



Flaking Out: Student Absences and Snow Days as Disruptions of Instructional Time

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Link: <http://scholar.harvard.edu/files/joshuagoodman/files/absences.pdf>

Key Findings

Increasing instructional time through lengthening the school day or year is often discussed as one way to improve student performance. Little attention has, however, been paid to student attendance. This study explores the impact of instructional time disruptions, including student absences and school closures due to snow days. It finds that:

- The average Massachusetts student misses 10 days of school a year, eight of which are due to absences and only two of which are due to school closures (snow days).
- A student's achievement is hurt by his own absences, as well as by those of his peers.
- Low income students have higher absence rates than non-low income students and are more likely to have very high numbers of absences (30 to 60) in a year. The study's estimates suggest that one-fourth of the achievement gap by income is accounted for by attendance.
- School closures (snow days) have no discernible impact on student achievement overall, though a small impact is observed in the lowest income schools. Absences because of moderately heavy snowfall that does not cause a school closure, however, are even more harmful than the typical absence, at least in math.
- Teachers appear to deal well with coordinated disruptions of instructional time like snow days but deal poorly with disruptions like absences that affect different students at different times.

Research Questions

This study documents basic patterns of attendance and school closures, as well as asking how those factors are related both to weather and to student achievement. Questions asked include:

- How much school do students in Massachusetts miss due to absences and school closures?
- Do such patterns differ by student demographics, such as income, race or gender?
- Does bad weather, such as snowfall, affect student attendance rates? Which students are most likely to miss school due to bad weather?
- Is there a relationship between student absences and achievement?
- Is there a relationship between school closures (snow days) and achievement?



Data

This study uses ESE's student-level data on attendance (SIMS) and achievement (MCAS). SIMS end-of-year files include the number of days enrolled and the number of days in attendance, the difference between which represents absences. Students with over 60 absences in a year were excluded to diminish the influence of outliers. Because ESE does not collect school closure data, the author requested historical closure data directly from all Massachusetts school districts, roughly half of which responded. Snowfall data were collected from the National Oceanic and Atmospheric Administration's Climate Data Online, which reports weather recorded daily by sensors scattered throughout Massachusetts.

Research Methods

To account for the fact that students and schools with low attendance rates may differ in many ways from those with high attendance rates, this study uses student and school fixed-effects regressions, which compare students and schools to themselves over time. Using an instrumental variables model, the study also takes advantage of the essentially random impact of moderate and heavy snowfall on school attendance to measure the impact of attendance on student outcomes.

Detailed Results

This study estimates that:

- A school whose attendance rate decreases by one day per year is predicted to have test scores that decrease by 0.02 standard deviations. Half of this comes from the effect of a student's own absences and the other half comes from the effect of his peers' absences.
- Moderately heavy snowfall induces students, particularly low income students, to be absent. Each additional absence induced by snowfall decreases math achievement by a substantial 0.05 standard deviations. Impacts on ELA achievement are negative but statistically insignificant.
- Closures generally have little effect on achievement except in schools with large shares of low income students, where each closure reduces math and ELA achievement by 0.01 to 0.02 standard deviations.

Implications for Policy and Practice

Increasing instructional time may not necessarily require lengthening the school day or year, as some gains may be made by increasing attendance during already scheduled instructional time. Improved attendance could benefit all students given spillover effects from absent peers, but could particularly benefit low income students, who have both high absence rates and peers with high absence rates.

Schools and teachers seem well prepared for coordinated disruptions such as closures due to snow. They do not, however, deal well with less dramatic but more frequent disruptions caused by student absences. Gains may come from developing techniques for helping students who have missed lessons due to poor attendance. Self-paced learning technologies may reduce the impact of absences by shifting the classroom model to one in which not all students must learn the same lesson at the same time.