

Stuck Schools

A framework for identifying schools where students need change—now!



The Education Trust

TO THE POINT

- ▶ As our nation's struggling schools attract greater attention and investments, education leaders need to understand trends in school performance over time.
- ▶ Not all low-performing schools are the same. Some remain stuck year after year, while others that started as low performers are among the fastest improvers in their state.
- ▶ Educators and policymakers can use the Stuck Schools framework to identify schools worthy of study as well as those in need of intervention.

The Stuck Schools analysis offers a simple, transparent way of gauging patterns of school performance and improvement. It shines a light on a relatively small number of schools that started out low performing and have made little or no gains in subsequent years—schools that clearly need state or district attention. Tracking actual proficiency rates and their improvement over time can help decision makers focus scarce resources on a limited number of struggling schools and the students they serve.

Stuck Schools

A framework for identifying schools where students need change—now!

BY NATASHA USHOMIRSKY AND DARIA HALL

Consider two middle schools in Maryland. At both, low-income kids and kids of color constitute the majority of the student population. In 2005, about one-third of the students at each school tested proficient in reading on the Maryland State Assessment. By 2009, however, 64 percent of students at one school reached proficiency, while proficiency rates remained below 40 percent at the other.

To be sure, a 64 percent proficiency rate is not nearly good enough. Yet gains of eight percentage points per year (some of the highest in Maryland) suggest that something positive may be happening at this school. In contrast, little appears to have changed at its counterpart, where annual gains averaged less than a percentage point for five consecutive years. Both schools may require additional help and resources, but their needs probably differ in type and intensity.

A lot of claims and counterclaims are being made about how much America's schools—especially our low-performing schools—are improving. Some argue our country has made literally no progress on this issue, either because we don't know how to improve schools or because we don't care enough to do it to scale. Others say things are getting better across the board, pointing to what they see as unprecedented gains in initially low-performing schools over the past few years.

In recent months, the federal government has put billions of dollars on the table with a demand for real action in turning around our country's lowest performing schools. At the same time, federal and state leaders are considering future directions for education policy. In this context, understanding recent patterns of school improvement is particularly important.

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To help inform that conversation, we have explored data on reading and mathematics performance over time in ten states. In each state, we identified elementary and middle schools where math or reading-proficiency rates a few years ago ranked among the lowest. Then we examined the extent to which these initially low-performing schools raised or failed to raise students' reading and math performance during subsequent years.

In virtually every state, the story parallels that of the two Maryland middle schools: Some schools are improving; others are stuck.

The data convey some important messages. On the one hand, the notion that no one knows how to improve

The Stuck Schools Series

The four papers in the Stuck Schools Series provide educators, policymakers, and the public with a framework for using data to identify schools and districts that are making academic progress or that desperately need help.

- This paper, the first in the series, looks at trends in overall performance and improvement over time. It examines data from two states to determine what performance looked like several years ago, the extent of annual gains at high-improving and low-improving schools, and how many of these lowest performing schools remained stuck, made extraordinary gains, or fell somewhere in between.
- The second paper will look beyond overall test scores and consider the performance of subgroups of students.
- The third will explore what the data say about performance and improvement trends across districts. For example: Are some districts more successful than others in moving low-performing schools?
- Finally, a fourth paper will address the public-policy implications of these analyses.

low-performing schools doesn't hold up. Degrees of progress differ from state to state, but a substantial number of schools in nearly every state are making great strides. Of course, rising test scores alone are insufficient cause for celebration: It's important to identify the instructional practices that are spurring these results. But the data indicate that some schools have the capacity and knowledge to drive success. It's essential to find out what these schools are doing right and replicate the practices that lead to meaningful, sustained gains for all students.

But let's not kid ourselves. Academic performance and improvement still fall short of where they should be, and progress differs drastically among the states. For example, on average, reading and math proficiency rates in Maryland have improved substantially in recent years, yet in other states—Indiana, for example—average performance has remained flat.

What's more, every state has a group of schools that started out low performing and proceeded to show little improvement—or all too often, lose ground. These schools are stuck—trapped at the bottom and unable or unwilling to improve—and tens of thousands of students are stranded inside their classrooms. Identifying these schools and either helping them improve or forcing them to close, with students removed to higher performing schools, is an economic and moral imperative.

With the focus of the American Recovery and Reinvestment Act (ARRA) on struggling schools and reauthorization of the Elementary and Secondary Education Act (ESEA) on the horizon, now is the time to have an honest conversation about what we know—and don't know—about school-

The notion that no one knows how to improve low-performing schools doesn't hold up. Degrees of progress differ from state to state, but a substantial number of schools in nearly every state are making great strides.

level trends. To spur this conversation and to help state and local leaders think about how to look at their own data, The Education Trust will publish a series of papers that analyze school performance and improvement.

In this paper, the first in the series, we look at trends in overall performance and improvement over time. We examine data from two of the ten states we looked at to explore the following questions: What did performance look like several years ago? How big were the annual gains at high-improving schools? How about at low-improving ones? Among the lowest performing schools, how many remained stuck, how many made extraordinary gains, and how many fell somewhere in between?

FINDING THE STUCK SCHOOLS

What follows is a brief overview of how we analyzed data from Maryland and Indiana, our example states; Appendix I provides additional detail, including all data sources.

Using publicly available data, we calculated school-level aggregate proficiency rates in reading and math for five consecutive years (2004-08 in Indiana and 2005-09 in Maryland).¹ After eliminating schools that were missing data for one or more years, we calculated the baseline proficiency rate and average annual improvement rate for each school in each subject.² We then ranked schools by their baseline proficiency rates, identifying schools that were high performing (top quartile), average (middle 50 percent), and low performing (bottom quartile) in reading and math, respectively. This gave us a picture of the range of performance across the state.

Next, we ranked schools by their improvement rates (ignoring their performance for the moment) and identified schools that were high improving, average, and low

Clarifying Our Terms

The terms *performance*, *proficiency rates* (or *percent proficient*), *passing rates* (or *percent passing*), and *test results* all refer to the percentage of students who earned proficient scores or higher in reading or mathematics on a state test in a given year.

Similarly, the terms *gains* and *improvement* both mean the increase or decrease in the percentage of students proficient in reading or math from year to year.

High-performing, *average*, and *low-performing schools* refer to schools that in the baseline ranked in the top quartile, middle 50 percent, and bottom quartile of performance, respectively. *High-improving*, *average*, and *low-improving schools* refer to schools whose gains from 2005-09 ranked in the top quartile, middle 50 percent, and bottom quartile of improvement.

improving in each subject—that is, in the top quartile, middle 50 percent, or bottom quartile of improvement. This helped us better understand the kinds of improvement trajectories seen in schools.

Finally, we combined these two analyses to find out how schools that were low performing in a given subject in the baseline ranked in terms of improvement in that subject. This allowed us to identify two sets of schools—those that started out low performing but were among the top gainers in the state (though often still short of their potential) and those that started out low performing and have improved more slowly than 75 percent of schools in the state. This latter group comprises the stuck schools.

WHAT THIS ANALYSIS DOES—AND DOESN'T DO

This analysis offers a simple, transparent way of gauging the patterns of school performance and improvement in a state. It shines a light on a relatively small number of schools that started out low performing and have made little to no gains in subsequent years—schools that clearly need state or district attention. In doing so, this analysis demonstrates that tracking a combination of actual proficiency rates and their improvement over time can help educators and policymakers focus the scarce resources of a district or state on a limited number of struggling schools and the students they serve.

Of course, this analysis alone cannot determine which schools to close or target for turnaround. For one, it does not take subgroup performance into account, and schoolwide averages can mask huge gaps between groups of students. (The second paper in the series examines the issue of subgroup achievement.) The analysis also is based entirely on state assessment results, which come with their own limitations. In addition, proficiency rates of small schools can fluctuate a great deal from year to year.

Moreover, this analysis is meant to bolster—not confuse—the accountability and school-identification policies already in place through the ESEA and the ARRA. Our approach to looking at achievement data compares schools with one another, rather than against a set standard. The Adequate Yearly Progress (AYP) provisions of the ESEA, on the other hand, use a target benchmark-proficiency rate and evaluate all subgroups of students against that common standard to determine each school's status. Under AYP, a school's status is based on its own performance against a set target, whereas our analysis bases a school's status on its performance relative to other

schools in the state. Because of these differences and other complexities of AYP, our analysis and the AYP formula identify somewhat different groups of schools as needing support, though considerable overlap exists between the two approaches.

While similar in intent to the turnaround provisions of Race to the Top and School Improvement Grants, this analysis will not necessarily yield the 5 percent of schools the Obama Administration hopes to address with these programs. In some states, our approach will identify far more schools; in others, far fewer. Regardless, state officials can use this framework to help identify schools in need of intervention and those that have lessons to offer.

PATTERNS IN MARYLAND AND INDIANA

This paper examines elementary and middle school performance over time in Maryland and Indiana. We selected these states because they illustrate contrasting patterns of performance and improvement—patterns that, to various degrees, are evident in multiple states and subject areas.

A caveat: Because of differences in content and performance standards, as well as the different years of data included in the analysis, we cannot compare one state's achievement and improvement results with another's. We are not seeking to determine that one state is doing better or worse than another but rather to provide educators and policymakers with examples of what to seek—and watch out for—in their own data.

That said, at least according to a recent study by the Nation Center for Education Statistics (NCES),³ reading performance standards in Maryland and Indiana are not drastically different in terms of difficulty. And while according to NCES, Indiana's fourth-grade math performance standards are substantially higher than Maryland's, its eighth-grade standards are actually somewhat lower. Our discussion focuses primarily on results in reading; mathematics charts and tables for both states are available in Appendix II.

MARYLAND: MANY GAIN, SOME STAGNATE⁴

Our analysis for Maryland included 2005-09 assessment results for 1,066 schools serving any combination of grades 3-8. It excluded any schools that served one or more high school grades (9-12), as well as alternative schools and schools where 50 percent or more students received special education services.⁵

Figure 1: Baseline (2005-07) Reading Proficiency Rates of Maryland's High-Performing, Average, and Low-Performing Schools

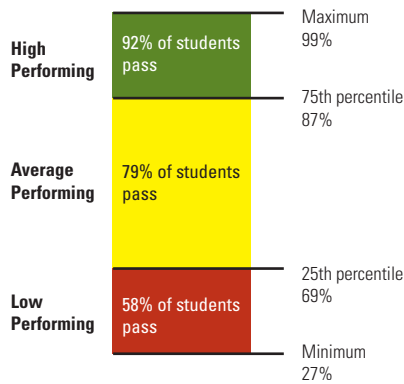
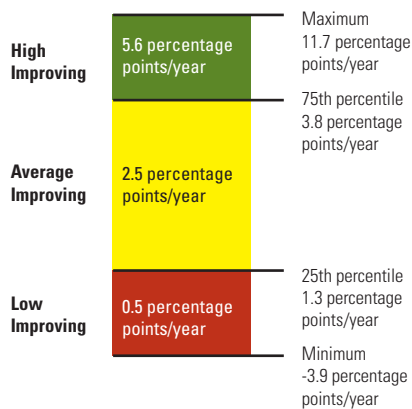


Figure 2: 2005-09 Improvement Rates at Maryland's High-Improving, Average, and Low-Improving Schools: Reading



Baseline Reading Performance. On average, during the 2005-07 baseline period, 77 percent of Maryland's third-grade to eighth-grade students passed the Maryland State Assessment (MSA) in reading. At high-performing schools (schools whose proficiency rate surpassed the 75th percentile school's), an average of 92 percent of students were proficient in reading. The average proficiency rate at the middle 50 percent of schools was 79 percent. At low-performing schools (schools whose proficiency rate was lower than the 25th percentile school's) only 58 percent of students, on average, passed the MSA (see Figure 1).

2005-09 Improvement. From 2005-09 in Maryland, the percentage of elementary and middle school students who scored proficient or above in reading on the MSA

Figure 3: Demographics of Maryland's High-Performing, Average, and Low-Performing Schools: Reading

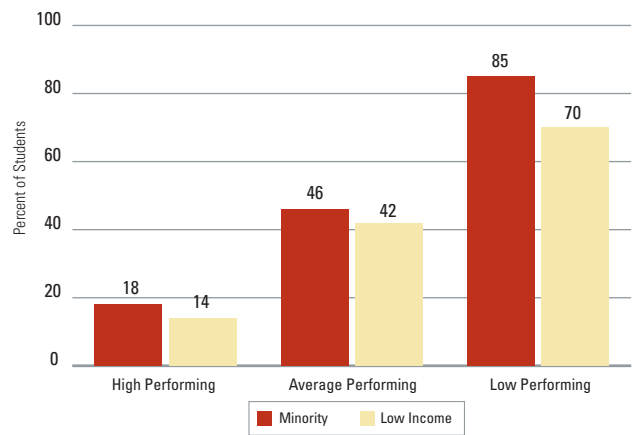
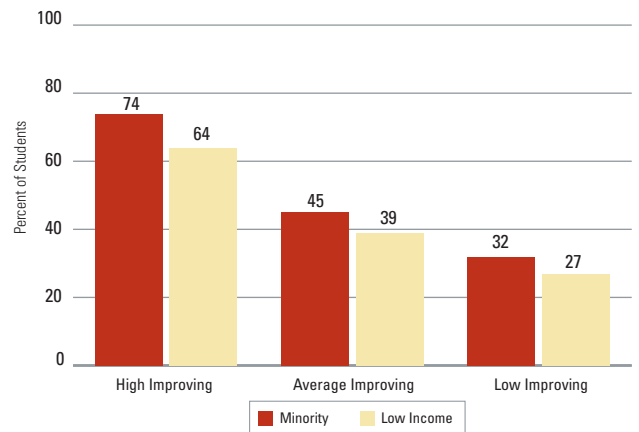


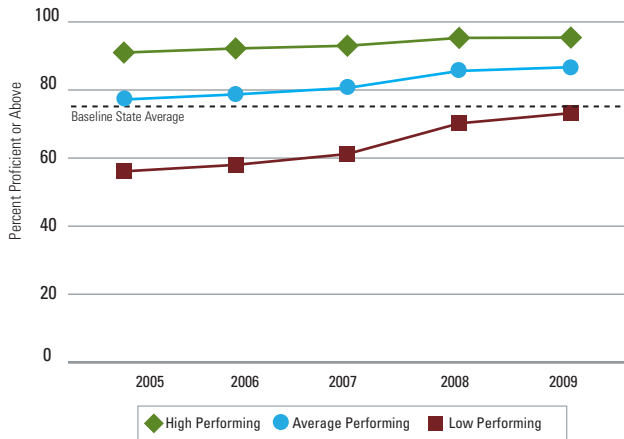
Figure 4: Demographics of Maryland's High-Improving, Average, and Low-Improving Schools: Reading



increased on average by about 2.8 percentage points per year. The highest improving 25 percent of schools gained an average of 5.6 percentage points per year, or more than 20 percentage points over this period. Low-improving schools (schools in the bottom quartile of improvement), on the other hand, gained only about one-half a percentage point per year on average—or about two percentage points over the entire five years (see Figure 2).

Demographics of Schools Differing in Performance and Improvement. Figure 3 shows the demographics of high-performing, average, and low-performing schools. Dishearteningly, but not unexpectedly, schools in the bottom quartile of performance have the highest percentages of minority and low-income students.

Figure 5: 2005-09 Reading Performance of Maryland High-Performing, Average, and Low-Performing Schools



In contrast, the demographics of high-improving, average, and low-improving schools (see Figure 4) show the opposite pattern: High-improving schools have the highest percentages of low-income and minority students. The fact that schools serving low-income students and students of color are more likely to be high-improvers than other schools offers an encouraging sign of progress toward the goal of closing achievement gaps.

Where Schools at Different Performance Levels Started and Ended Up. Figure 5 shows how schools that started out high performing, average, and low performing fared on the MSA during 2005-09. On average, the news is quite good: Schools at each level of performance generally made progress, with low-performing schools making the biggest gains.

While this may seem obvious—schools that start the lowest have the most room to improve—not all schools that begin low make gains. As Figure 6 shows, about 64 percent of Maryland’s low-performing elementary and middle schools rank as high improving (meaning, they are improving faster than three-fourths of the schools in the state). Another 77 schools, or 29 percent of the total, show up as average-improving. But 19 schools, 7 percent of the low performers, are also among the slowest improving in the state. During 2005-09, these 19 schools gained less than half a percentage point on average, and some have consistently declined in performance.

Figure 7 highlights the divergent trends among the 267 schools that started out as low performing. The highest

Figure 6: Number of Low-Performing Schools That Are High-Improving, Average, and Low-Improving: Reading

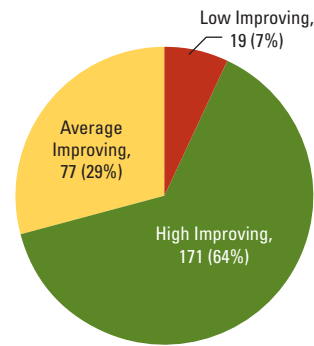
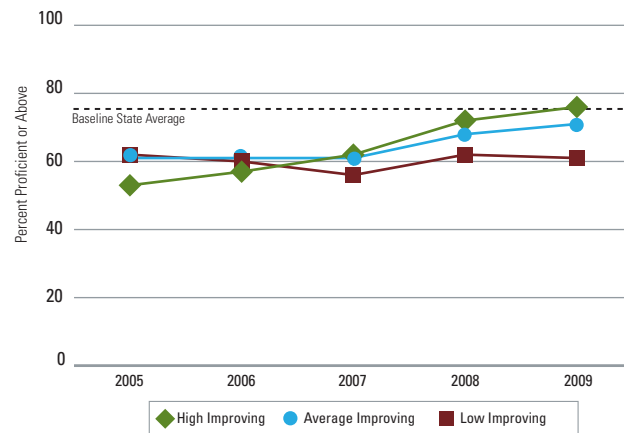


Figure 7: 2005-09 Reading Proficiency Rates of Maryland’s Low-Performing Schools Showing High, Average, and Low Improvement



improving among them attained a 76 percent proficiency rate, on average, by 2009—almost reaching the baseline state average. But the lowest improving stagnated at just about 60 percent proficiency. In other words, while some schools that started low-performing have made substantial progress, others have made no gains at all. And notably, among this low-improving group, some schools began and ended in the 30 percent to 40 percent proficient range.

When Gains Aren’t Enough: Chronically Low-Performing Schools. Our “stuck schools” definition identifies schools that started out performing poorly and improved more slowly than three-fourths of all schools in the state over a period of five years. This definition includes many schools

that showed limited to nonexistent improvement, but it fails to capture schools that remain among the lowest performing in the state, despite making slightly higher gains. When a school continues to deliver worse results than the vast majority of schools in the state year after year, its status at the bottom of the performance continuum should spark notice, even if it is making some gains. Such schools are chronically low performing and need attention, despite the fact that they are not “stuck.”

To identify Maryland’s chronically low-performing schools, we looked for schools whose 2007, 2008, and 2009 proficiency rates stayed consistently below the performance of the fifth-percentile school in the baseline. (See the sidebar, “Using Baseline Performance as a Ruler.”) In 2007, 40 schools fell below this benchmark for reading. Of these, seven schools performed below this benchmark in 2008 and 2009 as well (Figure 8).

Tallying Stuck and Chronically Low-Performing Schools.

By looking at reading performance over time, we have identified 19 Maryland schools that are stuck and seven that are chronically low performing. Figure 9 shows some overlap between these two groups of schools, however. In

Figure 8: Maryland’s Chronically Low-Performing Schools: Reading

	Number of Schools
Exited bottom 5 percent	31
Exited bottom 5 percent but declined again	2
In bottom 5 percent for all three years	7

Using Baseline Performance as a Ruler

When identifying chronically low-performing schools, we looked for schools whose performance in the last three years of the time period analyzed fell consistently below that of the fifth-percentile school—not in each of those years but in the baseline.

We used baseline performance as our “ruler” for several reasons. First, as proficiency rates in a state improve, the passing rate that schools need to reach to emerge from the bottom 5 percent tends to rise. Setting the bottom 5 percent bar based on a single time period allowed us to compare each school to a consistent target, rather than a moving one. Using baseline data ensured that we identified schools that were lagging so far behind that they required state or district attention, even though they may have been making some gains.

Figure 9: Overlap Between Maryland Schools That Are Stuck and Chronically Low Performing in Reading

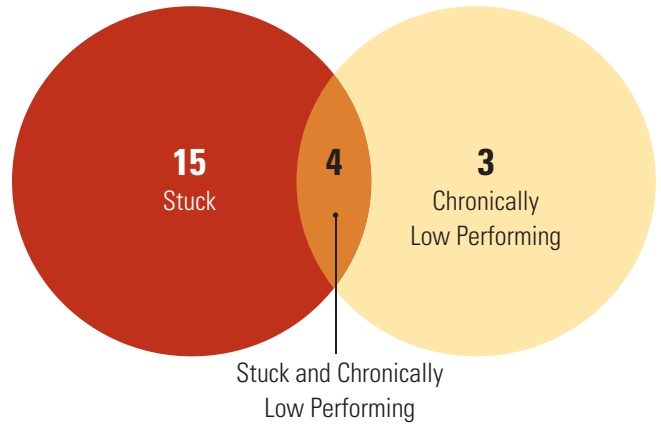
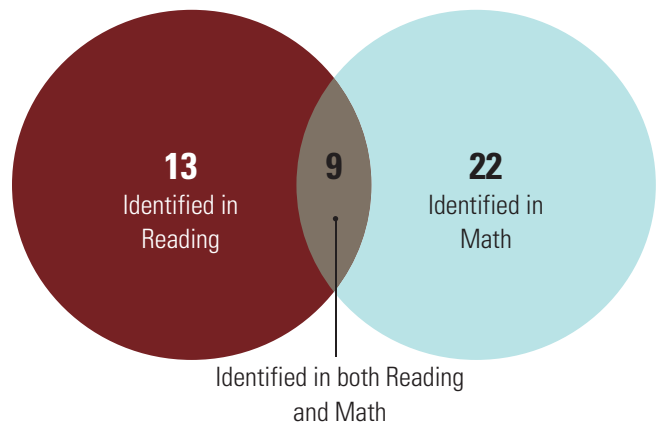


Figure 10: Overlap Between Maryland Schools Identified as Chronically Low Performing or Stuck in Reading and Math



fact, four of the seven chronically low-performing schools are among the lowest improving in the state and are captured in the stuck-schools analysis. The remaining three schools are making higher, though insufficient, gains. In total, 22 elementary and middle schools in Maryland are stuck, chronically low performing, or both.

In addition, 2005-09 MSA results indicate that 31 schools are stuck or chronically low performing in math (see Appendix II). In total, 44 schools, or about 4 percent of the elementary and middle schools we studied, are stuck or chronically low performing in math, reading, or both. Nine are stuck or chronically low performing in both math and reading, 13 in reading only, and 22 in math only (see Figure 10).

Although overall test results tell only part of the story, looking at the data in a variety of ways—finding schools that are both stuck and chronically low performing or that are identified as such in both subjects—can help focus state and local attention even more acutely. Who would argue that students in a school that’s consistently in the bottom 5 percent of performance and improving slower than three-quarters of schools in the state in both reading and math don’t deserve something better?

Trends in Maryland’s Data. Maryland’s data display some encouraging trends in school performance. On average, reading and math proficiency rates are improving from year to year, and schools that started out low performing generally are making bigger gains than those that started out as high performing.

Among schools that started as low performing, however, a small number are not improving or are improving far too slowly. What’s more, our analysis suggests that certain districts are less effective than others in advancing their low-performing schools. The issue of district capacity has received insufficient attention in conversations about school improvement. (The third paper in this series will explore district patterns in more detail.)

INDIANA: STAGNATING STATEWIDE

The Indiana analysis included 2004-08 assessment results for 1,477 schools. As in Maryland, alternative and special education schools were excluded from the dataset. For schools serving some combination of grades 3-8 that also served one or more high school grades, we used test results for third to eighth grade only.

Baseline Reading Performance. On average, in 2004-06 (the baseline) 72 percent of Indiana’s third-grade to eighth-grade students passed the reading portion of the Indiana Statewide Testing for Educational Progress–Plus (ISTEP+). The average proficiency rate at high-performing schools was 85 percent; at low-performing schools the proficiency rate averaged about 57 percent (see Figure 11).

2004-08 Improvement. Unlike in Maryland, the average rate of reading proficiency in Indiana remained virtually flat from 2004 to 2008. On average, schools in the top quartile of improvement gained only 2.2 percentage points per year, while schools in the bottom quartile of improvement lost 1.9 percentage points annually. This means that proficiency rates among low “improvers” declined by nearly eight percentage points over this period (see Figure 12).

Figure 11: Baseline (2004-06) Reading Proficiency Rates of Indiana’s High-Performing, Average, and Low-Performing Schools

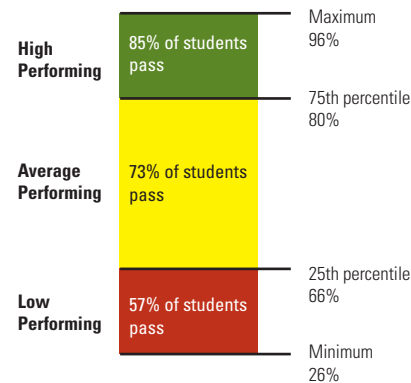


Figure 12: 2004-08 Improvement Rates at Indiana’s High-Improving, Average, and Low-Improving Schools: Reading

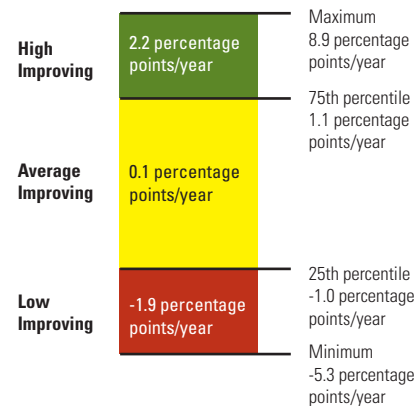


Figure 13: Demographics of Indiana’s High-Performing, Average, and Low-Performing Schools: Reading

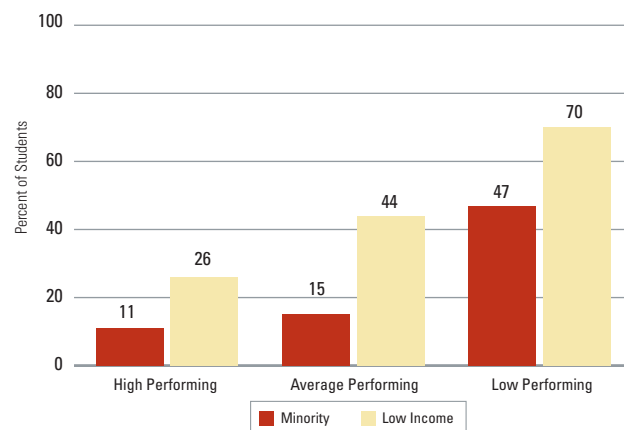
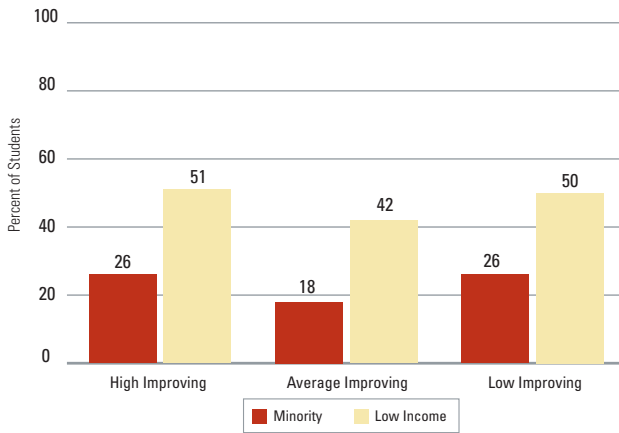


Figure 14: Demographics of Indiana's High-Improving, Average, and Low-Improving Schools: Reading



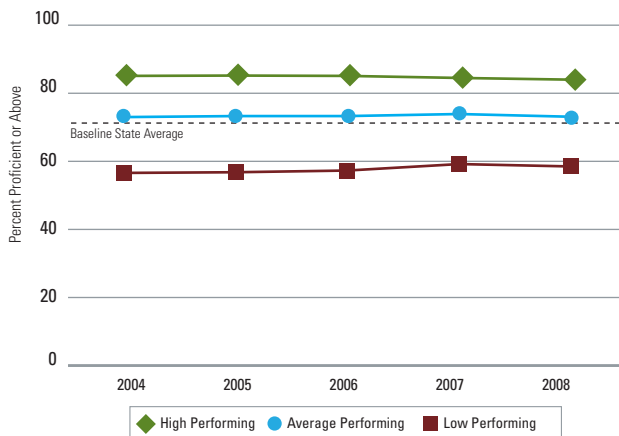
Demographics of Schools Differing in Performance and Improvement.

Looking at the demographics of high-performing, average, and low-performing schools, we again see that schools in the bottom quartile have the highest percentages of low-income and minority students (see Figure 13). Unlike in Maryland, however, Indiana's high-improving, average, and low-improving schools have similar demographics (see Figure 14). In other words, the data indicate that Indiana schools that serve high percentages of low-income and minority students are more likely than other schools to be low performing, but they are no more likely to be making high gains.

Where Schools at Different Performance Levels Started and Ended Up.

Figure 15 shows the 2004-08 proficiency rates of schools that started out high performing, average, and low performing. On average, reading proficiency

Figure 15: 2004-08 Reading Performance of Indiana's High-Performing, Average, and Low-Performing Schools



rates at schools that started out high performing declined slightly. Average-performing schools stagnated, neither losing ground nor improving over this period. Schools that started out low performing did make small gains, but with average improvement rates of just over half a percentage point per year, there is little evidence that these schools are catching up with their higher performing counterparts.

What's more, a closer look at trends in proficiency rates of initially low-performing schools shows that while about 38 percent of these (141 schools) become among the highest improving in the state, nearly a quarter (88 schools) are lowest improving (see Figure 16).

In fact, because reading performance at the 25th percentile school is actually declining by a percentage point per year, we know that some of the average-improving low performers are also losing ground. Because any low-performing school that is declining is, by definition, stuck, the number of stuck schools in Indiana actually is greater than the 88 schools in Figure 16. Indeed, 141 schools started out low performing and proceeded to lose ground—just under 40 percent of the state's low performers (see Figure 17 on page 9).

Figure 18 shows the 2004-08 performance of these 141 stuck schools and other initial low performers. Although, on average, proficiency rates at high-improving schools increased by about ten percentage points over this period, stuck schools declined by five percentage points. And in some schools, declines have been far more dramatic: At an elementary school in Richmond that serves more than 350 students, for example, the percentage of those who scored proficient or above in reading fell from 64 percent in 2004 to only 50 percent in 2008.

Figure 16: Number of Low-Performing Schools in Indiana That Are High Improving, Average, and Low Improving: Reading

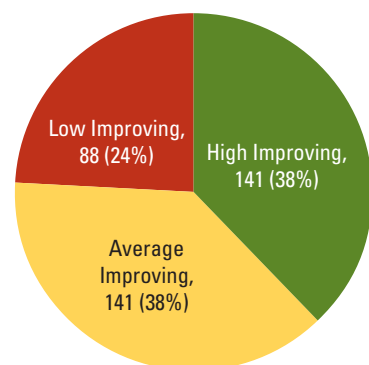
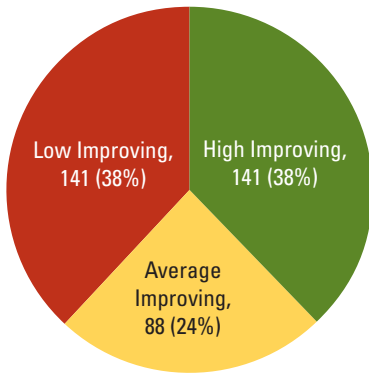


Figure 17: Number of Low-Performing Schools in Indiana That Are High Performing, Average, and Low Improving: Reading (Low-Improving schools include all schools with declining performance)



Identifying Chronically Low-Performing Schools. Because so many schools in Indiana have lost ground from 2004 to 2008, low-performing schools that are not declining will not show up in our data as stuck schools, even if they are making only minimal gains. Examples of such “non-stuck” low-performers include a middle school where 37 percent of students were proficient in reading in 2004 and 40 percent reached this target by 2008. Another example is an elementary school where reading proficiency rates “improved” from 40 percent to 41 percent. Considering that in our baseline (2004-06), the fifth-percentile school (the school whose proficiency rates were lower than those of 95 percent of schools in Indiana) had a reading-proficiency rate of 50 percent, results at both of these schools are utterly dismal.

All of this is to say that in Indiana, as well as in any state where all low-improving schools are losing ground, it is particularly important to identify schools where performance remains chronically low.

To identify chronically low-performing schools in Indiana, we used the same approach as in Maryland. Comparing 2006, 2007, and 2008 reading-proficiency rates of each school with the performance of the fifth-percentile school in the baseline reveals that 31 schools consistently scored below this benchmark. Seventeen of these schools are also stuck (they lost ground from 2004 to 2008); the remaining 14 (including the two aforementioned schools) are making small but insufficient gains—in some cases less than one percentage point each year (see Figure 19).

Figure 18: 2004-08 Reading Proficiency Rates of Indiana’s Low-Performing Schools Showing High, Average, and Low Improvement

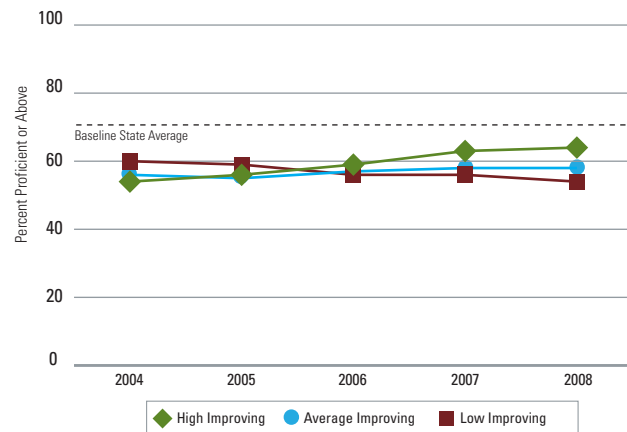


Figure 19: Indiana’s Chronically Low-Performing Schools: Reading

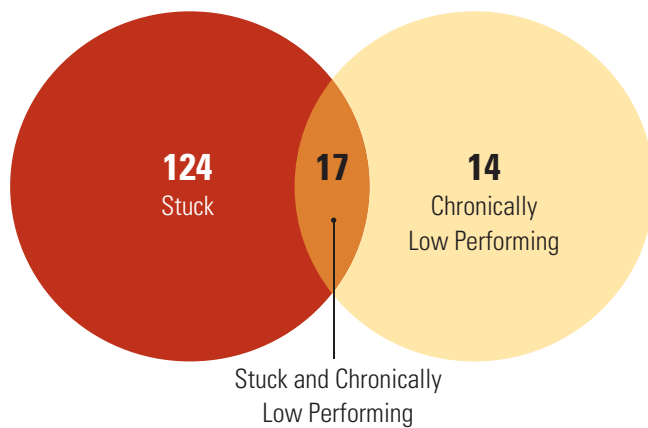
	Number of Schools
Exited bottom 5 percent	31
Exited bottom 5 percent but declined again	11
In bottom 5 percent for all three years	31

Tallying Stuck and Chronically Low-Performing Schools.

Based on 2004-08 ISTEP+ reading scores, 155 elementary and middle schools in Indiana are stuck, chronically low performing, or both (see Figure 20 on page 10). ISTEP+ math results, which reveal 147 stuck or chronically low-performing schools, appear in Appendix II. A closer look at these schools shows that 74 are stuck or chronically low performing in both reading and math, 81 in reading only, and 73 in math only. In total, 228 schools (about 15 percent of elementary and middle schools in Indiana) started out low performing in reading, math, or both and have proceeded to decline or make minimal gains over the subsequent five years (see Figure 21).

Trends in Indiana’s Data. On average, reading and math proficiency rates in Indiana’s elementary and middle schools have remained nearly flat from 2004 to 2008 at high-performing, average, and low-performing schools. More than one-third of schools that started out in the bottom quartile of performance in the baseline in each subject proceeded to lose ground over this time. A few more

Figure 20: Overlap Between Indiana Schools That Are Stuck and Chronically Low Performing in Reading



low-performers managed not to decline but continued to consistently perform below 95 percent of the schools in the state—a clearly unacceptable level.

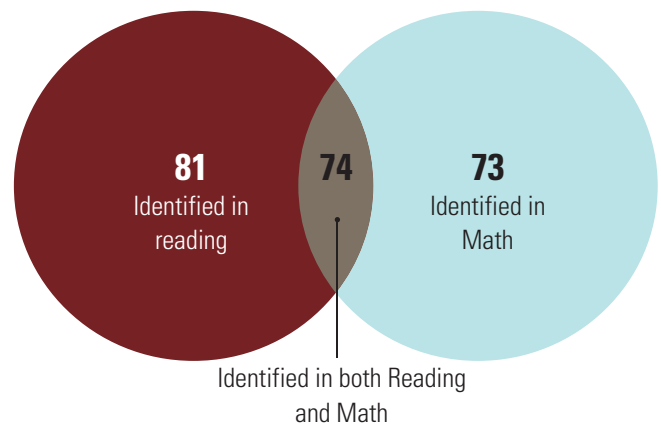
Yet even in Indiana, where the overall picture is quite dim, some schools demonstrate that improvement is possible. At an elementary school in Seymour, for example, reading-proficiency rates rose from 48 percent in 2004 to 72 percent in 2008. And at an elementary school in Gary, 35 percent of students passed the math ISTEP+ in 2004, but 61 percent passed in 2008. Indiana could benefit from finding these schools, understanding what they are doing to raise proficiency rates, and taking meaningful improvement strategies to scale.

CONCLUSION AND IMPLICATIONS

So what do these data tell us about recent patterns in school improvement? Tracking math and reading-assessment results over time, we see that some schools that started out low-performing are making substantial progress. Their gains aren't always consistent from year to year, but proficiency rates at these schools are clearly and substantially improving. Most of these schools still aren't performing as well as they should, but students and educators would benefit if state and district leaders figured out what these schools are doing right and scaled up practices that are likely to lead to meaningful gains in learning.

Each of the ten states we looked at, however, also has another group of schools—ones that started out low performing and have made little to no improvement or even lost ground. What's more, some schools persistently produced worse results than 95 percent of schools in their states, even as they managed to make some gains. In an

Figure 21: Overlap Between Indiana Schools Identified as Stuck or Chronically Low Performing in Reading and Math



environment where funds and capacity are limited at best, educators and policymakers will need to establish clear priorities. Together with AYP data and other indicators, this analysis can help states focus resources where they are most needed—on ensuring that students currently stranded in low-performing schools that can't or won't improve on their own get the support they need to catch up to their peers.

Finally, as data from Maryland and Indiana demonstrate, performance and improvement patterns can differ dramatically from state to state: Maryland shows a pattern of overall gains; Indiana, general stagnation. We selected these states precisely because they present such different trends—ones we have observed in other states. Again, Maryland and Indiana are merely examples, and our intention is not to show that one is doing better than the other. Rather, it is to highlight these trends and, in the process, offer ways to help educators and policymakers explore data in their own states.

Of course, overall test scores can only tell us so much. The next paper in this series will examine the performance of student subgroups. And following that, we will take a closer look at where stuck schools operate to see whether improvement patterns differ from district to district.

Likewise, it's important to consider these data within the broader policy context. Many educators and policymakers agree that the next generation of accountability systems must measure absolute performance and progress alike. The diverging trends we found among schools that start out low performing support this notion. These schools are not all the same: An accountability system

should distinguish between schools that start out low performing and make gains and those that year after year show little capacity to improve.

That said, the comparative nature of this analysis limits its use in developing a new accountability system. If anything, the drastically different improvement patterns in Maryland and Indiana offer a cautionary tale to those who insist that performance targets should be based solely on comparative data. When, as in Indiana, it takes gains of one percentage point per year to be considered a top improver, pegging expectations to the current rate of progress isn't nearly enough.

Lessons from this analysis can help inform the accountability conversation, and the final paper in this series will explore these in greater depth. While there is much more to learn about patterns in school improvement, we hope the approach outlined here offers states and districts another way of looking at their own data to find schools whose students need help not tomorrow, not in a year or two, but now.

An accountability system should distinguish between schools that start out low performing and make gains and those that year after year show little capacity to improve.

NOTES

(Some links may have expired. Some links that appear on multiple lines may not be reachable directly from this document. It may be necessary to copy and paste the entire link into your browser.)

- ¹ Until the 2008-09 school year, Indiana administered the Indiana Statewide Testing for Educational Progress-Plus (ISTEP+) assessments for grades 3-8 in the fall of each school year. In 2008-09, the assessment was administered twice—once in the fall and again in the spring. Although the fall 2008 results are comparable with those of prior years, the spring 2009 assessment has changed substantially and no longer is comparable. Our analysis includes assessment results from the fall 2004 to fall 2008 assessments. We refer to these data as 2004-08 to be consistent with the state and to reflect the fact that fall assessments measure learning from the prior academic year, rather than the current year.
- ² We calculated baseline proficiency rates by averaging the first three years of each school's test results (2004-06 in Indiana and 2005-07 in Maryland). To calculate average annual improvement, we used the formula for the slope of the best fit-line running through each school's proficiency rates over the five years analyzed.
- ³ "Mapping State Proficiency Standards onto NAEP Scales: 2005-2007" National Center for Education Statistics, 2009.
- ⁴ Two things to note about the Maryland data used in this analysis. In 2008, Maryland eliminated a number of norm-referenced test items that had not counted toward a student's score on the Maryland State Assessments in reading and math. It also replaced several additional items that had counted with field-tested questions

developed by the state. Following a review of the 2008 test, Maryland's Psychometric Advisory Council concluded that the slightly shorter 2008 assessments in both subjects were comparable in difficulty with prior administrations of the MSA. But it acknowledged the possibility that the "reduced testing burden on the students" may have contributed to the observed gains in test scores that year (National Psychometric Council. August 1, 2008. Memorandum to the Maryland State Board of Education Re: 2008 MSA Linking. Available at www.msde.maryland.gov/NR/rdonlyres/3253C1DD-CA2E-4E64-A066-D6F36EBADF9B/17997/2008MSAresultsbrief%20ngpaperAug08F.pdf. Maryland, along with organizations such as the Center on Education Policy, compares 2008 results with those of prior years. However, because of the changes mentioned above, we urge readers to use caution when interpreting the data presented in this section. Furthermore, note that this analysis relies on proficiency-rate data used to make AYP determinations in the state. Changes to how these proficiency rates are calculated may affect improvement-rate estimates.

- ⁵ While alternative and special education schools may require state or district intervention, it may not be appropriate to compare them with regular schools. We have chosen to exclude them from this analysis and will discuss this decision in more detail in a subsequent paper.

Appendix I

“Stuck Schools” presents a comparative analysis of performance data and improvement trajectories of elementary and middle schools in a state. The analysis is based on school-level state-assessment data for five consecutive years (2004-08 in Indiana and 2005-09 in Maryland). Aggregate schoolwide proficiency rates in reading and math are used to (1) rank and assign schools to a baseline performance category and (2) assess change in performance over time. Content standards, performance standards, and assessments must be comparable across the time period to conduct the analysis.

Schools are identified as being stuck in reading, math, or both based on low baseline performance and low improvement over time. In addition, chronically low performing schools are also identified and cross-referenced with “stuck schools” to determine the overlap between schools in each of these categories.

In “Stuck Schools,” publicly available data in reading and mathematics from Maryland and Indiana are used to

walk readers through the analytical framework. Each state provides the data for core variables in slightly different ways.

SCOPE OF THE ANALYSIS

I. Variables and Data Sources

The variables needed to conduct the analysis are:

- School characteristics
 - Percentage minority students (African American, Latino, or Native American)
 - Percentage low-income students (eligible for free or reduced-price lunch)
- Aggregate schoolwide proficiency rate (percentage of all students in grades 3-8 scoring proficient or above on the state assessment) in reading and math, respectively, for five consecutive years (2005-09 in Maryland and 2004-08 in Indiana)

Table A-1 lists and describes the data sources used in the Maryland analysis. Table A-2 lists and describes the

Table A-1: Maryland Data Sources*

Data Sought	Data Source	Data Available	Data Source URL
2005-09 Proficiency Rates	2005-09 Adequate Yearly Progress (AYP) files	Total number and percentage of students scoring proficient or above in reading and math, by subgroup, in each Maryland public school.	http://mdreportcard.org/downloadindex.aspx (2009) and http://mdreportcard.org/downloadindexprevious.aspx?k=99AAAA (2005-2008)
Percentage Low-Income and Percentage Minority	2009 Adequate Yearly Progress (AYP) file	Total number of students tested and testing participation rate, by subgroup and by school, for each Maryland public school.	http://mdreportcard.org/downloadindex.aspx
Alternative/ Special Education School Identifier	2009 Students Receiving Special Services file	Percentage of students receiving special education services in each Maryland public school.	http://mdreportcard.org/downloadindex.aspx
High School Grades Identifier	2009 Enrollment Data file	Total enrollment by grade (but not by subgroup) in each Maryland public school.	http://mdreportcard.org/downloadindex.aspx

* 2005-2008 Adequate Yearly Progress files were downloaded in July 2009. All other data files were downloaded in October 2009.

Table A-2: Indiana Data Sources*

Data Sought	Data Source	Data Available	Data Source URL
2004-08 Proficiency Rates	2004-08 Public School Disaggregated Files for Grades 3-8	Total number of students tested and number of students scoring proficient or above in English/Language Arts (reading) and math, by subgroup and by grade in each Indiana public school.	www.doe.in.gov/istep/2008/welcome.html www.doe.in.gov/istep/2007/welcome.html www.doe.in.gov/istep/2006/welcome.html www.doe.in.gov/istep/2005/welcome.html
Percentage Low-Income	2008-09 Free Lunch Counts by School	Number of students qualifying for free lunch and reduced-price lunch, by school, for each Indiana public school.	http://mustang.doe.state.in.us/SAS/sas2.cfm?type=s&tab=sl&already=
Percentage Minority	2008-09 Enrollment by Grade	Total number of students and number of students by race enrolled in each Indiana public school.	http://mustang.doe.state.in.us/SAS/sas2.cfm?type=s&tab=peschl&already=
Alternative/Special Education School Identifier	General School Variables	Contains a School Type variable that identifies alternative (Stype=9), special education (Stype=7), and other specialized types of schools (e.g. adult education programs)	http://mustang.doe.state.in.us/SAS/sas2.cfm?type=s&tab=schls&already=

*2004-08 Public School Disaggregated Files for Grades 3-8 and the General School Variables file downloaded in July 2009. 2008-09 Free Lunch Counts and Enrollment by Grade downloaded in October 2009.

data sources used in the Indiana analysis.

The various available data sets in each of the states were merged together to perform the analysis. Prior to ranking schools on performance and improvement, schools that did not meet the analysis criteria were eliminated from the dataset. The following types of schools were excluded from the analysis:

1. Schools missing proficiency-rate data for one or more years.
2. Schools missing key directory information.
 - a. Maryland: schools missing grade-by-grade enrollment data
 - b. Indiana: schools missing school-type data
3. Alternative schools and special education schools
 - a. Maryland: Schools serving more than 50 percent of students receiving special education services were excluded, as were education centers, hospital facilities, and schools that included "alternative"

in their school name.

- b. Indiana: A school type variable was provided by the state that classified schools as special education (Stype=7) or alternative (Stype=9).
4. Schools or data that included high school assessment results
 - a. Maryland: Because Maryland's AYP files did not provide grade-by-grade proficiency rates, schools with enrollment in grade 9 or higher were excluded.
 - b. Indiana: High school-level test results were excluded from the analysis. Schools that served some combination of grades 3-8 and high school grades remained in the analysis.

See Tables A-3 and A-4 for counts of schools that were included in the analysis or eliminated based on the above criteria in Maryland and Indiana, respectively.

Table A-3: Number of schools included in and eliminated from the analysis, by school type: Maryland

School Type		Reading Analysis	Math Analysis
Total number of schools with any assessment data for 2005-09		1,458	1,458
Total number of schools with five years of data		1,281	1,283
Eliminated from analysis	<i>Schools missing grade-by-grade enrollment data</i>	0	0
	<i>Alternative/special education Schools</i>	23	23
	<i>High Schools (no elementary/middle school grades)</i>	184	186
	<i>Elementary/middle schools with high school grades</i>	8	8
Total schools included in analysis		1,066	1,066

Table A-4: Number of schools included in and eliminated from the analysis, by school type: Indiana

School Type		Reading Analysis	Math Analysis
Total number of schools with any assessment data for 2004-08		1,669	1,669
Total number of schools with five years of data		1,488	1,488
Eliminated from analysis	<i>Schools missing school-type data</i>	5	5
	<i>Alternative/special education schools</i>	6	6
Total schools included in analysis		1,477	1,477

In addition, the percentage of low-income and minority students was calculated for each school. Minority students are defined as students who are African American, Latino, or Native American. Low-income students are defined as those eligible for free or reduced-price lunch. For Indiana, the demographic characteristics of each school were calculated based on enrollment data and free or reduced-price lunch count data. For Maryland, these characteristics were estimated for each school based on the number of students tested and the participation rate, as follows:

- Percent Minority= $\left[\frac{\text{Number of African American Students Tested}}{\left(\text{Participation Rate}_{\text{African American}}/100\right)} + \frac{\text{Number of Latino Students Tested}}{\left(\text{Participation Rate}_{\text{Latino}}/100\right)} + \frac{\text{Number of Native American Students Tested}}{\left(\text{Participation Rate}_{\text{Native American}}/100\right)}\right] / \left[\frac{\text{Total Students Tested}}{\left(\text{Participation Rate}_{\text{All students}}/100\right)}\right]$
- Percent Low-Income= $\left[\frac{\text{Number of students eligible for free or reduced-price lunch tested}}{\left(\text{Participation Rate}_{\text{Free/reduced lunch-eligible}}/100\right)}\right] / \left[\frac{\text{Total Students Tested}}{\left(\text{Participation Rate}_{\text{All students}}/100\right)}\right]$

Where the participation rate was not reported, we assumed a participation rate of 100 percent.

II. ANALYSIS OF PERFORMANCE AND IMPROVEMENT OVER TIME

The following steps and calculations were used to look at school performance over time and to identify stuck and/or chronically low-performing schools in each state. Steps 1-9 were performed separately for reading and math assessment results.

A. Calculating Baseline Performance and Improvement Rates

1. Calculate the aggregate schoolwide proficiency rate for each school:

Aggregate school proficiency rate_{(Subject A)(Year N)} = $\left[\frac{\text{Sum of all students in grades 3-8 that scored proficient or above}_{(\text{Subject A})(\text{Year N})}}{\text{Total number of students tested in grades 3-8}_{(\text{Subject A})(\text{Year N})}}\right]$

2. Calculate a *baseline performance* for each school by averaging that school's proficiency rates across the first three years of the analysis time period (2004-06 for Indiana and 2005-07 for Maryland)

- Calculate each school's *improvement rate* (over 2004-08 for Indiana and 2005-09 for Maryland) using the following formula for the slope of the best-fit line:

$$\text{Improvement rate} = \frac{n(\sum xy) - (\sum x)(\sum y)}{n(\sum x^2) - (\sum x)^2}$$

Where

x= School year (2004-08 for Indiana; 2005-09 for Maryland)

y= proficiency rate

And where

$\sum xy$ = sum of products = $x_1y_1 + x_2y_2 + \dots + x_ny_n$

$\sum x$ = sum of x-values = $x_1 + x_2 + \dots + x_n$

$\sum y$ = sum of y-values = $y_1 + y_2 + \dots + y_n$

$\sum x^2$ = sum of squares of x-values = $x_1^2 + x_2^2 + \dots + x_n^2$

B. Categorizing Schools Based on Performance and Improvement; Identifying Stuck Schools

- Rank schools by baseline performance and divide into quartiles. Classify schools whose baseline performance was in the top 25 percent of all the state's schools as "High Performing," those in the middle 50 percent as "Average Performing," and those in the bottom 25 percent as "Low Performing."
- Rank schools by improvement rate and divide into quartiles. Classify schools whose improvement rate was in the top 25 percent of all the state's schools as "High Improving," those in the middle 50 percent as "Average Improving," and those in the bottom 25 percent as "Low Improving." All schools that lost ground during the time period analyzed were considered low improving.
- Calculate descriptive statistics, including percentage minority, percentage low-income, and average performance by year for schools at each level of performance and improvement.
- Identify which of the low-performing schools are high, average, or low improving. Schools that are low performing and low improving are classified as "stuck."
- Calculate average proficiency rates by year for low-performing schools showing high, average, and low improvement.

C. Identifying Chronically Low-Performing Schools

- Identify schools whose performance in each of the last three years analyzed (2006, 2007, and 2008 for Indiana and 2007, 2008, and 2009 for Maryland) was below the proficiency rate of the fifth-percentile school in the baseline. Schools whose performance was below this benchmark in all three years are classified as chronically low performing.

D. Determine Overlap Between Stuck and Chronically Low-Performing Schools

- Cross-reference list of schools identified as stuck and those identified as chronically low performing in each subject to (a) distinguish between schools that are both stuck and chronically low performing and those that fall into only one of these categories, and (b) to calculate the total number of schools identified in a particular subject.
- Cross-reference list of schools identified as stuck or chronically low performing in reading and math to (a) distinguish between schools that are struggling in both subjects and those struggling in only one, and (b) calculate the total number of schools in the state identified as stuck or chronically low performing in at least one subject area.

Appendix II

This appendix presents the results of our analysis of math performance over time at elementary and middle schools in Maryland and Indiana, respectively. Figures B-1 through B-9 parallel Figures 1-9 for reading in the main report, while Figures B-10 through B-19 parallel Figures 11-20.

I. MARYLAND MATH RESULTS

Figure B-1: Baseline (2005-07) Math Proficiency Rates of Maryland's High-Performing, Average, and Low-Performing Schools

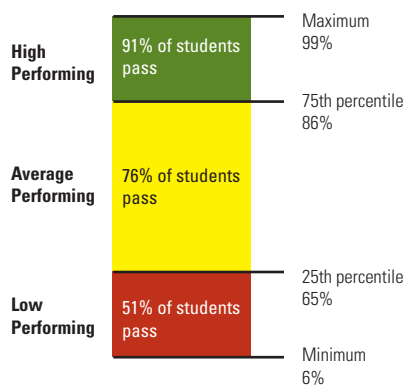


Figure B-3: Demographics of Maryland's High-Performing, Average, and Low-Performing Schools: Math

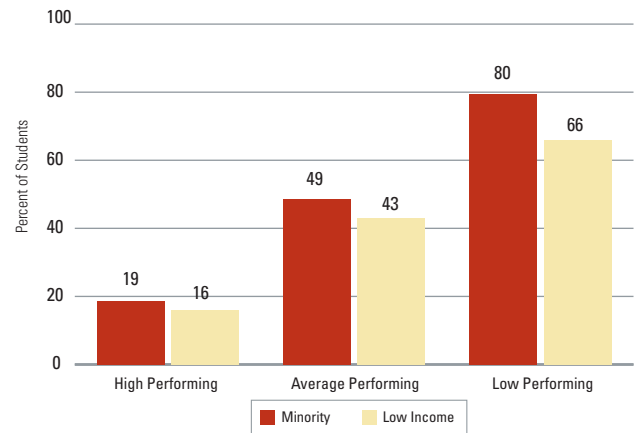


Figure B-2: 2005-09 Improvement Rates at Maryland's High-Improving, Average, and Low-Improving Schools: Math

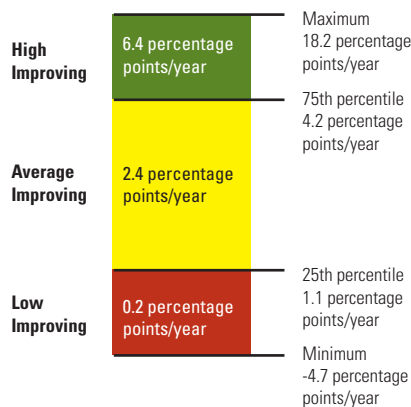


Figure B-4: Demographics of Maryland's High-Improving, Average, and Low-Improving Schools: Math

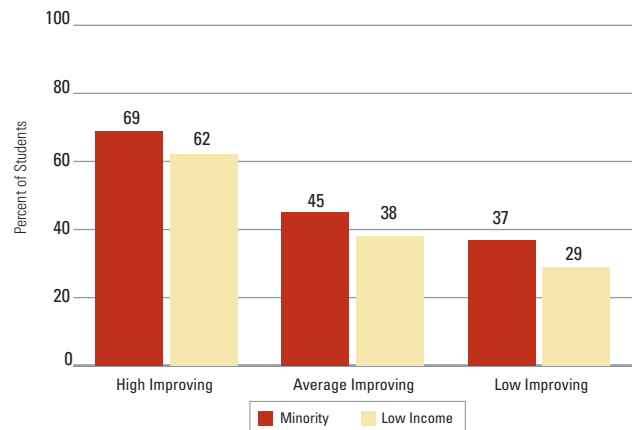


Figure B-5: 2005-09 Math Performance of Maryland's High-Performing, Average, and Low-Performing Schools

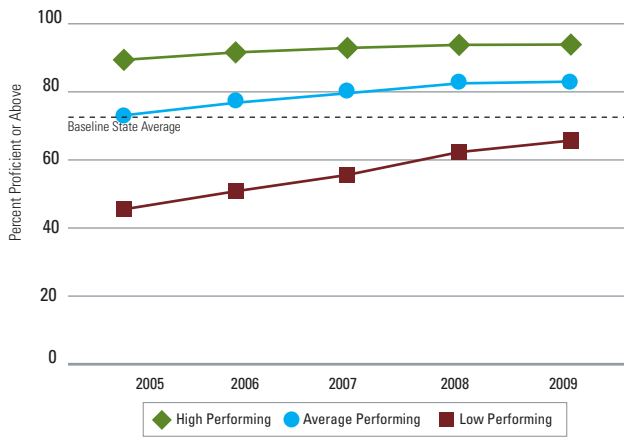


Figure B-8: Maryland's Chronically Low-Performing Schools: Math

	Number of Schools
Exited bottom 5 percent	24
Exited bottom 5 percent but declined again	1
In bottom 5 percent for all three years	17

Figure B-6: Number of Low-Performing Schools That Are High-, Average, and Low Improving: Math

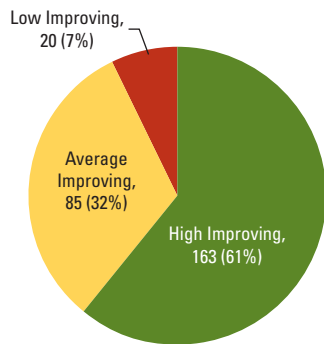


Figure B-9: Overlap Between Schools That Are Stuck and Chronically Low Performing in Math in Maryland

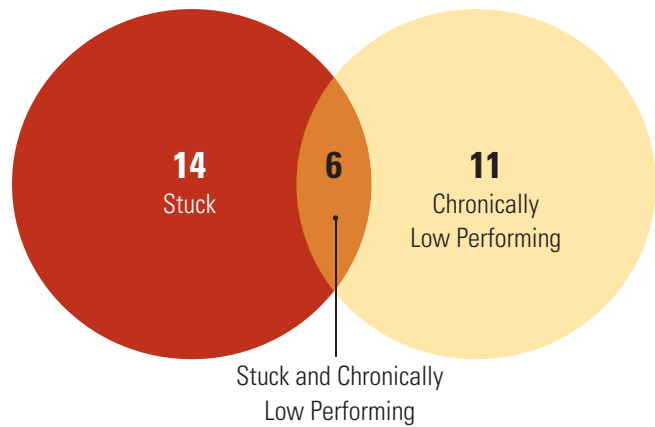
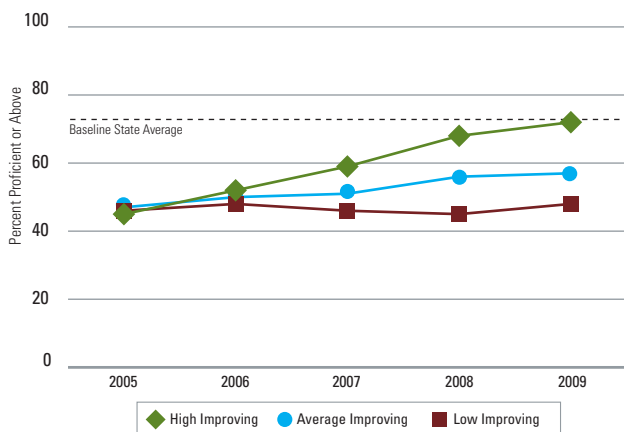


Figure B-7: 2005-09 Math Proficiency Rates of Maryland's Low-Performing Schools Showing High, Average, and Low Improvement



II. INDIANA MATH RESULTS

Figure B-10: Baseline (2004-06) Math Proficiency Rates of Indiana's High-Performing, Average, and Low-Performing Schools

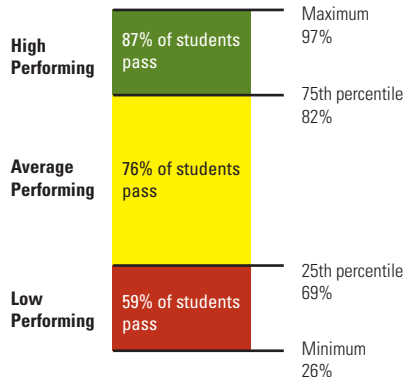


Figure B-12: Demographics of Indiana's High-Performing, Average, and Low-Performing Schools: Math

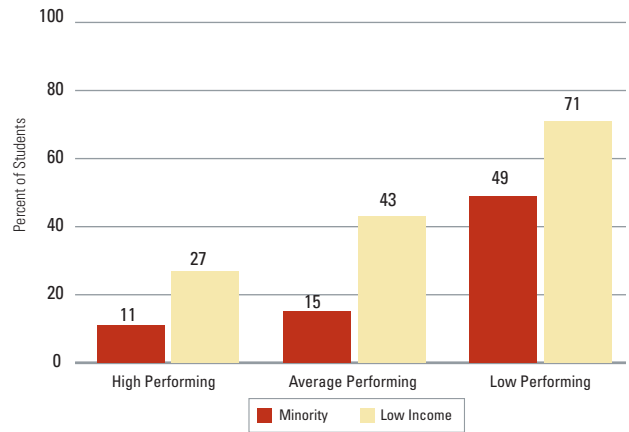


Figure B-11: 2004-08 Improvement Rates at Indiana's High-Improving, Average, and Low-Improving Schools: Math

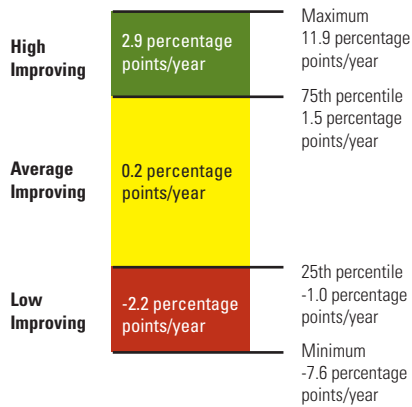


Figure B-13: Demographics of Indiana's High-Improving, Average, and Low-Improving Schools: Math

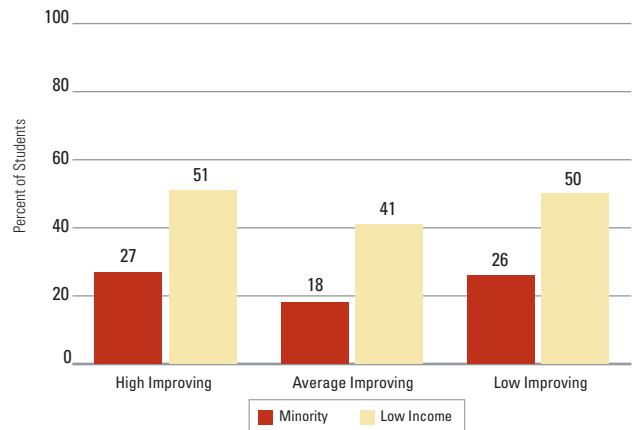


Figure B-14: 2005-09 Math Performance of Indiana's High-Performing, Average, and Low-Performing Schools

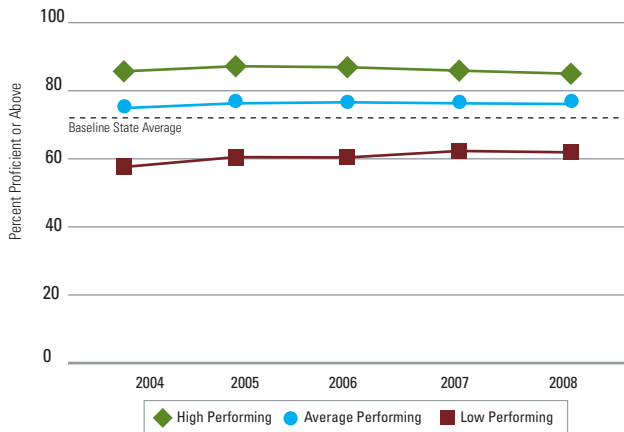


Figure B-17: 2005-09 Math Proficiency Rates of Indiana's Low-Performing Schools Showing High, Average, and Low Improvement

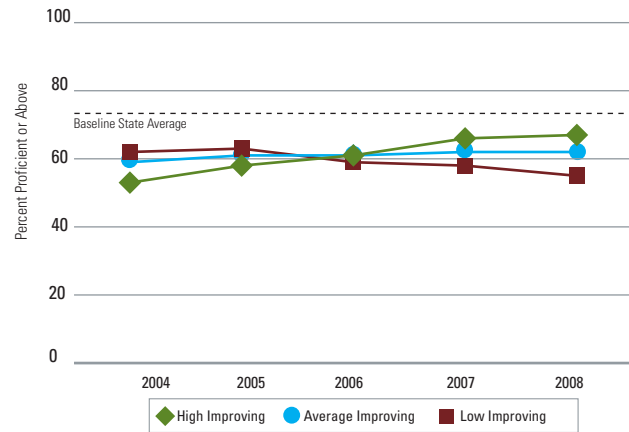


Figure B-15: Number of Low-Performing Schools in Indiana That Are High-Improving, Average, and Low Improving: Math
(Low-Improving schools include only schools in the bottom quartile of improvement)

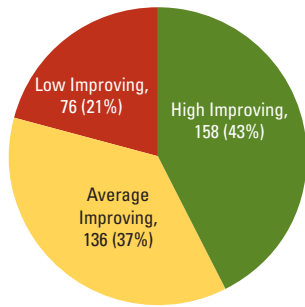


Figure B-18: Indiana's Chronically Low-Performing Schools: Math

	Number of Schools
Exited bottom 5 percent	34
Exited bottom 5 percent, but declined again	6
In bottom 5 percent for all three years	32

Figure B-16: Number of Low-Performing Schools in Indiana That Are High Improving, Average, and Low Improving: Math
(Low-Improving schools include all schools with declining performance)

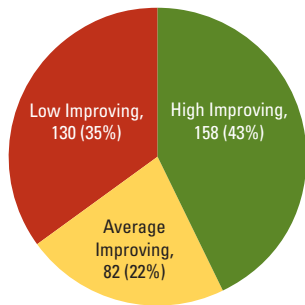
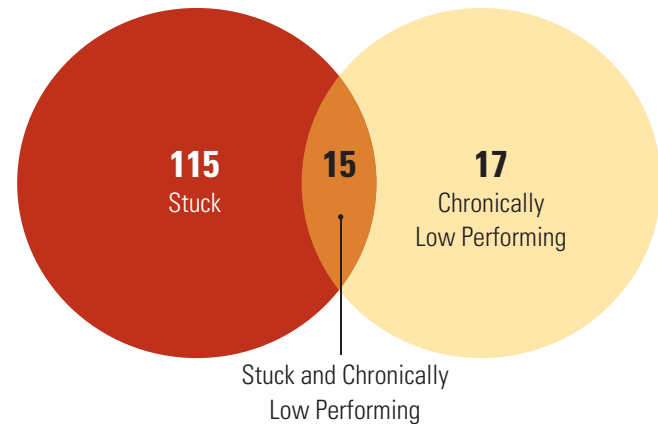


Figure B-19: Overlap between Indiana Schools that are Stuck and Chronically Low Performing in Math



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