediate impact of COVID-19 on economic hardship is reflected in almost half of adults in April 2020 reporting that their household had run out of money for food in the month prior (Van der Berg et al, 2020; see *Figure 8* below). Although subsequent waves of NIDS-CRAM have since shown a rise in jobs, women's job recovery has been slower than men's; the former tend to live in significantly larger households with more children (Harrichurran, Vermaak and Muller, 2021).⁵⁷ Additionally, although food security measured by a household's ability to afford food has improved since April 2020, the proportion of adults living with children who report household and child hunger has remained relatively stable since November 2020, and nearly twice the pre-pandemic level of 8% (GHS, 2018). Applying the NIDS-CRAM weights, the data estimates that just over 3 million adults reported their households to experience both adult and child hunger in April 2021; these households are estimated to have on average three children as members.

54 Conger, R.D., & Conger, K.J. 2002. Resilience in midwestern families: Selected findings from the first decade of a prospective, longitudinal study. *Journal of Marriage and Family*, 64, 361–373.

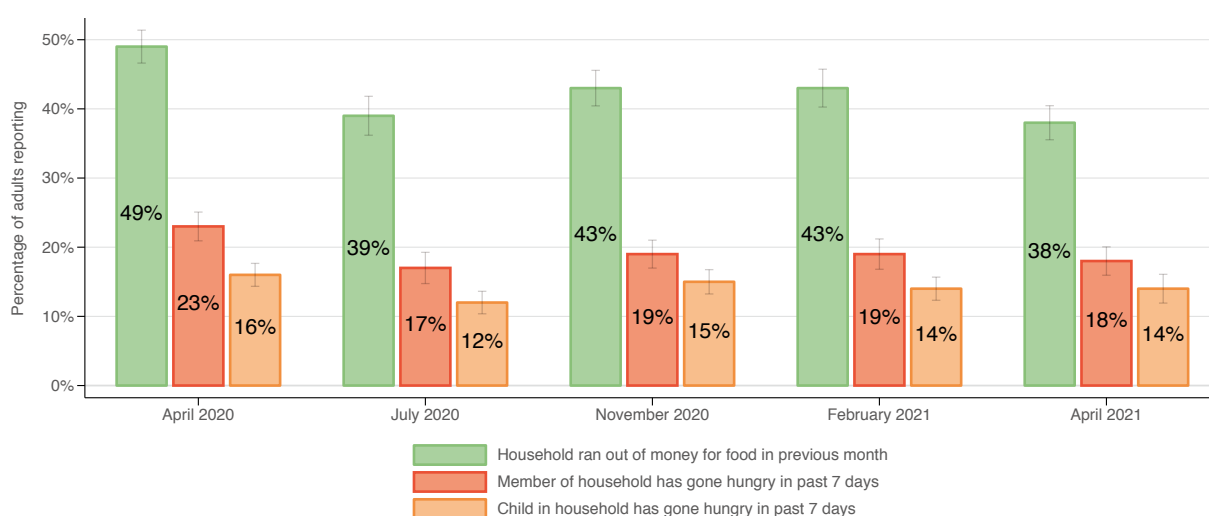
Conger, R.D., Wallace, L.E., Sun, Y., Simons, R.L., McLoyd, V.C., & Brody, G.H. 2002. Economic pressure in African American families: A replication and extension of the family stress model. *Developmental Psychology*, 38, 179–193.

55 Masarik, A.S., & Conger, R.D. 2017. Stress and child development: A review of the family stress model. *Current Opinions in Psychology*, 13, 85–90.

56 Bhorat, H., & Köhler, T. 2020. Social Assistance during South Africa's National Lockdown: Examining the COVID-19 Grant, Changes to the Child Support Grant, and Post-October Policy Options. DPRU working paper.

57 Harrichurran, P., Vermaak, C. & Muller, C. 2021. *The influence of household composition on leisure time in South Africa: A gender comparison*. WIDER Working Paper 2021/29. Helsinki: UNU-WIDER.

Figure 8: Rates of household food insecurity amongst households with children, July 2020 to April 2021



Source: NIDS-CRAM, Waves 1, 2 and 3 (2020) and Waves 4 and 5 (2021)

Notes: The sample is all adult respondents who reported to live with at least one child (≤ 17 years of age) at the time of interview. The unbalanced panel is used and data are weighted appropriately. 95 percent confidence intervals are shown.

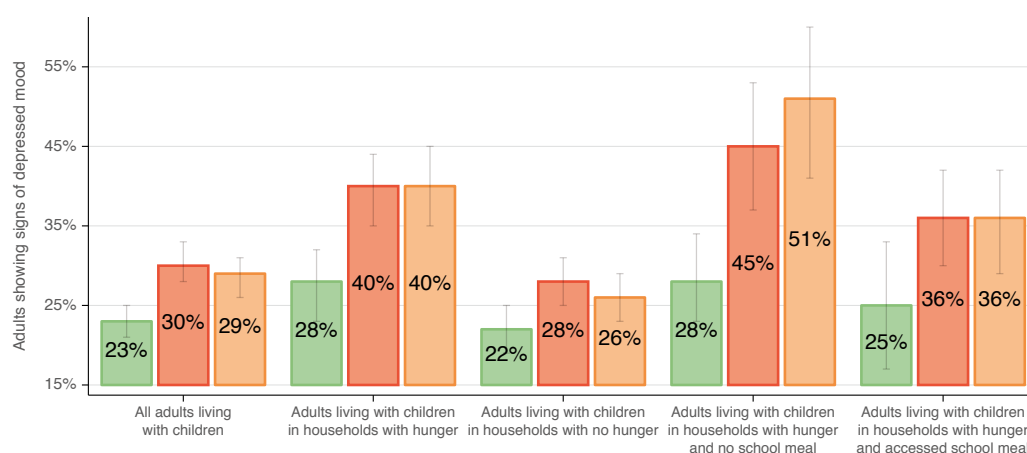
As mentioned above, the FSM model predicts that food insecurity will have an impact on the mental health of parents (Gershoff et al, 2019)⁵⁸; that is, parental stress, anxiety and depression can be intensified by a sense of inadequacy of being unable to provide food for their families (Huang et al, 2010; Whitaker et al, 2006; Melchior et al, 2009; Huang et al, 2010; Gee and Asim, 2019). Oyenubi and Kollamparabil (2020)⁵⁹ estimated the prevalence of depressed mood amongst adults to have doubled between 2017 and June 2020. Additionally, those reporting perpetual hunger (i.e. every day or almost every day) were twice as likely to show depressed mood (44%) when compared to adults reporting hunger 1-2 days a week or not at all (23%).

Figure 9 below indicates a significant rise in the proportion of adults reporting a depressed mood since July 2020; in November 2020 and April 2021, a depressed mood is estimated for roughly 1 in 3 adults living with children. A significantly higher prevalence of depressed mood is evidence amongst adults living with children who report household hunger when compared to those living in households with no incidences of hunger. Since November 2020, almost 1 in 2 adults living in food insecure households in which children also reside are estimated to have a depressed mood. Notable differences also emerge by whether children in the home have had recent access to a school meal: Half of the adult caregivers of children living in food insecure homes in which learners have not had a recent meal at school are indicated to have a depressed mood in April 2021. This is compared to a significantly lower ($p < 0.10$) prevalence amongst adult caregivers in food insecure households in which learners had received food at school.

⁵⁸ Gershoff, E.T., Aber, J.L., Raver, C.C., & Lennon, M.C. 2019. Income is not enough: Incorporating material hardship into models of income associations with parenting and child development. *Child Development*, 78, 70–95.

⁵⁹ Oyenubi, A., & Kollamparabil, U. 2020. COVID-19 and Depressive symptoms in South Africa.

Figure 9: Rate of adult depressive mood by household food insecurity in July 2020 (green), November 2020 (red) and April 2021 (orange)



Source: NIDS-CRAM, Waves 2 and 3 (2020) and Wave 5 (2021)

Notes: The sample is all adult respondents who reported to live with at least one child (<=17 years of age) at the time of interview. The unbalanced panel is used, and data are weighted appropriately. 95 percent confidence intervals are shown.

5.3. School feeding

According to the United Nations World Food Programme, 154 million children globally missed meals as a result of COVID-19 related school closures. Responses from 52 out of 79 countries mentioned the provision of food parcels as a strategy for dealing with this issue, while a further 13 countries have adopted a cash-transfer modality.

School feeding, or rather the lack thereof, can have a considerable impact on parental stress. Existing research on “holiday hunger” in the United Kingdom, for example, has shown a rise in emotional stress amongst parents in low-income households (Gooseman et al, 2019; Graham et al, 2016; Stretesky et al, 2020)⁶⁰. In the United States, five major US Department of Agriculture (USDA) programmes were aimed at alleviating child hunger before the pandemic, three of which supported meals provided in schools, namely: the National School Lunch Program (NSLP), the School Breakfast Program (SBP), and the Child and Adult Care Food Program (CACFP). More than 30 million children lost access to meals during periods of school closure and hybrid learning.

The National School Nutrition Programme (NSNP) is one of the strategic ongoing safety nets that were introduced in South Africa more than 20 years ago, providing daily meals to more than 10 million learners. Beneficiaries from the NSNP programme increased from 70% in 2010 to 82% in 2018.⁶¹ While this is above the number of no-fee schools, it is in line with the persistent ‘food poverty line’ that has remained constant since 2011. The NSNP target for 2020/21 is to provide meals to 21,000 schools reaching 10,707,186 learners out of the school population of 13,041,198.⁶² Targeting of the programme is pro-poor: According to the 2018 General Household Survey (GHS), 80% of learners aged 7 to 17 years living in the poorest 40% of households (according to per capita income) received food through a school feeding/nutrition programme daily. This is compared to 18% of children amongst the wealthiest 20% of households.

School feeding typically operates during the school term, and therefore we would expect some

⁶⁰ Gooseman, A., Defeyter, M.A., & Graham, P.L. 2019. Hunger in the primary school setting: Evidence, impacts and solutions according to school staff in the North East of England, UK solutions according to school staff in the North East of England, UK. *International Journal of Primary and Elementary Early Years Education*, 3, 1–13

Graham, P.L., Crilley, E., Stretesky, P.B., Long, M.A., Palmer, K.J., Steinbock, E., & Defeyter, M.A. 2016. School holiday food provision in the UK: A qualitative investigation of needs, benefits, and potential for development. *Frontiers in Public Health*, 4, 172.

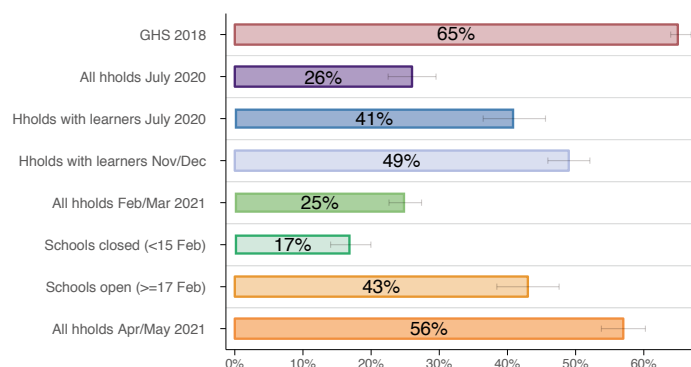
Stretesky, P.B., Defeyter, M.A., Long, M.A., Ritchie, L.A., & Gill, D.A. 2020. Holiday Hunger and Parental Stress: Evidence from North East England. *Sustainability*, 12(10):4141

⁶¹ Department of Basic Education. March 2021. Annual Performance Plan 2021/22

⁶² Department of Basic Education. January 2020. School Realities 2019

seasonal movement in and out of food security. However, the suspension of the National Schools Nutrition Programme (NSNP) for four months from March to June 2020 represents the longest break in the provision of daily meals to eligible learners, producing additional emotional strain for caregivers. Earlier analyses of the NIDS-CRAM data illustrated that a mere 26% of adults reported that children in their household had received school meals in July 2020 (Mohohlwane et al, 2020). Between July 2020 and February 2021, 41-49% of adults reported school feeding amongst attending learners (*Figure 10*). By April 2021, this proportion had risen significantly to 56%.

Figure 10: Access to food at school by NIDS-CRAM wave and learner attendance



Source: GHS (2018); NIDS-CRAM, Waves 2 and 3 (2020) and Waves 4 and 5 (2021)

Notes: The sample is all adult respondents who reported to live with at least one child (<=17 years of age) at the time of interview. The unbalanced panel is used, and data are weighted appropriately. 95 percent confidence intervals are shown.

Although this statistic is approaching pre-COVID-19 levels (measured using the 2018 GHS), this number needs to (as with school attendance) be caveated by the fact that adults were asked about *any* access to food at school in the two weeks prior to the survey. Therefore, there is little clarity on the frequency with which children are receiving food at school. Importantly, it is not possible to determine from the NIDS-CRAM data whether learners are able to access food on days when they are not attending school (due to rotational timetabling), or whether they are receiving food parcels to account for school meals missed. The fact that overall child hunger has remained stable between October 2020 and April 2021 is cause for concern. However, it is evident that perpetual hunger has fallen: comparing July 2020 to April 2021, a significantly greater proportion of child hunger is accounted for by hunger occurring for 1-2 days of the week (results not shown here).

In the Wave 4 NIDS CRAM education report, Shepherd et al (2021) estimated at least 55 feeding days were lost during the period of no in-person schooling. This estimate is as high as 133 days of meals lost once rotational attendance is considered. On 17 July 2020, the High Court ruled against the DBE and PEDs in a court case led by a civil society organisation, Equal Education. The ruling ordered reinstating the programme within 10 days and the submission of progress reports to the court every 15 days.

To date, 14 reports have been filed, the latest being for the period 31 May to 18 June 2021. These figures are self-reported by schools through standard NSNP reporting processes. *Table 7* below shows a summary of NSNP meals delivered between mid-April 2021 and mid-June 2021, across four reporting cycles. The reported figures consistently show that about 1.5 million learners were not receiving meals since April 2021, with cases of food wastage cited through meals being prepared but not collected. The reported figures by Gauteng, Limpopo and Mpumalanga indicate that they were meeting their targets over this period. The North West, KwaZulu Natal and the Free State have reported feeding at least 75% of targeted learners, whilst the Western Cape has shown a consistent proportion of 60% of targeted learners fed. The Northern Cape shows a pattern of school meal access that aligns with the onset of the early third wave in this province. The decline in numbers of learners fed may, therefore, be linked to non-attendance driven by concerns around COVID-19 infection and spread.

Reported efforts to increase feeding include the traditional preparation of cooked meals served at schools daily, cooked meals prepared for collection daily by learners on rotational attendance, and the provision of food parcels distributed to learners and parents. While advocacy groups are demanding that more be done, the DBE has communicated that designated transport for NSNP meal access for learners on rotation or home delivery of meals is not financially feasible, while the provision of meal vouchers is being considered for the future. The Pandemic Electronic Benefits Transfer (P-EBT) program adopted in the United States that provides families with funds equivalent to the cost of weekday meals that their children would have been eligible to receive at school mitigated hunger for 3 million children, representing 10% of children who lost access to school meals when schools were closed.

The GHS 2018 shows that more than 80% of learners aged 7-17 years attending school nationally and receiving a meal walked to school, with less than 3% using government funded transport. However, this figure is 68% in the Western Cape, and at least a quarter of learners in the Western Cape report making use of public or shuttle transport (i.e. school buses, minibus or other taxis, and group-hired vehicles), which is significantly higher than all other provinces apart from Gauteng. So, while there may be several binding constraints to accessing meals nationally, lack of transport may be a particular constraint in specific provinces.

Table 7: NSNP meals provided by province April 2021 to June 2021

Province	Targeted learners 2021/22	12/04/2021	30/04/2021	24/05/2021	15/06/2021
Eastern Cape	1,855,065	1,578,708 (85%)	1,578,708 (85%)	736,855 (40%)	1,578,708 (85%)
Free State	596,674	499,488 (84%)	560,027 (94%)	572,556 (96%)	453,547 (76%)
Gauteng	1,599,116	1,593,508 (100%)	1,593,508 (100%)	1,574,894 (98%)	1,580,212 (99%)
KwaZulu-Natal	2,442,744	1,802,944 (74%)	1,849,629 (76%)	1,914,767 (78%)	2,090,570 (86%)
Limpopo	1,644,363	1,610,368 (98%)	1,600,473 (97%)	1,599,143 (97%)	1,441,708 (88%)
Mpumalanga	920,110	915,533 (100%)	920,110 (100%)	920,110 (100%)	920,110 (100%)
Northern Cape	449,277	358,562 (80%)	242,108 (54%)	220,642 (49%)	152,878 (34%)
North West	751,400	677,913 (90%)	677,913 (90%)	576,321 (77%)	572,987 (76%)
Western Cape	448,437	267,529 (60%)	259,859 (58%)	260,146 (58%)	274,349 (61%)
Total	10,707,186	9,304,553 (87%)	9,282,335 (87%)	8,375,434 (78%)	9 065 069 (85%)

Source: Adapted from the Department of Basic Education- Judgement and court order compliance: National School Nutrition Programme.

Notes: Report as on 21 June 2021. Proportions of targeted learners fed shown in parentheses.

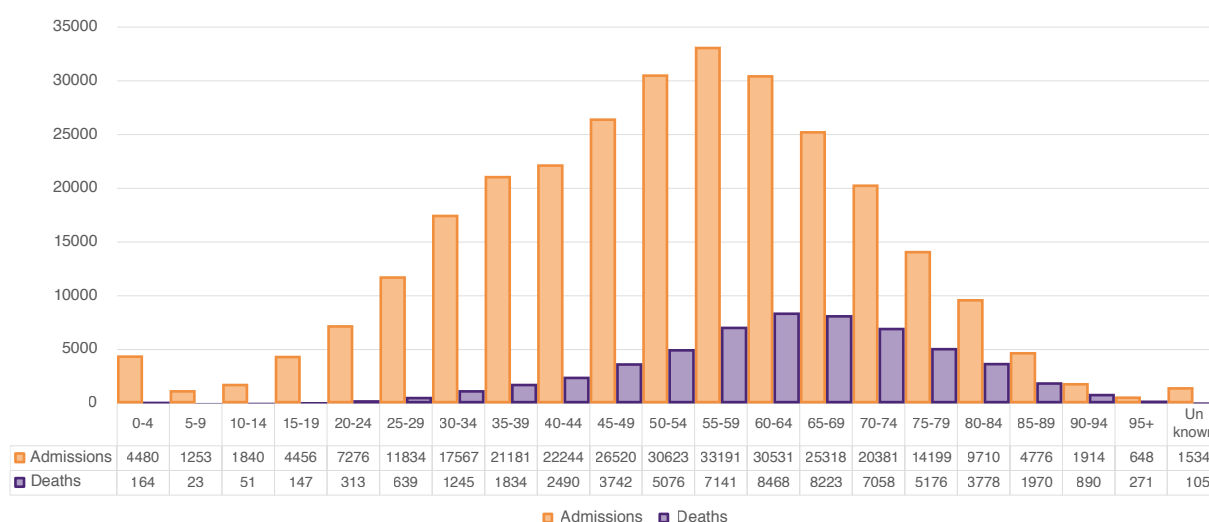
6. Learner and teacher infections and vaccination

While our paper has discussed attendance, the societal implications of school disruptions (such as child and adult hunger), as well as adult worry, the objective health risk posed to both learners and teachers when schools are open remains a key aspect of understanding school disruptions. This section provides an update on the Wave 4 paper using the latest evidence. In a 24 May 2021 report on COVID-19 cases amongst children, the National Institute for Communicable Diseases (NICD) reviewed cases from 1 March 2020 to 1 May 2021.⁶³ The report reaffirmed that, comparing children younger than 20 years of age with adults aged 20 and older, the former are: less likely to contract or spread COVID-19; often not the first case within a household; and even when they contract COVID-19, its presentation is milder. Significantly, they also reaffirmed that positive cases amongst children are unrelated to school terms (i.e. the timing of school opening), but rather follow community patterns.

Comparisons are also made between these two groups on the basis of admission, ventilation and death. As of 1 May 2021, there were 148,768 COVID-19 cases amongst children younger than 20 years, representing 9.5% of all cases and a 5.5 times lower chance of infection than those older than 19 years. Individuals younger than 20 represent 4% of overall admissions (n = 9,918 children hospitalised), indicating hospitalisation that is 13.3 times lower than that of individuals older than 19 years. Unfortunately, 401 cases of child hospitalisation (i.e. 4% of child admissions) resulted in death. Of these, 146 (36%) were amongst those aged 15 to 19 years old, and 125 (31%) amongst those under one years old. Underlying conditions were found amongst 60% of the 401 cases of death, with asthma and chronic pulmonary disease representing the highest proportions, followed by diabetes, HIV and active TB. In conclusion, while overall infections were low amongst children 19 years old and younger, within this group infection has been highest amongst those aged 15 to 19 years.

Figure 11 below shows the admission and deaths from March 2020 to 19 June 2021, while this is an extension of the timeframe discussed earlier, the same patterns remain. As in previous analysis, the age range with the highest admission and fatalities were amongst those older than 50 years. The most admission took place amongst 50- to 64-year-olds peaking amongst 50- to 59-year-olds at 31191. The highest fatalities were amongst those aged 60 to 64 years at 8463.

Figure 11: Number of reported COVID-19 admissions and in-hospital deaths by age, 5 March 2020-19 June 2021



Source: Data obtained from NICD weekly sentinel hospital report for Week 24, 2021

⁶³ National Institute for Communicable Diseases. 24 May 2021. Epidemiology and clinical characteristics of laboratory-confirmed cases of COVID-19 aged ≤19 years, South Africa, 1 March 2020-1 May 2021.

In summary, there were higher hospital admission rates in the second wave compared to the first wave amongst groups younger than 1, 1-to-4 years old and 15-to-19 years old. The reasons for this are not clear, although higher admissions could reflect increases in testing and higher transmission amongst childbearing women, amongst other factors. Finally, child infections seem to follow rather than drive adult infection. In a South African Paediatric Association webinar held on 23 June 2021, representatives from the South African Medical Research Council (SAMRC) confirmed the same. Furthermore, since February 2021 the SAMRC has not issued any new statements that contradict their assertion that schools should remain open as they do not contribute to increased cases of infection in communities.

Finally, a new study of COVID-19 infections at the household level led by Prof Cohen, co-head of the NICD Diseases' Centre for Respiratory Diseases and Meningitis and an associate professor of epidemiology, conducted in Klerksdorp (North West) and Agincourt (Mpumalanga) over the past year has begun to provide additional evidence on asymptomatic carriers, household transmission and the role of children in virus transmission. This study, known as the PHIRST⁶⁴ COVID-19 study, builds on an existing longitudinal cohort study that monitored the burden and transmission of respiratory viruses and flu amongst 50 households from 2016 to 2018. In the COVID-19 extension, participants were tested twice a week for COVID-19 and flu throughout 2020, and information on their symptoms was also collected. Preliminary findings⁶⁵ are that a third of participants had contracted COVID-19 over the first two waves, but of these 65% were asymptomatic. Importantly, children 12 years and younger were less likely to get infected, and both young children and adolescents were confirmed as much less likely to be the index case—i.e. the one introducing the disease into the household—than adults. While there have been clusters of outbreaks at school, this data reaffirms that children are not at high risk of transmitting or contracting the disease whilst at school. A further point of emphasis, though, is the importance of adopting non-pharmaceutical practices—such as mask wearing and sanitising—as opposed to closing schools, for reducing transmission.

Teachers are a second key stakeholder in school, and the impact of COVID-19 on them and their ability to teach is central. In our NIDS-CRAM Wave 4 policy paper (Shepherd et al, 2021), we provided new excess-death analysis of teacher payroll data (PERSAL) that estimates the number of deaths amongst publicly employed educators that are attributable to COVID-19. Analysis of the period 27 March 2020 to 28 February 2021 compared to the same period a year earlier indicated excess deaths of 1,678 teachers, increasing the overall deaths from the expected 1,354 'based on non-pandemic trends, to a total of 3,032 deaths' (Gustafsson, Maponya, and Mahlangu, 2021)⁶⁶. Given lags in data capturing, the most up-to-date figures indicate a total of 3,566 deaths between 27 March 2020 and 28 February 2021, with an excess of 2,212 deaths.

Figure 12 below further indicates updates on previous analysis to include the period 27 March 2020 to 27 May 2021. By the end of the full 14-month period, total teacher deaths stood at 3,881. This is compared to a pre-pandemic total of 1,598; that is, the total number of deaths that would normally occur across this 14-month period (27 March to 27 May). Therefore, excess teacher deaths since the closure of schools at the start of the pandemic has been 2,283. Focusing on the period 15 February to 23 April 2021—the first term of the 2021 academic year—a total 407 teacher deaths have been recorded; this is compared to 236 total deaths over the same period in pre-pandemic times. To put these 171 excess teacher deaths that occurred over the 10-week long first term that represents a time over which all schools were open into perspective, excess deaths over the December/January school holidays that lasted eight weeks were reported to be 1,123. Therefore, the trend post February 2021 provides further evidence that the major factor influencing the risk to teachers is the overall prevalence of the virus in society, rather than school attendance. It needs to be emphasised, however, that these figures are from PERSAL, and therefore exclude a few educators not based in

64 Prospective Household cohort study of Influenza, Respiratory Syncytial virus, and other respiratory pathogens community burden and Transmission dynamics in South Africa (PHIRST). The PHIRST-C study is a collaboration between the CRDM of the NICD and NHLS in partnership with Agincourt and the PHRU at Chris Hani Baragwanath Hospital. The U.S. Centers for Disease Control and Prevention (CDC) fund the study.

65 Shared at the South African Paediatric Association webinar held on 23 June 2021

66 Gustafsson, M. Maponya, T and Mahlangu, M. 2021. Excess deaths of publicly employed educators during the COVID-19 pandemic. Analysis for the Department of Basic Education.

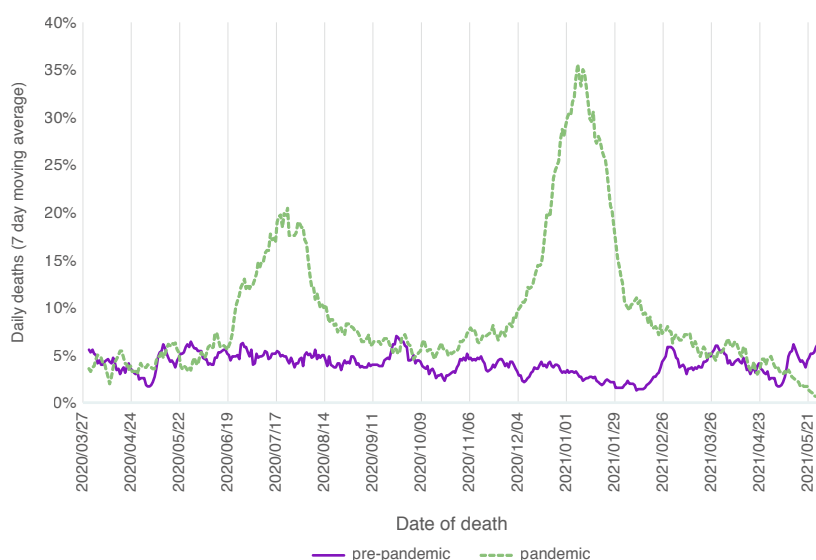
schools, and exclude privately employed educators. We might, then, expect the total number of teachers who have died to exceed the figure of 2,283 by around 10%.

While teachers are not at a higher risk than other workers with similar age and health profiles, there is seemingly continuous anxiety as indicated by ongoing contestation on schools remaining open (discussed earlier in this paper). Over and above the continued implementation and encouragement of non-pharmaceutical measures for the mitigation of infection spread—such as mask wearing, social distancing, and other protocols—the primary pharmaceutical response has been vaccinations. The paper by Burger et al (2021) using Wave 5 data provides details on this. The initial vaccination roll-out targeted those who are aged 60 and above; 5.4% of teachers are part of this demographic and were therefore eligible for vaccination in May 2021.⁶⁷ On 19 June 2021, the South African government announced that it would begin vaccinating all teachers across all schools in the country.

This is a special drive taking place in parallel with the national vaccines campaign. About 580,000 Johnson & Johnson (J&J) vaccines were procured for all educators in public and private schools, as well as those appointed by School Governing Bodies. Non-teaching staff appointed in the public education sector such as security guards, NSNP food handlers and other support staff/volunteers are also part of this phase, although the same does not apply to independent schools. Administration staff and all office-based officials were furthermore included. Exclusions are, as mentioned, independent sector non-teaching staff, as well as ECD centres.⁶⁸

Vaccine administration is scheduled from 23 June until 8 of July 2021, originally scheduled to overlap with school holidays, but still occurring ahead of the partial reopening of schools on 19 July and the full reopening of primary schools on 26 July 2021. By 30 June 2021, 238,000 vaccines (41%) had been administered within 7 days of rollout, with a further 8 days remaining.⁶⁹ The vaccine take-up amongst educators, therefore, appears to be high. This is significant, as a full return to school for learners and teachers in primary schools is expected in Term 3. There are currently no specific reports on adverse side-effects recorded, although this may be available in the future.

Figure 12: Daily teacher deaths in 2019 before the pandemic, and during the pandemic 2020/21



Source: own calculations using preliminary DBE report (Maponya, 2021).

Note: The graph is based on mortality rates (deaths in a year per 1,000) educators

67 Gustafsson, M. 2021. The case for a return to daily attendance at the primary level. 3 May 2021.

68 Department of Basic Education. 2021. Minister Angie Motshekga: Basic Education sector's response to the impact of Coronavirus COVID-19 on schooling. Issued 19 June 2021 and Department of Basic Education. 2021. Circular S3 of 2021: COVID19 Vaccination Roll out in the Basic Education Sector in Phase Two of Government Vaccination Programme.

69 Department of Basic Education. 2021. Media statement Vaccine update. Issued 30 June 2021.

The “one-shot” J&J vaccine: An overview of the research

One of the vaccines that has undergone extensive testing regarding its efficacy is the “Janssen Ad26. COV2.S Vaccine”, commonly referred to as the Johnson & Johnson (J&J) vaccine. It has been approved by the World Health Organization (WHO), the EU, the European Medicine Agency, the United States’s Food & Drug Administration (FDA), as well as the regulatory bodies of Canada, Brazil, Chile, New Zealand, and - importantly - the South African Health Products Regulatory Authority (SAHRPA). The briefing provided to the FDA (FDA, 2021) reports the full results of the Phase Three trial of the vaccine that included approximately 40 000 participants from eight countries, including South Africa. The study took the form of a Randomised Control Trial (RCT), where the participants were split into two groups: the Vaccine Group, and the No-Vaccine Group (control group). Of the 39 321 participants, 19 630 (49.9%) received the vaccine and 19 691 (50.1%) did not (FDA, 2021: p.21).

The two groups were monitored, and the health outcomes and COVID-19 status of all participants reviewed after 14 and 28 days, respectively. The outcomes of the two groups are summarised in Table X below. To summarize the findings, from this trial study the J&J vaccine emerges as 100% effective against death from COVID-19: no one in the Vaccine Group died from COVID-19, compared to seven people in the No-Vaccine Group. The vaccine is also shown to be 85% effective against severe COVID-19, i.e. requiring hospitalisation; after 28 days, five people in the Vaccine Group acquired severe COVID-19, compared to 48 people in the No-Vaccine group.

Table 8: Outcomes of the Johnson & Johnson Phase 3 Trial of 39 321 participants

Outcomes	Vaccine group		No-Vaccine group	
...Onset at least 14 days later	Severe/critical: Deaths	14 0	Severe/critical: Deaths:	60 0
...Onset at least 28 days later	Severe/critical: Deaths	5 0	Severe/critical: Deaths	34 7

Source: FDA (2021: p.32)

7. Conclusion and recommendations

The Secretary General of UNESCO has called the adverse effects of the pandemic on learning a generational catastrophe. The impact of school closures as measured by NIDS-CRAM has been severely negative for South African children, as demonstrated by all the education reports across all five waves. This report that incorporates the final fifth wave of NIDS-CRAM data provides the latest evidence in the series, and responds to the key questions of: (1) How has school attendance changed over the last year, and what proportion of school children remain out of school in 2021?; (2) How much learning has been lost and how can this be better understood?; (3) Have parents and guardians shown persistence in their level of worry about learners returning to school during the COVID-19 pandemic, particularly as conditions and national lockdown levels have changed? (4) How has hunger in the household, especially amongst children, been affected by school attendance and disruptions to school feeding? (5) What are the trends in infection, hospitalisation and mortality amongst children and teachers?

7.1. School reopening, attendance, and learning

At the start of the pandemic in early 2020, international bodies such as the WHO recommended school closures as one of the initial non-pharmaceutical strategies to reduce COVID-19 infections and transmission. By April 2020, more than 193 countries, including South Africa, had followed this advice and closed schools.⁷⁰ As the science on COVID-19 infections, virus spread and the

70 UNESCO.2020. Global monitoring of school closures caused by COVID-19. <https://en.unesco.org/covid19/education-response> accessed 5 September 2020

associated risks have increased, there has been a resounding call internationally to reopen schools as soon as possible. South Africa responded by partially reopening schools from July 2020, but is yet to implement non-rotational attendance or pre-pandemic state without disruptions.

Prior to the COVID-19 school closures, South Africa, like most developing countries, had achieved near universal school enrolment. In November 2020, when asked about the attendance of young people living in their household, approximately 95% of adults reported that all learners in their household had recently attended school. This number has declined to 90% in April 2021. Considering pre-pandemic data from the GHS, it is estimated that the proportion of out-of-school children aged 7-17 years has increased from approximately 2% to 6-7%. That is, as many as 750,000 children may now not be attending school. We can therefore conclude that disruptions in schooling have contributed to significant reductions in school enrolment.

It is worth bearing in mind that dropping out of school is often not a singular event but follows a process of disengagement influenced by various factors, including adult concern, confusion about attendance rotations, and greater anxiety of learners who were unable to complete work that should have been “learnt at home”. **We therefore affirm and support the directive to return to school on a daily, full-time basis with traditional timetabling implemented as soon as possible.**

There is strong emerging evidence that disruptions in school attendance have not only contributed to possible learner drop-out, but also to learning losses that have the potential to expand and compound while learner attendance remains disrupted. For most education systems, especially those in low and middle income countries, disruptions in school attendance equate to diminished access to learning. The case of learning poverty—defined as the proportion of 10-year-olds that are unable to read and understand simple text—has increased by an additional 72 million children globally over the past year. Applying the World Bank’s method of learning poverty to the Trends in Mathematics and Science Study (TIMSS) 2015 assessment data for South African grade 9 learners, Reddy et al (2020) find that learning deprivation gaps (i.e learning inequality) are expected to increase across socioeconomic and racial lines. Using the 2019 TIMSS data and comparative benchmarks of learning lost from Belgium, Reddy (2021) further estimates 48-63% of a year of learning lost amongst grade 9 learners in 2020. Our previous estimates based on the work of Gustafsson and the South African literacy studies—namely, EGRS II and Funda Wande—indicate a learning loss ratio of 1:2. Based on this, and given the continuation of attendance rotations in 2021, we estimate that by June 2021, most children in South African schools, and particularly those enrolled in grades 1 to 9, may have lost 70% to a full year of learning since March 2020.

Considering the evidence on the magnitude and depth of learning losses in South Africa, mitigation should become the primary focus moving forward. However, mitigation is a formidable challenge to be met in the midst of extended closures and no scalable alternative through remote learning for the masses. **We therefore again recommend that schooling should resume on a daily basis for all learners, with no further disruptions. Furthermore, careful planning and consideration of the subject and content taught should be examined and strengthened. Finally, we recommend that ongoing measurement and monitoring of changes in learning losses, catch-up or gains should be established and prioritised for the next five years.**

7.2. Household wellbeing and social protections

The disruptions and uncertainty brought about by the COVID-19 pandemic have exacerbated existing socio-economic inequalities and societal pressures. While parent worry had decreased significantly from 56% in Wave 4 (February/March 2021) to 45% in Wave 5 (April/May 2021), representing the lowest level across all NIDS- CRAM waves, continuous worry has been disproportionately represented amongst disadvantaged groups—black African, those who are less educated, and those living in food insecure households. An estimated 3 million adults living with children reported both adult and child hunger in their households in April 2021. Moreover, at least half of adults reporting food insecurity and that learners in their households did not receive a school meal in the past two weeks show signs of depressed mood.

Existing evidence of the impact of food insecurity on parents from large-scale studies has indicated increased experiences of depressive mood, anxiety and stress, particularly amongst female carers (Bronte-Tinkew et al., 2007; Whitaker et al., 2008; Melchior et al., 2009)⁷¹, with implications for parenting (e.g. the adoption of 'harsh' parenting practices and avoidance behaviour) and child developmental outcomes. This does not take into account the likely toll that major disruptions caused by full and partial school closures over the past 15 months have taken on the mental health of learners and their teachers. Therefore, as argued by Stretesky et al (2020, "potential gains in mental health are able to be achieved by simply improving children's access to sufficient, safe, and nutritious food" (p.14).

The NIDS-CRAM Wave 5 data shows that by April 2021, 56% of adults living with children reported children receiving a meal at school. This represents a significant increase from November 2020 and February 2021 levels of between 40% and 49%. The April 2021 estimate is converging on GHS pre-pandemic figures, yet it should be noted that the question in Wave 5 referred to receiving a meal over a 2-week period, and not weekly as in previous waves.

However, the fact that reports of child hunger (almost double that of pre-pandemic levels) has remained stable between October 2020 and April 2021 is concerning. While the NSNP programme is not the only source of meals for children, it is an important primary source. According to DBE reports, just over 9 million learners have been accessing the NSNP programme between April and June 2021. This makes up approximately 85% of targeted learners—a significant feat. While the programme has adapted its delivery, and the majority can access meals on days/weeks when they are not attending, the 1.5 million learners without access remain a concern. **While we again recommend a full, daily attendance return to school—which has historically been a successful delivery model—we also recommend that the use of food vouchers, already under investigation by the NSNP, be considered further.**

7.3. Virus infections and risk at school

The COVID-19 pandemic has unfortunately resulted in unique pandemic related hospitalisation and fatalities across the country, including in the basic education sector. The NICD has reported changes in infections, hospital admissions and fatalities since March 2020, with the effects of the first two peaks recorded in previous NIDS-CRAM policy papers. While the third peak is ongoing, and reports are not yet available on the overall impact, this report includes data and analysis until June 2021. As detailed in this report, children who are 19-years and younger have maintained a lower infection rate, now estimated at 5.5 times lower than those older than 19 years. Furthermore, children aged 19-years and younger have a 13.3 lower chance of hospitalisation than older individuals, and schools have not emerged as primary transmission sites or contributors to peaks in infections.

While teachers are not more vulnerable to COVID-19 than their counterparts, the education sector's vaccine drive communicates the value of education in South Africa. Based on this prioritisation of educators and the adverse long-term effects of school disruptions on children **it is recommended that a new compact be formed in the sector and moving forward school closures should not be an option in the response to COVID-19.**

⁷¹ Bronte-Tinkew, J., Zaslow, M., Capps, R., Horowitz, A., & McNamara, M. 2007. Food insecurity works through depression, parenting, and infant feeding to influence overweight and health in toddlers. *The Journal of nutrition*, 137(9), 2160-2165.
Melchior, M., Caspi, A., Howard, L.M., Ambler, A.P., Bolton, H., Moffitt, T.E. 2009. Mental health context of food insecurity: A representative cohort of families with young children. *Pediatrics*, 124, e564–e572.
Whitaker, R.C., Phillips, S.M., & Orzol, S.M. 2008. Food insecurity and the risks of depression and anxiety in mothers and behavior problems in their preschool-aged children. *Pediatrics*, 118, e859–e868.

