

KEY POINTS

- Comparison of the 2019 and 2021 secondary school exam data shows that test scores in *Dzongkha* (national language), English, and Science only dropped slightly in absolute terms.
- The performance gaps between groups that existed before the pandemic did not significantly widen during the limited school closures that occurred in higher grades.
- Aside from past performance, several factors predicted post-closure exam performance, including having an educated parent and computer access at home.
- Learning environment variables such as access to computers and boarding facilities appear to have been important for preventing learning losses.
- The government prioritized school reopening for secondary school students scheduled to take high-stakes examinations, which could have accounted for the relatively small learning loss. COVID-19 impacts on primary and lower secondary school students remain critical areas for future analysis.

Assessment of Changes in Secondary School Learning Outcomes in Post-COVID-19 Bhutan

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INTRODUCTION

Education system performance in Bhutan has been relatively strong compared with other countries at a similar level of economic development. For instance, the country's average score on the Programme for International Student Assessment for Development conducted by the Organisation for Economic Co-operation and Development in 2019 is comparable to that of top-performing participating countries in all domains (Bhutan Council for School Examinations and Assessment 2019). Like most other countries, however, Bhutan had to close its schools to contain the spread of the coronavirus disease (COVID-19). A key question is whether school closure affected the level of educational progress that had been achieved pre-pandemic.

Notes: This brief was peer reviewed by Rhea Molato, associate economics officer, Economic Research and Development Impact Department, Asian Development Bank (ADB); and Jukka Tulivuori, social sector specialist, Human and Social Development Sector Office (HSD), Sectors Group, ADB. The authors are also grateful for the review and valuable inputs from Unika Shrestha, social sector economist, HSD, Sectors Group, ADB. The authors appreciate the data, feedback, and support provided by the Ministry of Education and Skills Development, Royal Government of Bhutan and the Bhutan Council for School Examinations and Assessment.

All schools were closed on 18 March 2020. In July 2020, schools serving Class X and XII were reopened. They were prioritized for reopening because of the high-stakes examinations taken at the end of those grades: Results in Class X on the Bhutan Certificate of Secondary Education (BCSE) exam determine continuation to upper secondary school (Class XI and XII), while Class XII results on the Bhutan Higher Secondary Education Certificate (BHSEC) exam determine continuation to higher education (Figure 1). While lockdowns were reimposed in August and December 2020, secondary schools serving Class X and XII were kept open in light of the impending board exams. Thus, school closures for upper secondary students were less than half the length of those for primary and lower secondary school students.

The Government of Bhutan took comprehensive measures through the Ministry of Education to mitigate the impact of school closures on students. In addition to social safety nets targeted to vulnerable households, education-specific policies included support for home-based instruction methods (e.g., radio, television, social media, printed materials, Google Classrooms) and curriculum prioritization, with subjects stripped down to 65% of material deemed core by a curriculum committee. While video lessons broadcast on the Bhutan Broadcasting Services were the core remote instruction mode, 71% of schools supplemented the lessons with social media apps (Ministry of Education, Helvetas Bhutan, and UNICEF 2021). Additional measures were taken for disadvantaged and vulnerable students. Approximately 30,000 secondary school students had poor internet connection and no television access; therefore, printed self-instructional materials were developed and disseminated. Repurposing school

facilities to increase boarding capacity and moving students from non-boarding to boarding schools were also parts of Bhutan’s COVID-19 education response. Class X and XII students in high-risk areas for COVID-19 infection were moved to one of Bhutan’s 177 boarding schools so that their education could continue uninterrupted.

As the pandemic has ended, schools worldwide have returned to business-as-usual. But as in-person instruction and assessment resumed, emerging evidence shows school closures caused serious learning setbacks in some contexts, especially for students from low-income households with less educated parents (ADB 2022). Based on cross-country calculations by Hanushek and Woessman (2020), students are expected to have suffered a 2.6% loss in lifetime income due to one-third of a year of COVID-19-induced school closure. Yet there is limited evidence on the extent to which this holds true for Bhutan’s pandemic experience. Given the compensatory actions taken during school closures, learning losses may have been relatively mild in Bhutan. With the prioritization of students preparing for the BCSE and BHSEC exams, learning losses were likely least severe for secondary school students.

On the other hand, secondary school students were at a critical point of their education, and had less time than their younger counterparts to catch up on lost learning. The 5-month interruption to in-person instruction may have posed significant challenges for secondary school students. Television broadcasts did not fully substitute for in-person instruction in

Figure 1: Education System of Bhutan

Level	Early Child Care and Development	Pre-Primary	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	1st Year	2nd Year	3rd Year	4th Year
ISCED	0	1						2					3	5				
Type	ECCD centers	Primary school						Lower secondary school					Middle secondary school	Higher secondary school	Undergraduate courses			
													Continuing education					
													Nonformal centers					
													Vocational education system (TTI/IZC) (ISCED 3-4)					
													Labor market					

ECCD = early childhood care and development, ISCED = International Standard Classification of Education, IZC = institute of zorig chusum, TTI = technical training institute.

Source: Ministry of Education, Bhutan, 2021.

terms of hours, and only 60% of the population has internet access (UNICEF and UNESCO 2021). Access to school meals was also interrupted by school closures, though a take-home ration program was established for the most vulnerable students. Many parents are illiterate since public education is a relatively new development in Bhutan, so home support was limited especially in rural areas. When parents were asked about the government's emergency response to education, 29% of surveyed parents believed that it was ineffective and that online teaching materials for the *Dzongkha* (national language) subject were underdeveloped (Ministry of Education, Helvetas Bhutan, and UNICEF 2021).

This brief analyzes the performance of students who were in Class XI during the March–July 2020 secondary school closure. Comparisons on several critical social dimensions are made to identify which students suffered the most from the closures by location (rural or urban), gender (women or men), parental education, school boarding facilities, and household computer and TV ownership. Analyzing which types of students were most and least affected by the disruptions may hold lessons for education policymakers who can prioritize recovery efforts and response plans for future crises.

DATA

To investigate learning losses during the COVID-19 school closures, three datasets were brought together:

- **Detailed national examination test score data for all subjects taken by all Class X and XII students in 2016–2021.** In each year, performance on each subject is broken down into a theory component (written exam) and a continuous assessment component (coursework). There is also a practical component for some subjects. BCSE and BHSEC are the only exams in Bhutan that are standardized nationwide. These data were provided by the Bhutan Council for School Examinations and Assessment.
- **School-level data on enrollment and facilities from all schools for 2022.** These data were provided by the Education Management Information System for 2022 managed by the Ministry of Education and Skills Development.
- **Demographic data for a sample of 21,882 students who were in Class XI and XII in 2021.** Collected variables include student gender, age, location (urban or rural), school type (boarding or non-boarding, public or private), computer access, parental education, and household size. These data were collected via online survey by ADB in 2021.

The BCSE and BHSEC data were used to assess the trend over time. Furthermore, to examine variations of learning loss by different student groups, the three data sources were merged based on student names, sex, and birthdate with a 70% match rate. There was no statistically significant difference in performance between matched and unmatched students.

Since 2020 was a year of upheaval, comparisons are drawn between performance in the 2019 academic year (exams administered in December 2019) and the 2021 academic year (exams administered in February–March 2022) to compare performance before and after the COVID-19 pandemic for the same individual students (panel dataset).

It should be noted that this approach is subject to two important limitations. First, students who were assessed in the two periods are students who progressed to Class XII, as students who did not progress have no Class XII test score. This may mean that students who fell behind are omitted to some degree. Second, the comparison is between test scores administered at two different levels and in two different periods, so any inconsistency in testing may confound comparisons. However, using this comparison in combination with the comparison of test scores for the same grades over time helps alleviate many of these limitations.

There were changes in how pass certificates were awarded starting in 2021 for both BCSE and BHSEC, making it inappropriate to compare pass rates across years. Instead, the analysis compares exam scores directly. In addition, due to the nonstandard nature of continuous assessment (coursework) across schools, theory scores (which are graded in a centralized manner) are the focus for cross-year comparisons and analysis. Furthermore, the analysis focuses on three subjects that are compulsory in Class X and have a high rate of continuation in Class XI and XII: *Dzongkha* (compulsory), English (compulsory), and science (biology, chemistry, and physics—compulsory only for science stream students).

In addition to a simple analysis of summary statistics, regression analysis has been performed and is summarized in the Appendix. The regressions assess student, household, and school characteristics associated with test score value addition (progression) over time for the same students in 2019 and 2021.

FINDINGS

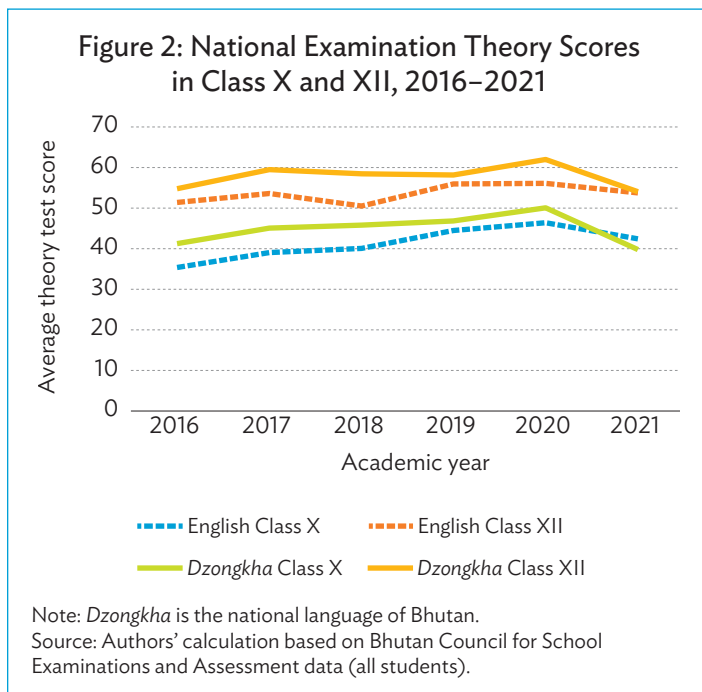
The mix of emergency measures taken by the government was considered appropriate based on the analysis of surveyed students' circumstances.

After merging the three datasets, a sample of 6,663 students with complete information needed for the analyses was obtained (60% of Class X students in 2019). Only 43% of students were men, confirming the reverse gender gap in secondary school participation in Bhutan. Only 16% of students had at least one parent with a higher secondary education, suggesting that many students may have had difficulty getting academic support at home.

Only 42% of students had a computer at home, but the coverage of television (89%) and mobile phones (98%) was much higher. This shows how necessary it was to offer a range of remote learning solutions, especially for the 40% of students who studied at schools without boarding facilities.

Exam scores dropped slightly from 2020 to 2021, reversing a slightly upward trend in previous years.

The extent to which exam scores can be directly compared across years is unclear. Even before the COVID-19 pandemic, average scores fluctuated from year to year, suggesting that scores may not be appropriately used as absolute measures of learning. However, it is notable that there was a positive trend for scores from 2016 to 2020, and the slight decrease in 2021 from 2019 (by about 2.4 points for English and about 7.9 points for *Dzongkha* in Class XII, [Figure 2]) may be reflective of learning loss. This is especially true for *Dzongkha*, a finding that appears consistent with reports that the scarcity of *Dzongkha* language instruction materials constrained progress in the subject during the school closures.



Performance gaps that existed before the pandemic did not substantially widen after school closures.

Before the pandemic, several performance gaps existed among groups of secondary school students. The panel dataset shows that Class XII women outperformed men (by about 1.4 points in English and 2.4 points in *Dzongkha* in 2019), and Class XII urban students outperformed rural students (by 0.7 points in English and 2.0 points in *Dzongkha* in 2019).

The gaps were even wider with respect to socioeconomic indicators. As shown in Table 1, Class XII students in households with computer access outperformed those who did not by 4.4 points in 2019 in English, while Class XII students with at least one parent educated to the upper secondary level outperformed those who did not by 5.1 points.

Table 1: Average Class XII Theory Scores in English and *Dzongkha*, 2019 and 2021

	English		<i>Dzongkha</i>	
	2019	2021	2019	2021
Gender				
Female	46.6	49.9	49.2	50.6
Male	45.3	47.9	46.9	47.9
Geographic location				
Rural	44.9	47.4	47.8	49.2
Urban	46.9	50.3	48.5	49.6
Parental education				
Parent/s did not complete secondary education	45.3	48.3	49.1	50.3
At least one parent with secondary education	50.4	54.5	47.1	48.9
Computer access				
Without computer at home	44.3	47.0	49.3	50.6
With computer at home	48.7	52.4	48.1	49.4

Note: *Dzongkha* is the national language of Bhutan.

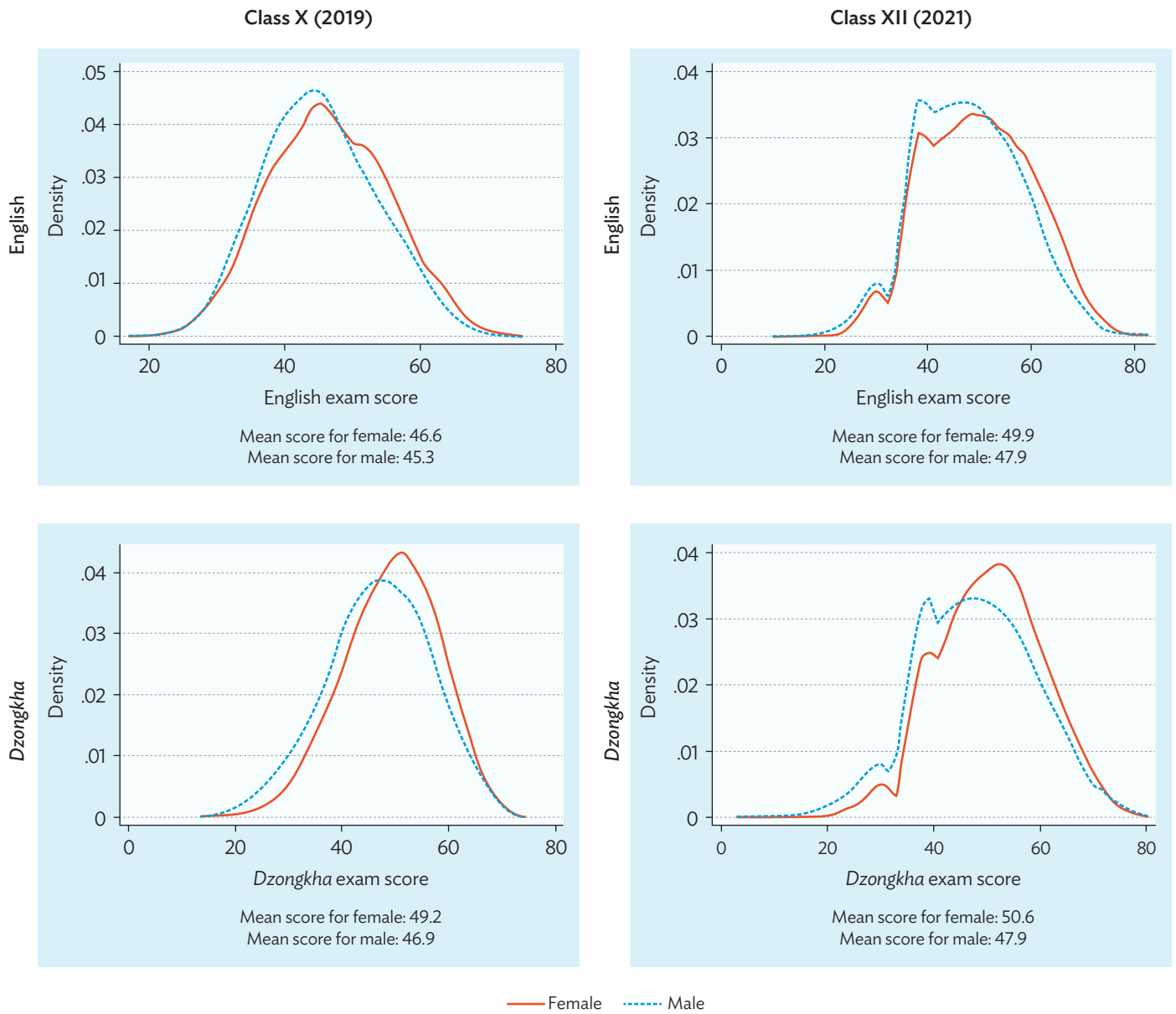
Source: Authors' calculation based on Bhutan Council for School Examinations and Assessment data (panel data).

One might expect these gaps to widen during school closures, with disadvantaged students falling further behind. In fact, that did not occur. While the gaps increased slightly in English in 2021 by parental education (1.1 points), geographic location (0.9 points), and computer access (0.9 points), they did not widen for *Dzongkha* as much (0.6 points by parental education, -0.3 points by geographic location, and 0.1 points by computer access) as per Table 1. Gaps based on gender did not grow substantially for either subject (0.6 points for English, 0.3 points for *Dzongkha*), and none of the changes in gaps was statistically significant. The distributions of English and *Dzongkha* Class X and Class XII exam scores in 2019 and 2021 are described by gender gap (Figure 3), geographical location (Figure 4), and computer access (Figure 5) for reference.

Having a computer and TV at home were associated with English performance but not *Dzongkha* performance.

Counterintuitive patterns in *Dzongkha* performance gaps reveal the complexities of studying the national language. The analysis shows that students without a computer at home outperformed students with a computer at home in *Dzongkha* in 2019 (Figure 5). While having a computer at home was correlated with stronger performance in English in 2021, the same relation did not hold for *Dzongkha*. This seems to reflect the dominance of English-language content online. Having a television at home was conducive to English performance but had the opposite effect on *Dzongkha* performance. This may be a reflection of the predominance of non-*Dzongkha* television programming.

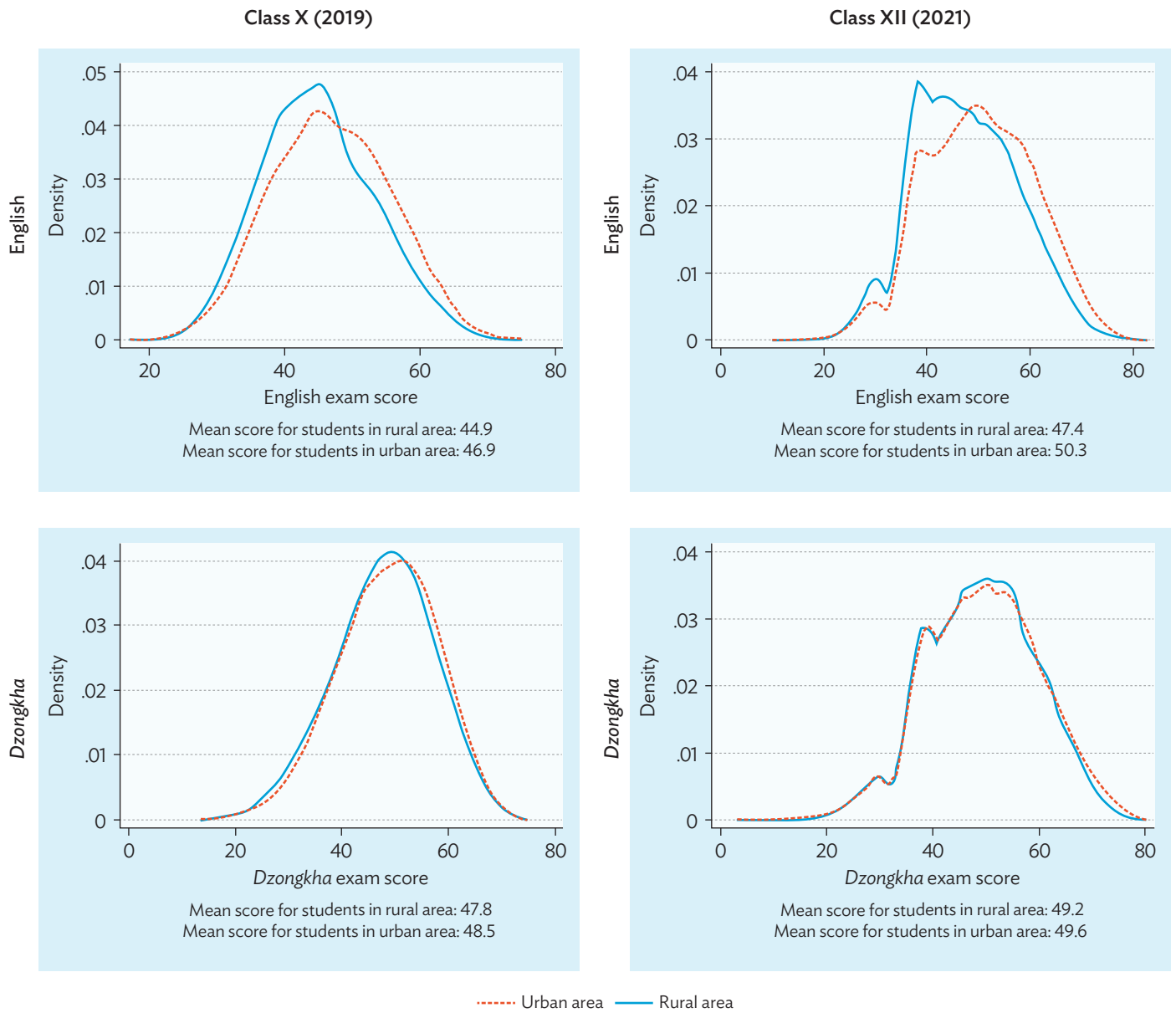
Figure 3: Gender Gaps in English and Dzongkha Scores, Comparison of Same Students in 2019 (Class X) and 2021 (Class XII)



Note: Dzongkha is a national language of Bhutan.

Source: Authors' calculation based on Bhutan Council for School Examinations and Assessment data (panel data).

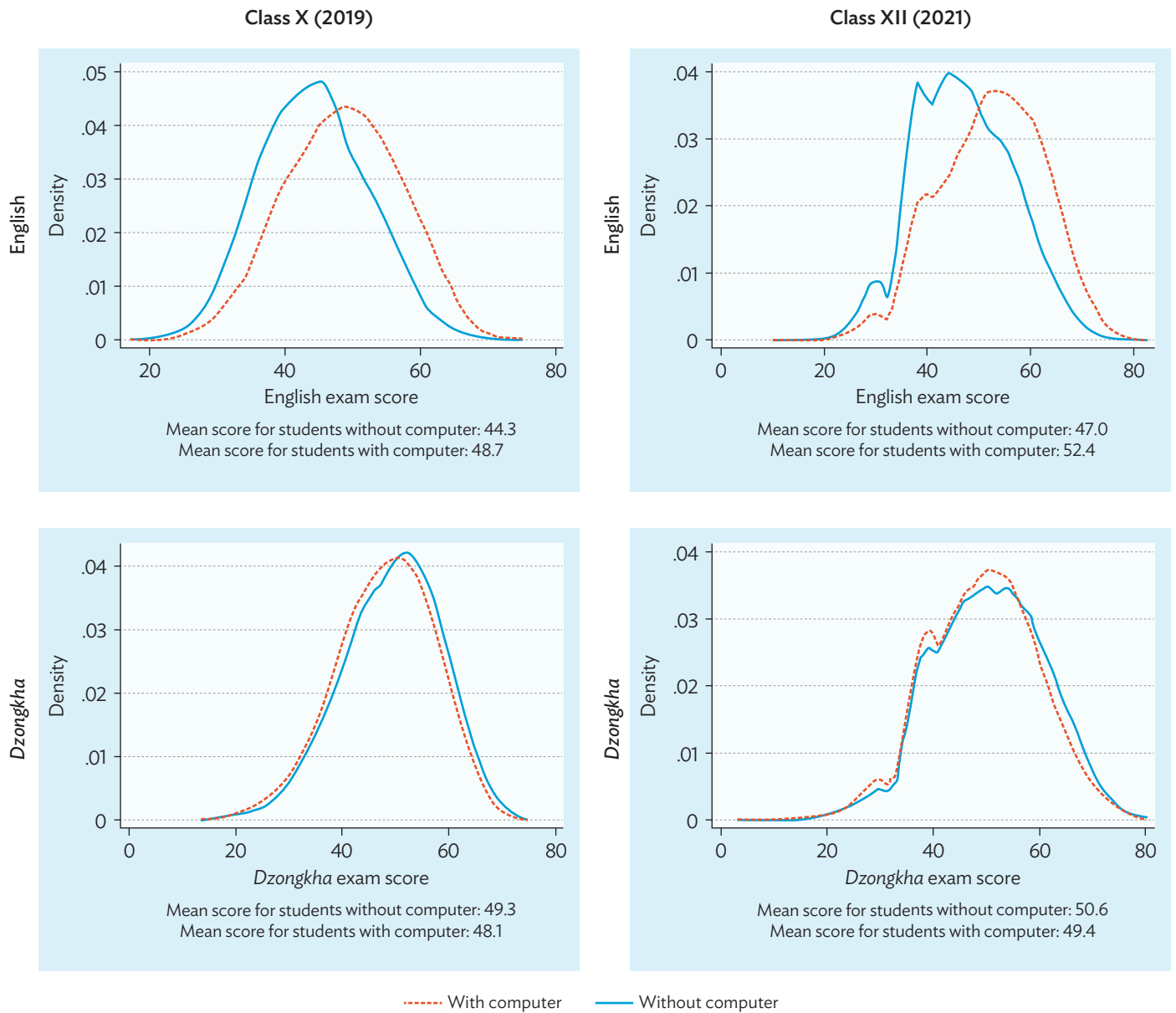
Figure 4: Geographic Gaps in English and Dzongkha Scores, Comparison of Same Students in 2019 (Class X) and 2021 (Class XII)



Note: Dzongkha is a national language of Bhutan.

Source: Authors' calculation based on Bhutan Council for School Examinations and Assessment data (panel data).

Figure 5: Gaps in English and Dzongkha Scores by Computer Access, Comparison of Same Students in 2019 (Class X) and 2021 (Class XII)



Note: *Dzongkha* is a national language of Bhutan.

Source: Authors' calculation based on Bhutan Council for School Examinations and Assessment data (panel data).

The learning environment was associated with exam performance, especially for students that did not attend a boarding school.

Identifying the predictors of Class XII performance in 2021 gives insight into which types of students were most disadvantaged by school closure. The strongest single predictor of Class XII performance was, unsurprisingly, Class X performance. Yet several other important predictors of post-closure performance emerged from the analysis (Appendix Tables A1–A3).

The students who were most protected against falling behind were those who have access to computers at home (especially in science, a subject for which computer access appears to have been very important), and those who would have been disadvantaged had they have been at home (i.e., no access to a computer or uneducated parents) but boarded at school. The analysis in Appendix Tables A1–A3 suggests that boarding schools played an important role in offsetting the effects of household circumstances and equalizing student outcomes for science and *Dzongkha* because they provided an equalized learning environment. This suggests that boarding school attendance kept those students from less equipped households from falling behind when schools were closed.

The students who tended to underperform in 2021 relative to 2019 tended to be men in English and *Dzongkha*, women in science, and students who did not attend boarding school and had multiple siblings at home. This latter correlation could have been due to distractions at home, including the need to do more chores and take care of younger siblings.

Factors affecting performance also depended on how the student performed before the school closures in Class X. Having a parent who completed higher secondary education was particularly helpful for Class XII students who were average performers in Class X.

CONCLUSIONS AND RECOMMENDATIONS

The Class XII raw scores did not decline drastically from 2019 to 2021 based on our analysis. We compare the Class XII performance of students who were in Class XI during the school closures in 2020 with their exam scores in Class X in 2019, which were unaffected by COVID-19-related closures. The decline was more pronounced for *Dzongkha* than English, suggesting that online and printed resources were not as developed as for English.

Turning to relative scores, gaps between groups that existed before the pandemic (e.g., by parental education and household computer ownership) did not substantially widen. In English performance, the advantage of women and urban students increased only slightly after the school closure. One of the most robust results is the protective effect of boarding on exam performance. This underscores the importance of a stable and equalized learning environment.

This brief provides a first look at Bhutan's secondary school performance before and after the COVID-19 outbreak. Its limitations open the door for follow-on analysis, which will have implications for Bhutan's growing workforce for decades to come. Further investigation of secondary school learning loss would begin with an analysis of emergency actions taken by schools. The comprehensive actions taken by schools are documented, and it is known that school management had discretion over what combinations of actions to take, based on the needs of their communities. But there is no central data source that identifies which schools took what actions. Survey data collected while memories of the pandemic are fresh and analyzed in conjunction with the unique dataset constructed for this brief would increase the scope for policy recommendations based on the exam data.

Looking beyond the subset of students analyzed in this brief, there are three areas for further investigation. First is an assessment of dropouts. Pokhrel and Chhetri (2021) report that employment, marriage, and legal issues during closure have resulted in higher dropouts and less continuation to upper secondary school in Bhutan. Second is an analysis of how students living with disability were affected by school closures. Third is an analysis of learning losses in primary and lower secondary schools. During the COVID-19 pandemic, 87% of students mentioned availability of online classes, and 77% considered online classes effective (Bhutan Council for School Examinations and Assessment and Ministry of Education and Skills Development 2023). According to the Class III national education assessment conducted in 2021, many students achieved minimum proficiency (84% for *Dzongkha* reading literacy, 90% English reading literacy, and 93% mathematical literacy). This is encouraging, but in the absence of the comparison data, it is difficult to assess COVID-19 impact on early grade students.

This brief focuses on middle and higher secondary schools because that is the level for which comparable exam scores are available. But the closures were likely most damaging for younger students that were less prepared for remote instruction and had experienced a longer period of school closures in Bhutan.

APPENDIX

 Table A1: Linear Regression Results for *Dzongkha* Exam Scores

	(1)	(2)	(3)	(4)	(5)
Class X <i>Dzongkha</i> score	0.909***	0.910***	0.908***	0.903***	0.902***
Student is male	-0.576***	-0.549***	-0.561***	-0.596***	-0.604***
Student has access to computer at home	0.053	-0.032	-0.003	0.108	0.393
Student has access to mobile phone at home	1.246**	1.272**	1.305**	1.299**	0.525
Student has access to television at home	-0.598**	-0.563**	-0.587**	-0.489**	-0.573
At least one parent completed at least higher secondary education		0.443**	0.497**	0.647***	0.885***
At least one parent completed at least middle or lower secondary education		-0.606***	-0.559**	-0.500**	-0.257
Number of siblings			0.064*	0.037	-0.062
School has boarding facilities				1.454***	0.175
Private school				1.416***	1.438***
School has boarding facilities x <i>At least one parent completed at least higher secondary education</i>					-0.606
School has boarding facilities x <i>At least one parent completed at least middle or lower secondary education</i>					-0.489
School has boarding facilities x <i>Student has access to computer at home</i>					-0.489
School has boarding facilities x <i>Student has access to television at home</i>					0.156
School has boarding facilities x <i>Student has access to phone at home</i>					1.024
School has boarding facilities x <i>Number of siblings</i>					0.153**
Constant	5.258***	5.193***	5.036***	4.129***	5.091***
Observations	6,805	6,686	6,659	6,659	6,659
R-squared	0.672	0.674	0.673	0.678	0.678

*** statistically significant at 1% level, ** statistically significant at 5% level, and * statistically significant at 10% level.

Source: Authors' calculation based on Bhutan Council for School Examinations and Assessment data (panel data).

Table A2: Linear Regression Results for English Exam Scores

	(1)	(2)	(3)	(4)	(5)
Class X English score	0.944***	0.936***	0.933***	0.936***	0.933***
Student is male	-0.789***	-0.832***	-0.842***	-0.849***	-0.867***
Student has access to computer at home	1.087***	0.818***	0.831***	0.887***	1.082***
Student has access to mobile phone at home	0.802	0.863	0.869*	0.854	-0.178
Student has access to television at home	0.255	0.206	0.187	0.245	0.866*
At least one parent completed at least higher secondary education		1.082***	1.011***	1.091***	1.451***
At least one parent completed at least middle or lower secondary education		0.399*	0.332	0.368*	0.352
Number of siblings			-0.061*	-0.075**	-0.178***
School has boarding facilities				0.841***	-0.030
Private school				0.804***	0.842***
School has boarding facilities x <i>At least one parent completed at least higher secondary education</i>					-0.893**
School has boarding facilities x <i>At least one parent completed at least middle or lower secondary education</i>					-0.326
School has boarding facilities x <i>Student has access to computer at home</i>					-0.326
School has boarding facilities x <i>Student has access to television at home</i>					-0.785
School has boarding facilities x <i>Student has access to phone at home</i>					1.369
School has boarding facilities x <i>Number of siblings</i>					0.158**
Constant	4.630***	4.926***	5.317***	4.483***	5.196***
Observations	6,809	6,690	6,663	6,663	6,663
R-squared	0.681	0.680	0.680	0.681	0.682

*** statistically significant at 1% level, ** statistically significant at 5% level, and * statistically significant at 10% level.

Source: Authors' calculation based on Bhutan Council for School Examinations and Assessment data (panel data).

Table A3: Linear Regression Results for Science Exam Scores

	(1)	(2)	(3)	(4)	(5)
Class X Science score	0.697***	0.690***	0.691***	0.706***	0.703***
Student is male	0.666**	0.742***	0.749***	0.724***	0.735***
Student has access to computer at home	1.571***	1.188***	1.196***	1.006***	1.860***
Student has access to mobile phone at home	-0.133	-0.104	-0.105	0.002	-3.461*
Student has access to television at home	0.141	0.005	-0.006	-0.077	1.931*
At least one parent completed at least higher secondary education		1.371***	1.378***	1.243***	1.351***
At least one parent completed at least middle or lower secondary education		0.506	0.497	0.351	0.747
Number of siblings			-0.014	-0.004	-0.323**
School has boarding facilities				0.325	-2.662
Private school				3.090***	3.041***
School has boarding facilities x <i>At least one parent completed at least higher secondary education</i>					-0.587
School has boarding facilities x <i>At least one parent completed at least middle or lower secondary education</i>					-1.322**
School has boarding facilities x <i>Student has access to computer at home</i>					-1.322**
School has boarding facilities x <i>Student has access to television at home</i>					-2.490**
School has boarding facilities x <i>Student has access to phone at home</i>					5.176*
School has boarding facilities x <i>Number of siblings</i>					0.427***
Constant	2.189	2.459	2.444	1.068	2.833
Observations	3,454	3,405	3,400	3,400	3,400
R-squared	0.347	0.348	0.349	0.361	0.366

*** statistically significant at 1% level, ** statistically significant at 5% level, and * statistically significant at 10% level.

Source: Authors' calculation based on Bhutan Council for School Examinations and Assessment data (panel data).

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