The impact of missing data on our understanding of academic progress during the COVID-19 pandemic

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How are students faring academically during the COVID-19 pandemic?

+ Initial evidence is beginning to emerge on students' academic achievement during the COVID-19 pandemic

+ However, it has been estimated that approximately 3 million students stopped attending school in March and may still be unaccounted for.

+ *Motivating question:* How can we ensure that our estimates of learning during COVID-19 are inclusive of the most vulnerable students (who may be least likely to show up in our data)?

MAP Growth assessments

+ In this study, we are using test scores from NWEA's MAP Growth assessments

    – Computer-based interim assessments typically administered in fall, winter, and spring

    – Administered in grades K-8 in public and private schools across the country

    – Aligned to state math and reading content standards

+ Schools had the option to test remotely or in-person in fall 2020

Research Questions

1. Who is missing from MAP Growth testing this fall?

2. How sensitive are our results on students' academic progress during the COVID-19 pandemic to accounting for these missing students?

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Understanding the missing data patterns in fall 2020

+ We examined attrition patterns among 5.2 million students in 16,000 US public schools who tested during the 2019-20 school year

1. **School attrition:** School/district opted out of testing this fall

2. **Student attrition**: School offered MAP Growth but a given student did not test this fall (due to technology challenges, unenrolling from public schools, opting out, etc.)

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# How did student-level attrition vary by student characteristics?
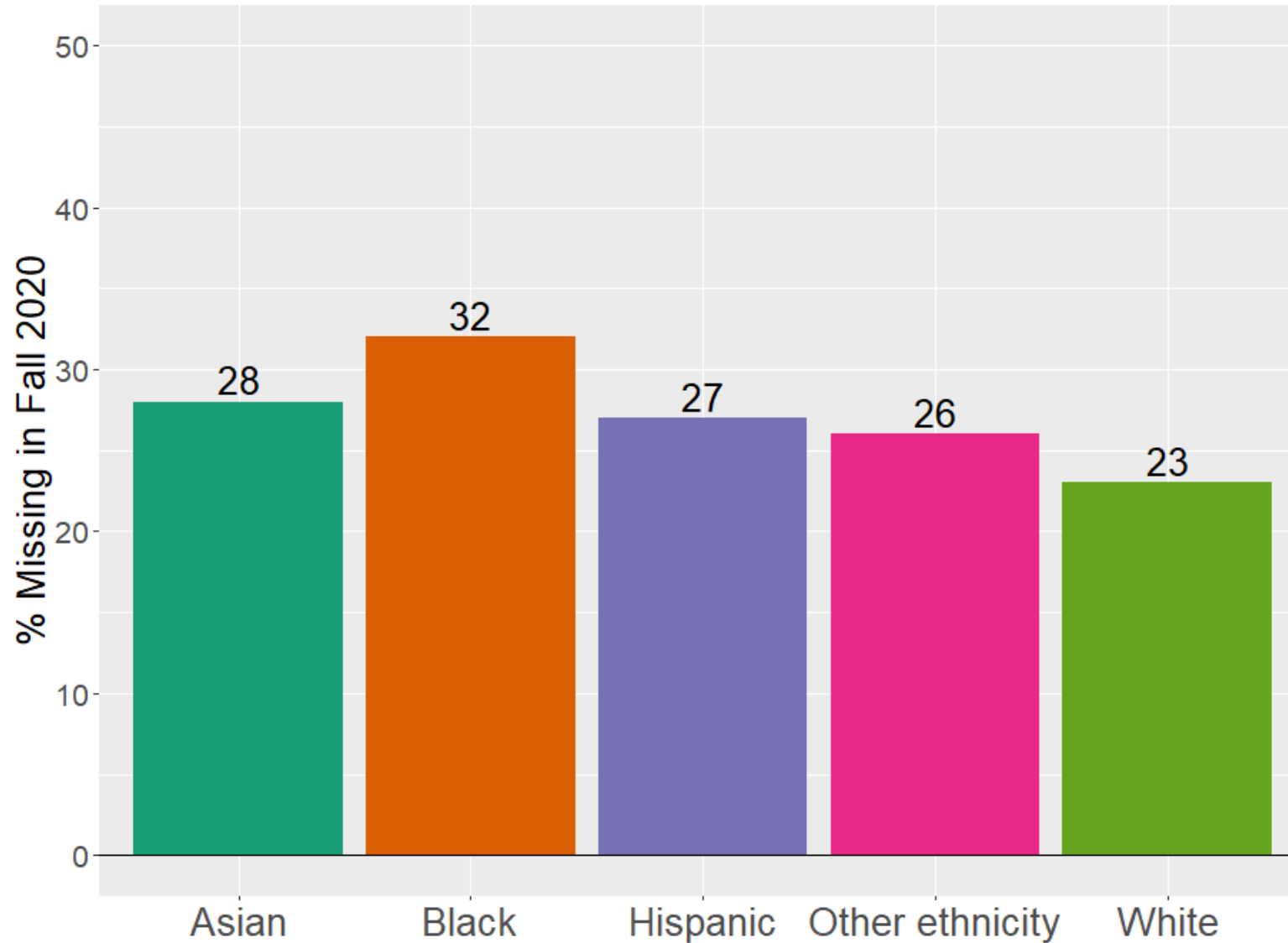
Bounding our estimates of COVID-19 learning loss

+ First, we compared fall 2019 and fall 2020 with observed data only

+ Second, we considered four scenarios to fill in missing fall 2020 data:

1. Substitute with the missing students' fall 2019 percentiles

2. Substitute with the fall 2019 percentiles adjusted downwards by subtracting the median observed drop

3. Substitute with the median fall 2020 percentile of their same grade-gender-race peers

4. Substitute with the median fall 2020 percentile of their same grade-gender-race peers adjusted downwards.

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How sensitive are our findings to student-level attrition?

Change in Percentile Rank Between in Fall 2019 and Fall 2020
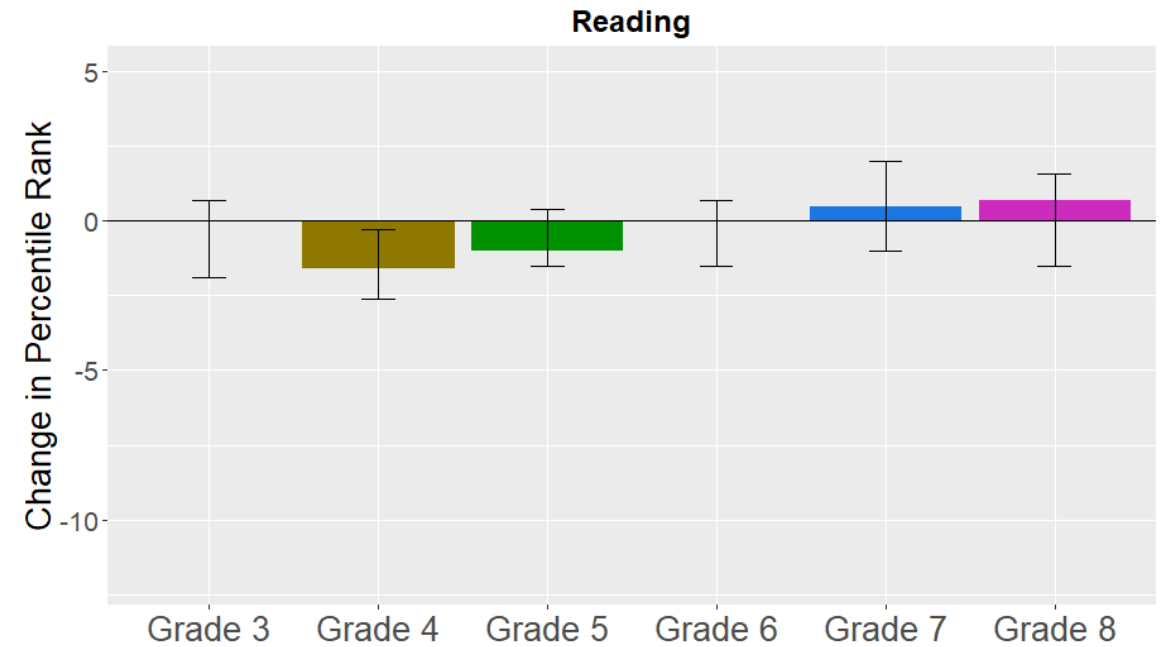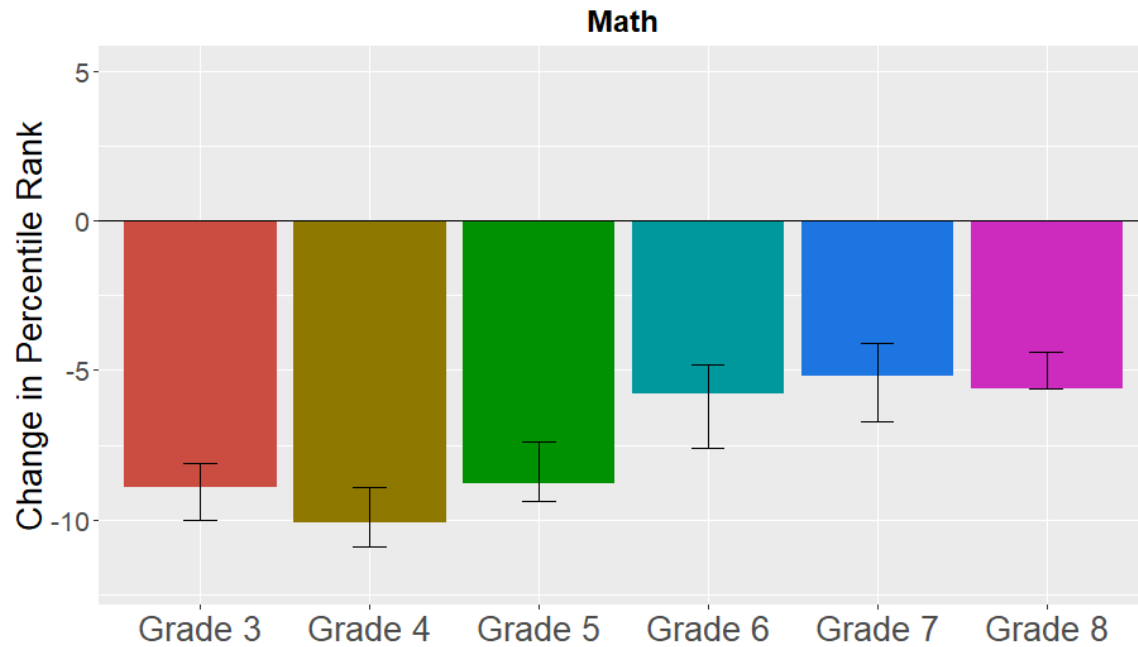
Thank you for listening!

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For more information, see nwea.org/covid-impact

Who is missing from MAP Growth testing this fall?

+ Across subjects and grades, a larger fraction of students who did not test in fall 2020 were:

  + ethnic/racial minority students

  + students with lower achievement in fall 2019

  + students in schools with higher concentrations of socio-economically-disadvantaged students.

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How did student-level attrition vary by student characteristics?

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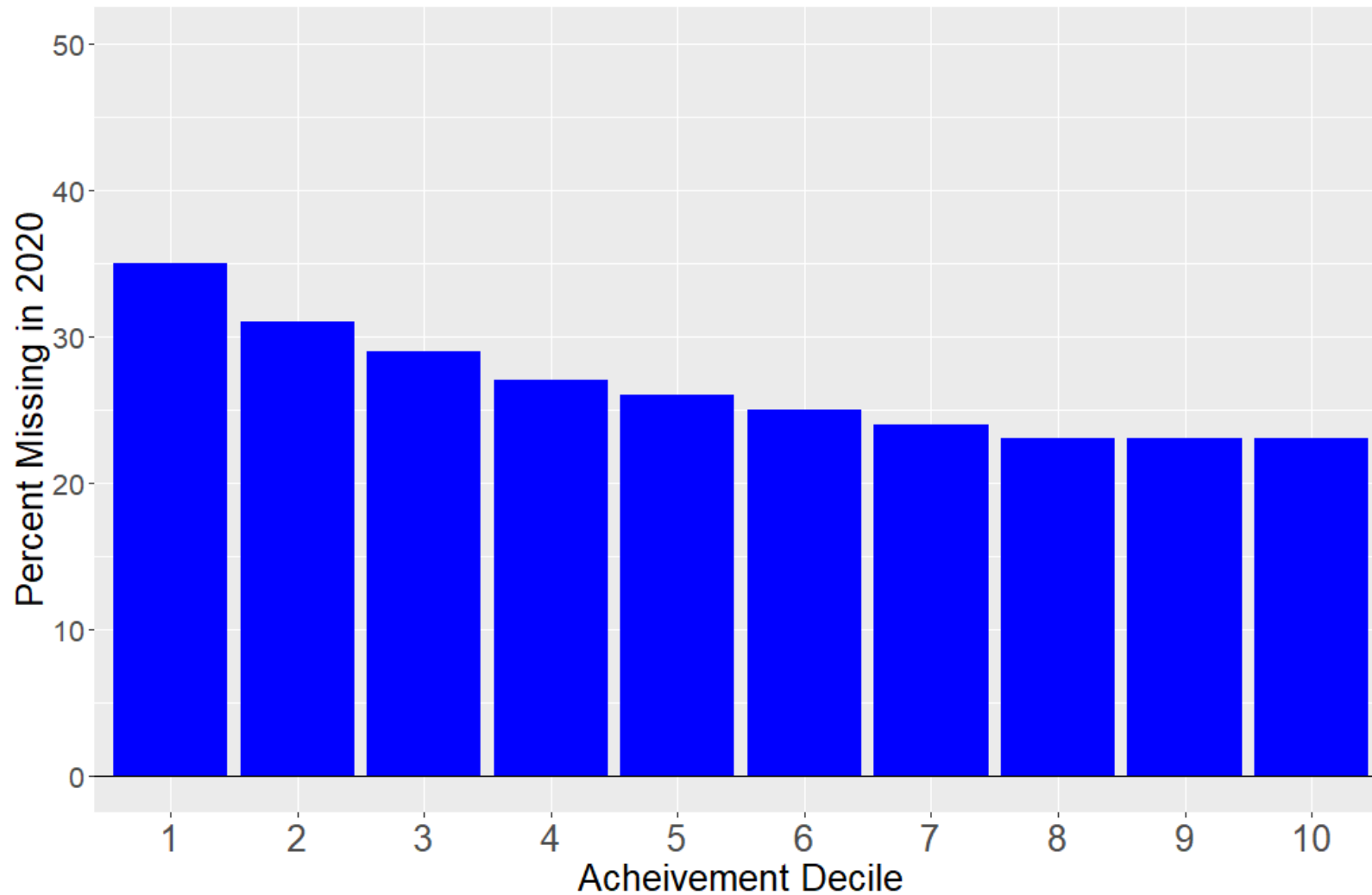
# What percentage of students attrited by various characteristics?

| Student Characteristic	All students who tested in fall 2019	Students in schools that tested in fall 2019 & fall 2020
Male	49%	26%
Female	49%	26%
White	44%	23%
Black	54%	32%
Hispanic	50%	27%
Asian	53%	28%
Other ethnicity	48%	26%

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What percentage of students attrited by various characteristics?

Fall 2019 achievement decile	All students who tested in fall 2019	Students in schools that tested in fall 2019 & fall 2020
decile 1 (.1-10.0)	56%	35%
decile 2 (10.1-20.0)	53%	31%
decile 3 (20.1-30.0)	51%	29%
decile 4 (30.1-40.0)	50%	27%
decile 5 (40.1-50.0)	49%	26%
decile 6 (50.1-60.0)	47%	25%
decile 7 (60.1-70.0)	46%	24%
decile 8 (70.1-80.0)	46%	23%
decile 9 (80.1-90.0)	45%	23%
decile 10 (90.1-99.9)	46%	23%

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Compared to fall 2019, student achievement this fall was, on average, 5 to 10 percentile points lower in math, but similar in reading

Math
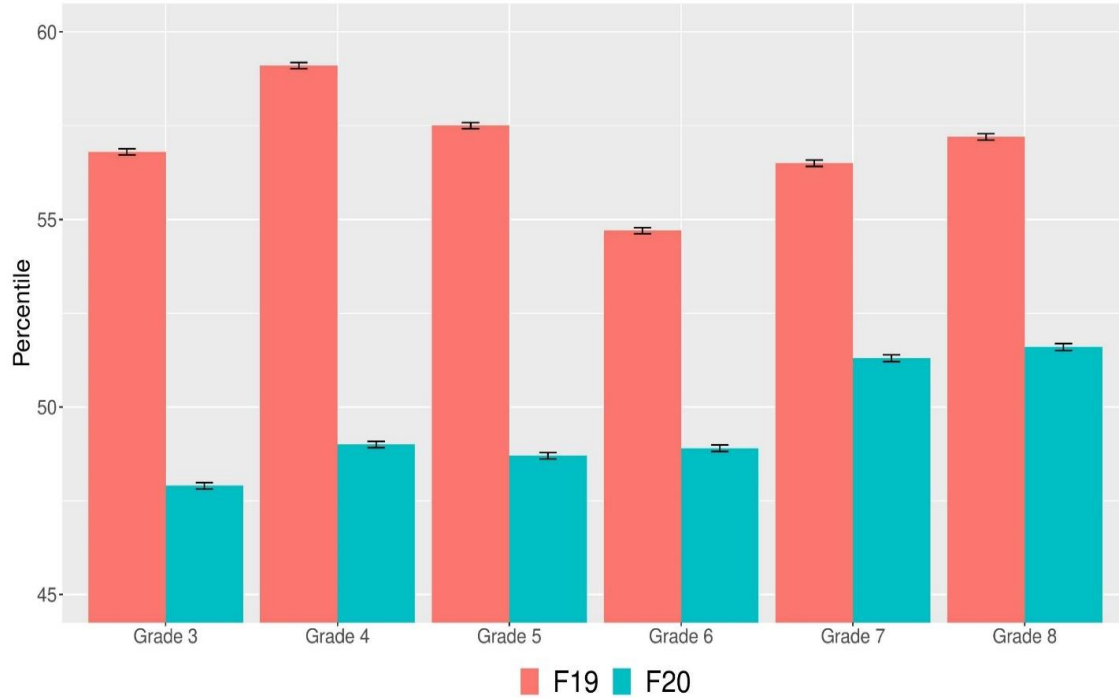
Reading
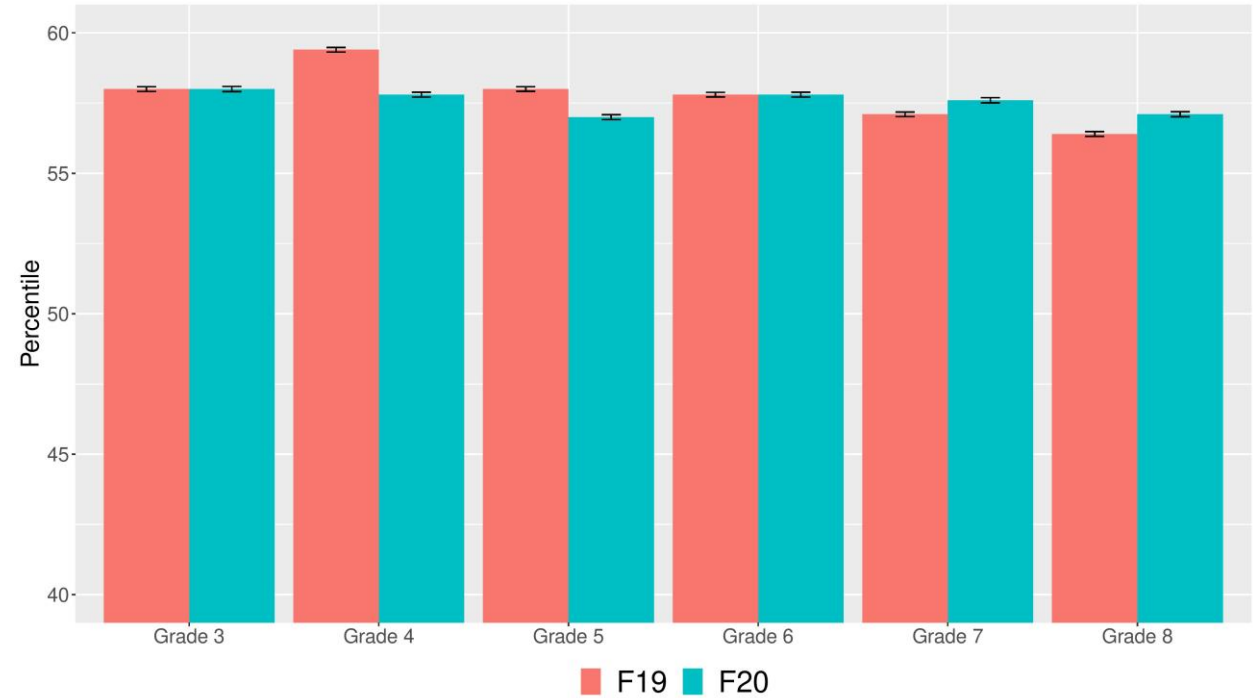
MAP Growth achievement percentiles by grade level in Fall 2019 and Fall 2020