TECHNICAL BRIEF

Fall 2019 to fall 2020 MAP Growth attrition analysis

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Summary

The impacts of the COVID-19 pandemic have been unequal in many ways, disproportionately harming communities of color and resulting in inequities in access to education. Historically-underserved student populations are especially vulnerable due to various barriers to learning, including lack of access to a device or reliable internet and unmet need for small-group support. With the cancellation of spring 2020 assessments, school districts are relying heavily on diagnostic and/or interim tests administered in fall 2020 to understand students' academic skills. However, if the students who were not assessed in fall 2020 are systematically different from students who were assessed, the resulting estimated learning losses and achievement gaps related to COVID-19 will be inappropriate for making inferences about learning loss in the broader population of students. This is a critical issue because it can lead to erroneous conclusions and decisions.

The results of this study showed systematic demographic differences across subjects and grades: a larger fraction of attriters were minoritized students, students with lower achievement in fall 2019, and students in schools with higher concentrations of racial/ethnic minorities and socioeconomically-disadvantaged students. These findings suggest that considerable caution is warranted when interpreting fall 2020 assessment results, especially in relationship to previous, typical academic years that may include a substantively different group of students. The systematic differences between attriters and students who were tested in fall 2020 mean that the impacts of COVID-19 on student achievement are likely underestimated. Educational leaders should carefully consider demographic shifts in the students who tested as they make decisions on how to best support their students' growth and recovery.

Unequal Impacts of COVID-19

The impacts of the COVID-19 pandemic have been unequal in many ways, disproportionately harming communities of color. The virus has taken a larger toll on minoritized populations; death rates for Black Americans more than double that of white Americans.[i] In the middle of the pandemic and related economic downturn, police killings of Black Americans sparked civil unrest that persisted for several months, with potentially severe negative implications on the academic and personal wellbeing of children, especially children of color.[ii,iii]

The public health crisis also resulted in inequities in access to education. Schools across the nation closed in March 2020 and transitioned to online instruction, triggering major concerns about disruptions to learning. Students were projected to return to school in fall 2020 with 63-68% of learning gains in reading and 37-50% of gains in math compared to a typical year.[iv] Historically-underserved student populations—students of color, English Learners,[v] students with disabilities,[vi] and students from low-income families—are especially vulnerable due to a variety of barriers, including lack of access to a device or reliable Internet and unmet need for small-group support. As instruction resumed in fall 2020, some schools started to provide in-person instruction, prioritizing the above high-needs student populations.[vii] Nonetheless, disparities in access to instruction persist. A study estimates that as many as three million students are not attending school, remotely or in person,[viii] and the missing students are disproportionately Black, Latinx, and from low-income households.

The Critical Role of (Missing) Assessment Data

As educators work hard to support students in this challenging time, student achievement data are critical to needs assessment and instructional planning. Teachers need to know their students' academic skills to tailor instruction, and policymakers need data to plan programs and interventions to catch up the students who have fallen behind. With the cancellation of spring 2020 assessments, school districts are relying heavily on diagnostic and/or interim tests administered in fall 2020 to understand students' academic skills. However, fall 2020 assessment results, administered in person or remotely, may not be capturing a large portion of the student population. Many schools are not administering assessments in fall 2020 at all due to technological and other challenges. Within schools that are testing, individual students are absent from school and/or opting out of testing for economic, health, technological, or other reasons unknown to educators and researchers.

Missing assessment data are a critical issue because they can lead to erroneous conclusions and decisions. When students who were not assessed (i.e., students who "attrited", or dropped out of the assessment data) are systematically different from students who were assessed, COVID-19 learning losses, achievement gaps, and other important inferences estimated from the data with such missingness will not reflect the larger student population. The most concerning potential scenario would be that students not testing in fall 2020 are disproportionately those from disadvantaged backgrounds. Not accounting for these students would produce underestimated learning loss and achievement gaps, potentially resulting in under-provision of support and services to the neediest students.

This study used NWEA MAP® Growth™ assessment data to examine the patterns of missing data in fall 2020. The research questions (RQs) were:

1. In all schools that tested in 2019-20, what are the characteristics of students who were tested in 2019-20 but not in fall 2020 (students who attrited)?
2. In schools that tested in both 2019-20 and fall 2020, what are the characteristics of students who attrited?

RQ1 allows us to look at overall attrition from testing, whether by school or individual student. This tells us how the fall 2020 assessment student sample might differ from the fall 2019 sample. RQ2 removes the school selection component by considering only schools that tested students in both fall 2019 and fall 2020, thus focusing on student attrition within the same set of schools.

Data and Methods

This analysis used MAP Growth reading and math assessment data from fall 2019 and fall 2020. The data included about 5.2 million students who attended any grade between kindergarten and seventh grade across 16,172 public schools in fall 2019. We examined students assessed in kindergarten through seventh grade in fall 2019 and compared the characteristics of students assessed in first through eighth grade in fall 2020 ("stayers") and students not assessed in fall 2020 ("attriters"). The analysis was done separately by grade and subject. For each subject-grade, we present summary statistics for all students assessed in 2019 ("all"), stayers, and attriters. These characteristics are: gender, race/ethnicity, fall 2019 achievement measures (mean achievement RIT and median achievement percentile,

achievement decile, and z-score calculated using the 2020 NWEA norms[ix]), and characteristics of the district the students attended: locale (urban, suburban, town, or rural), % American Indian, % Asian, % Black, % Hispanic, % White, % eligible for free or reduced-price lunch (FRPL), % economically-disadvantaged, % English Language Learner, % Special Education, and total enrollment. Summary statistics are unweighted averages (or proportion) of each group (i.e., all, attriters, and stayers). We did not conduct statistical tests of significance because the sample size is large and likely to result in significant results.

We conducted the analysis described above for two samples, corresponding to the research questions. To answer RQ1, we used all schools that tested in fall 2019. This accounts for all attrition from testing, whether by school or individual student. For RQ2, we retained the subset of schools that tested in both fall 2019 and fall 2020. This analysis provides information for individual student attrition within schools that consistently tested, thus holding constant school factors unaccounted for in the RQ1 sample. However, the RQ2 group of schools is unique within the larger sample of NWEA schools, and therefore, less representative.

Summary of Findings

Table 1 presents a summary of characteristics for students in all schools that tested in 2019, pooling all grades. Characteristics are reported separately for all students, attriters, and stayers. The rate of attrition, including school and student attrition, was 49% for math and 47% for reading, a sharp increase from 23% from fall 2018 to fall 2019. Results for individual grades (not reported here, but available upon request) were very similar to the pooled sample. Across subjects and grades, the same pattern was observed: a larger fraction of attriters were racial/ethnic minority students, students with lower achievement in fall 2019, and students in schools with higher concentrations of racial/ethnic minorities and socioeconomically-disadvantaged students. Compared to stayers (and to a lesser extent, all students), attriters were more likely to be Black, less likely to be White, and had lower achievement in fall 2019. In addition, attriters on average attended school in fall 2019 in districts that were more urban, less rural, had higher % Black, higher % Hispanic, lower % White, higher % FRPL and economically-disadvantaged students, and higher total enrollment.

Table 2 presents the same set of summary characteristics for students who attended schools that tested in both fall 2019 and fall 2020, pooling grades and separately for all students, attriters, and stayers. The rate of within-school student attrition was 26% for math and 25% for reading, compared to 15% from fall 2018 to fall 2019. The attrition patterns within these schools were similar to overall attrition described above. A larger proportion of attriters were racial/ethnic minority students and students with lower fall 2019 achievement percentiles. Results for individual grades (not reported here, but available upon request) were very similar to the pooled sample.

Conclusion

Students who were tested in fall 2020 had higher average baseline achievement and were demographically different (e.g., racially less diverse and attend higher socio-economic schools) from students who were not tested. Students who attrited, and thus are missing in the fall 2020 sample, tended to be lower-achieving than students who consistently tested in both fall 2019 and fall 2020. Because the fall 2020 sample does not include these lower-achieving students, analyses comparing achievement patterns in fall 2019 to fall 2020 may underestimate the

magnitude of achievement decline for students. Caution is warranted when interpreting fall 2020 assessment results, especially in comparison to results from prior terms that may include a substantively different group of students, and resource allocation and accountability decisions should consider other data sources (e.g., opportunity-to-learn measures, student grades) when evaluating student performance. Educational leaders should carefully consider the demographic shift in the students who tested as they make decisions on how to best support their students' growth and recovery.

Finally, because a sizable population of the most vulnerable students was left out of assessments altogether, their achievement is not reflected in the data as a result. Students may not have taken the test because they lack reliable technology or because they have disengaged from school due to economic, health, and other factors. Either scenario presents an urgent call for intervention. Educators and policymakers should plan to provide ample support to students who have fallen behind and when in doubt, err on the side of more service and outreach. Interventions need to reach not only the students who are receiving instruction but also students who are not. More coordinated efforts are required to establish communication with students who are not attending school or disengaging from instruction to get them back on track.

Table 1. Student and District Characteristics for All Schools that Tested in Fall 2019

	All		Attriters		Stayers	
Math, All Grades	mean	N	mean	N	mean	N
Student Characteristics						
male	51%	5174977	51%	2516354	51%	2658623
White	47%	5182513	43%	2519975	52%	2662538
Black	16%	5182513	18%	2519975	15%	2662538
Other Ethnicity	13%	5182513	12%	2519975	13%	2662538
Hispanic	19%	5182513	20%	2519975	18%	2662538
Asian	4%	5182513	5%	2519975	4%	2662538
median percentile	55.9	5182513	53.5	2519975	58.1	2662538
decile 1 (.1-10.0)	9%	5182513	10%	2519975	8%	2662538
decile 2 (10.1-20.0)	8%	5182513	8%	2519975	7%	2662538
decile 3 (20.1-30.0)	8%	5182513	9%	2519975	8%	2662538
decile 4 (30.1-40.0)	9%	5182513	9%	2519975	9%	2662538
decile 5 (40.1-50.0)	10%	5182513	10%	2519975	10%	2662538
decile 6 (50.1-60.0)	11%	5182513	11%	2519975	11%	2662538
decile 7 (60.1-70.0)	12%	5182513	11%	2519975	12%	2662538
decile 8 (70.1-80.0)	12%	5182513	11%	2519975	13%	2662538
decile 9 (80.1-90.0)	12%	5182513	11%	2519975	12%	2662538
decile 10 (90.1-99.9)	10%	5182513	10%	2519975	10%	2662538
z-score	0.09	5182513	0.02	2519975	0.14	2662538
District Characteristics						
urban	30%	4839558	36%	2355577	25%	2483981
suburb	37%	4839558	38%	2355577	36%	2483981
town	12%	4839558	10%	2355577	14%	2483981
rural	20%	4839558	15%	2355577	25%	2483981
% American Indian	1%	4850012	1%	2360806	1%	2489206
% Asian	4%	4850012	5%	2360806	4%	2489206
% Hispanic	19%	4850012	20%	2360806	18%	2489206
% Black	16%	4850012	18%	2360806	14%	2489206
% White	60%	4850012	56%	2360806	63%	2489206
% free lunch	41%	4850012	43%	2360806	40%	2489206
% reduced lunch	8%	4850012	8%	2360806	7%	2489206
% free or reduced lunch	49%	4850012	51%	2360806	47%	2489206
% econ. disadvantaged	49%	4849302	51%	2360410	47%	2488892
% English Learners	8%	4848696	9%	2359846	8%	2488850
% Special Educ.	13%	4718727	14%	2321744	13%	2396983
total enrollment	17920	4850012	20563	2360806	15412	2489206

Table 1. Student and District Characteristics for All Schools that Tested in Fall 2019 (Continued)

	All		Attriters		Stayers	
Reading, All Grades	mean	N	mean	N	mean	N
Student Characteristics						
male	51%	5105744	51%	2423492	51%	2682252
White	48%	5113531	43%	2427155	53%	2686376
Black	17%	5113531	19%	2427155	15%	2686376
Other Ethnicity	13%	5113531	12%	2427155	13%	2686376
Hispanic	18%	5113531	19%	2427155	17%	2686376
Asian	4%	5113531	4%	2427155	4%	2686376
median percentile	55.8	5113531	53.2	2427155	58.1	2686376
decile 1 (.1-10.0)	9%	5113531	11%	2427155	8%	2686376
decile 2 (10.1-20.0)	8%	5113531	8%	2427155	7%	2686376
decile 3 (20.1-30.0)	8%	5113531	8%	2427155	8%	2686376
decile 4 (30.1-40.0)	9%	5113531	9%	2427155	9%	2686376
decile 5 (40.1-50.0)	10%	5113531	10%	2427155	10%	2686376
decile 6 (50.1-60.0)	11%	5113531	11%	2427155	11%	2686376
decile 7 (60.1-70.0)	12%	5113531	11%	2427155	12%	2686376
decile 8 (70.1-80.0)	12%	5113531	11%	2427155	13%	2686376
decile 9 (80.1-90.0)	12%	5113531	11%	2427155	13%	2686376
decile 10 (90.1-99.9)	10%	5113531	9%	2427155	10%	2686376
z-score	0.08	5113531	0.00	2427155	0.14	2686376
District Characteristics						
urban	29%	4774190	35%	2267985	24%	2506205
suburb	38%	4774190	39%	2267985	37%	2506205
town	12%	4774190	10%	2267985	14%	2506205
rural	20%	4774190	16%	2267985	25%	2506205
% American Indian	1%	4784606	1%	2273141	1%	2511465
% Asian	4%	4784606	4%	2273141	4%	2511465
% Hispanic	18%	4784606	20%	2273141	17%	2511465
% Black	17%	4784606	19%	2273141	14%	2511465
% White	60%	4784606	55%	2273141	64%	2511465
% free lunch	41%	4784606	43%	2273141	39%	2511465
% reduced lunch	8%	4784606	8%	2273141	7%	2511465
% free or reduced lunch	49%	4784606	51%	2273141	47%	2511465
% econ. disadvantaged	49%	4784019	52%	2272848	47%	2511171
% English Learners	8%	4783347	9%	2272282	7%	2511065
% Special Educ.	13%	4660112	14%	2237201	13%	2422911
total enrollment	17502	4784606	20343	2273141	14931	2511465

Table 2. Student Characteristics for Schools that Tested in Fall 2019 and Fall 2020

	All		Attriters		Stayers	
Math, All Grades	mean	N	mean	N	mean	N
Student Characteristics						
male	51%	2838406	51%	740928	51%	2097478
white	50%	2842861	44%	742259	52%	2100602
Black	16%	2842861	20%	742259	15%	2100602
other ethnicity	12%	2842861	12%	742259	13%	2100602
Hispanic	19%	2842861	20%	742259	19%	2100602
Asian	4%	2842861	4%	742259	4%	2100602
median percentile	56.8	2842861	52.0	742259	58.3	2100602
decile 1 (.1-10.0)	9%	2842861	11%	742259	8%	2100602
decile 2 (10.1-20.0)	7%	2842861	9%	742259	7%	2100602
decile 3 (20.1-30.0)	8%	2842861	9%	742259	8%	2100602
decile 4 (30.1-40.0)	9%	2842861	9%	742259	9%	2100602
decile 5 (40.1-50.0)	10%	2842861	10%	742259	10%	2100602
decile 6 (50.1-60.0)	11%	2842861	10%	742259	11%	2100602
decile 7 (60.1-70.0)	12%	2842861	11%	742259	12%	2100602
decile 8 (70.1-80.0)	12%	2842861	11%	742259	13%	2100602
decile 9 (80.1-90.0)	12%	2842861	11%	742259	12%	2100602
decile 10 (90.1-99.9)	10%	2842861	9%	742259	11%	2100602
z-score	0.11	2842861	-0.02	742259	0.15	2100602

Table 2. Student Characteristics for Schools that Tested in Fall 2019 and Fall 2020 (Continued)

	All		Attriters		Stayers	
Reading, All Grades	mean	N	mean	N	mean	N
Student Characteristics						
male	51%	2754533	51%	686573	51%	2067960
White	51%	2758973	44%	687758	53%	2071215
Black	16%	2758973	20%	687758	15%	2071215
Other Ethnicity	13%	2758973	13%	687758	13%	2071215
Hispanic	18%	2758973	19%	687758	17%	2071215
Asian	4%	2758973	4%	687758	4%	2071215
median percentile	56.9	2758973	51.7	687758	58.5	2071215
decile 1 (.1-10.0)	9%	2758973	12%	687758	8%	2071215
decile 2 (10.1-20.0)	7%	2758973	9%	687758	7%	2071215
decile 3 (20.1-30.0)	8%	2758973	9%	687758	8%	2071215
decile 4 (30.1-40.0)	9%	2758973	9%	687758	8%	2071215
decile 5 (40.1-50.0)	10%	2758973	10%	687758	10%	2071215
decile 6 (50.1-60.0)	11%	2758973	11%	687758	11%	2071215
decile 7 (60.1-70.0)	12%	2758973	11%	687758	12%	2071215
decile 8 (70.1-80.0)	12%	2758973	11%	687758	13%	2071215
decile 9 (80.1-90.0)	12%	2758973	11%	687758	13%	2071215
decile 10 (90.1-99.9)	10%	2758973	8%	687758	10%	2071215
z-score	0.10	2758973	-0.04	687758	0.15	2071215

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