**Income-Based Inequality in Educational Outcomes:
Learning from State Longitudinal Data Systems**

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# Key Findings

We study the income-based gaps in educational attainments among students in Massachusetts over the past decade. We find that:

* There are large gaps in educational attainment by income. For instance, low income students are 20 percentage points less likely to graduate from high school on time, and 31 percentage points less likely to enroll in college.
* Income-related gaps in both educational credentials and academic skill have narrowed substantially over the past several years in Massachusetts.
* The amount of time a student spends in the state public school system appears to make a difference, with much narrower gaps the longer students spend in the system.

# Research Questions

We address three broad questions:

1. How do the educational attainments of Massachusetts students from low-income families compare to those of their peers from more affluent families?
2. Does information on achievement and school attachment gaps present before entry into high school account for much of the income-related gaps in educational attainments?
3. How have the educational outcomes of low-income students in Massachusetts changed over the past decade, both absolutely and relative to those of higher-income students?

# Data

To address our research questions, we have integrated student demographic and achievement data from the state’s longitudinal data system and information on post-secondary attainment from the National Student Clearinghouse. We focus on students who were first-time eighth graders in the 2003 through 2008 school years.

# Research Methods

To examine income-related gaps in educational attainments and trends over time, we use simple cross-tabulations. To examine the extent to which income-related gaps in attainments can be accounted for by eighth grade attendance and test scores, we use ordinary least squares regression. Finally, we use a regression-discontinuity design to analyze the effect of barely failing the 10th grade exit examination on students’ educational attainments. On the test, students scoring just on either side of the cutoff have similar academic skills, but are assigned to a different status. We look for a difference in the probability of attending college between students on either side of the cut score.

# Detailed Results

In Massachusetts, higher income students graduate from high school, attend college, and persist in college at greater rates than their low income peers.

* Income gaps increase as attainments rise: there is a 20 percentage point gap in high school graduation rates, a 31 percentage point gap in college-going, and a 39 percentage point gap in four-year college attendance.
* Nearly 65 percent of higher-income eighth graders go on to attend a four-year college, compared to fewer than 25 percent of low-income students.
* Among the 2003 eighth graders, 37 percent of higher-income students graduated from a four-year college within four years, compared to just 8 percent of low-income students.

We provide evidence on several possible explanations for why gaps could emerge, persist, and worsen:

* Low-income students enter high school with much weaker skills (as measured by test scores) and poorer school attendance than higher-income students.
* Low-income students tend to attend high schools serving other low-income students.
* Low-income students perform worse on exit examinations than higher-income students and failing the test matters more for their ultimate educational attainments.

We also document important progress over time.

* The gap in four-year graduation rates has fallen from 27 percentage points for students who were in eighth grade in 2003 to 22 percentage points for the cohort of eighth graders in 2008.
* The achievement gap between low income and higher income students closes the longer students spend in the state’s public school system. For example, among students who entered the system in fourth grade, the gap narrowed from 0.94 standard deviations in fourth grade to 0.68 standard deviations in 10th grade, a reduction of more than 0.25 standard deviations.
* Low-income students are passing the tenth grade exit examinations on their first attempt at much higher rates than they were ten years ago, and the income-based gap in passing rates has narrowed substantially from 30 percentage points to 12 percentage points.
* The estimated effect of barely failing the test for low-income students fell from approximately 4 percentage points in 2004 to 1 percentage point or less in 2008. Failing the test poses less of a hurdle to graduation for low income students today.

# Implications for Policy and Practice

Even when we compare students in the same high school with similar characteristics, eighth grade test scores, and eighth grade attendance, large income-based gaps in subsequent attainments remain. Clearly the effects of poverty (or its correlates) produce substantial disadvantages in educational attainments for low income youth. However, the analyses we conducted provide evidence that the educational system in Massachusetts has made substantial progress in reducing educational inequalities and in improving the life chances of low income students.