



**Keeping On Track in Ninth Grade and Beyond:
Baltimore's Ninth Graders in 2007-08**

A Research Report by the Baltimore Education Research Consortium

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Executive Summary**

Raising the graduation rate in Baltimore City will require specific attention to addressing the behavioral factors identified in previous research that push students off-track to graduation, particularly chronic absenteeism, suspensions, and course failure in ninth grade.¹ Researchers further hypothesize that interventions to reduce the incidence of these behaviors associated with non-graduation will help to increase graduation rates, though such intervention studies have not yet been underway long enough for graduation outcomes to be measured. Such interventions will often need to address underlying causes of behavioral indicators. A first step, prior to organizing intervention strategies and evaluating their effectiveness, is to describe the extent and concentration of these ninth grade early warning indicators, which is the primary goal of this study.

Analysis of Baltimore City Schools data for the 6,662 first-time ninth graders in 2007-08 indicated that:

Chronic absenteeism was widespread.

- Four in ten (41.9%) of all first-time ninth graders missed more than 20 days of school in 2007-08.
- While the majority (62.4%) of those chronically absent in ninth grade were also chronically absent in eighth grade the prior year, more than a third of the chronically absent first-time ninth graders were newly falling off-track in attendance as they entered high school.

Core course failure was even more common than chronic absenteeism.

- Half (50.4%) of all first-time ninth graders with transcript data failed at least one core course (math, English, social studies or science) and nearly four in ten (37.6%) failed two or more core courses. Course failure means that credits required for graduation were not earned, and have to be recovered in some way to keep students on track to graduation.
- While course failure was strongly related to attendance (correlation of -0.6), a relatively large minority (40.4%) of students with at least one failure were not chronically absent (had 20 or fewer absences), and one in five had attendance of at least 95 percent.
- Though course failure in ninth grade was related to failing math or reading/language arts (RELA) in eighth grade (the prior year), there were numerous ninth graders whose course failure would not have been predictable. Just one in four of those failing in ninth grade had evidence of failing math or RELA the prior year.

Suspensions were much less prevalent.

- About one in six (16.9%) of first-time ninth graders in 2007-08 had at least one suspension, of whom most (80.9%) had suspensions of at least three days (a total of 13.7% of the cohort).
- The majority (72.9%) of those who were suspended for at least three days were also chronically absent in 2007-08.
- Suspensions were more extensive among males than females (16.9% vs. 10.4%) and special education than regular students (18.6% vs. 12.7%).

Implications of the Findings

Raising the graduation rate in Baltimore City will particularly require specifically targeted efforts to increase attendance and reduce ninth grade course failure. The large number of students exhibiting these warning signals demands extensive district support to those schools where concentrations are extremely high. Efforts to increase attendance must begin much earlier than high school, since most of those chronically absent in ninth grade had poor attendance patterns already established in prior years.

The district's Master Plan already includes numerous action steps designed to increase attendance. While there is considerable discussion underway of the steps being taken, it is important for the district to consider a more formal analysis of ongoing efforts to increase attendance. Similarly, while the Master Plan also notes the need to address course failure, it is crucial to collect systematic data on what schools are actually doing to prevent course failure as well as to provide credit recovery options for students who need them. This is particularly important given the significant additional costs associated with credit recovery (for nearly 27,000 core courses failed at Baltimore City high schools grades 9-12 in a single academic year). While some course failure is directly linked to students' irregular attendance, other course failure seems to have different roots.

BERC is currently planning a study to analyze school and classroom practices associated with higher levels of ninth grade course passing in Baltimore's schools. An additional BERC study of the district's efforts to increase attendance would provide useful information for future data-driven decision making. We believe that formal analysis of the current efforts underway to address attendance and course failure in particular will also help district leaders to better integrate multiple programs and strategies into a more systematic framework for dropout prevention. Implementation of early warning systems and public health-style tiered prevention models designed to keep students from falling off-track to graduation (particularly in terms of credits accrued) will be an important step to increase the district's graduation rate. Assessing the effectiveness of current interventions is the next step in the "cycle of inquiry," a fundamental practice of a well-functioning school district "learning community" (Senge, 1990).

Keeping On Track in Ninth Grade and Beyond: Baltimore's Ninth Graders in 2007-08

Introduction

“How do you lose those ninth-grade blues?” asks Barthe DeClements (1993) in the title of her popular young adolescent novel. The ninth grade transition to high school, occurring at the peak of adolescent turmoil, is a crucial year that often determines the probability of a student successfully arriving at on-time graduation. This report explores the experience of the 2007-08 cohort of Baltimore City Schools ninth graders as they begin their journey through high school. Building on research findings in other urban districts, we seek to describe the extent and concentration of ninth grade behaviors that throw students off-track to on-time graduation. In addition, we identify school- and individual-level characteristics that distinguish students with higher and lower levels of risk and resilience indicators. Findings from this study will provide information to help district policymakers target interventions to increase the district's graduation rate.

While graduation rates are considerably higher among some demographic groups than others, Gleason and Dynarski (2002) have shown that demographic factors (e.g., high poverty, Hispanic and Black, having parents or siblings who did not complete high school) do not efficiently predict which students will leave school without graduating. A more promising focus relies on the theoretical construct of student engagement in schooling (e.g., Fredricks, Blumenfeld, & Paris, 2004). Student engagement in schooling has emotional, behavioral, and cognitive components, which are sometimes classified as social and academic engagement (Wehlage, et al., 1989). Behavioral indicators of engagement (e.g., attendance, attention in class, completion of assignments, etc.) are influenced by attitudes -- the emotional and cognitive components of engagement -- which can be viewed within the theoretical context of motivation.

While many of the factors leading to student disengagement are not school-related, the behavioral indicators of student disengagement leading to a dropout outcome, such as attendance and course failure,ⁱⁱ manifest themselves directly at school. Prior research has shown that keeping students on track to graduation consists primarily in assuring that students pass all their ninth grade courses (particularly the core academic courses required for graduation), and continue to pass courses through twelfth grade (Allensworth & Easton, 2007; Mac Iver, Balfanz, & Byrnes, 2009; Neild, 2009; Roderick & Camburn, 1999). But ninth grade course failure is unfortunately still widespread. More than half (53%) of Chicago ninth grade students fail one or more semester courses in ninth grade (Allensworth & Easton, 2007), and figures are similar in other urban districts (Mac Iver, Balfanz, & Byrnes, 2009; Neild & Balfanz, 2006a, 2006b). Once students get off track in ninth grade, bringing them to successful high school graduation is extremely difficult. And ninth grade failure is also related to prior patterns of failure and low attendance. As many as half of high school dropouts in Philadelphia could be identified by patterns of course failure, low attendance, or behavioral problems in sixth grade (Balfanz, Herzog, & Mac Iver, 2007). Longitudinal studies have supported the hypothesis that academic

failure has a direct effect on student motivation, which in turn has a direct effect on dropout behavior (e.g., Kaplan, Peck & Kaplan, 1997).

Raising the graduation rate in Baltimore City will require specific attention to addressing the behavioral factors identified in previous research that push students off-track to graduation, particularly chronic absenteeism, suspensions, and course failure in ninth grade.ⁱⁱⁱ Researchers further hypothesize that interventions to reduce the incidence of these behaviors associated with non-graduation will help to increase graduation rates, though such intervention studies have not yet been underway long enough for graduation outcomes to be measured (e.g., Mac Iver & Mac Iver, 2009). Such interventions will often need to address underlying causes of behavioral indicators (e.g., family issues such as caring for younger siblings that keep students from attending school, health issues, etc.). A first step, prior to organizing intervention strategies and evaluating their effectiveness, is to describe the extent and concentration of these ninth grade early warning indicators, which is the primary goal of this study. In particular, it is crucial to identify the extent and concentration of ninth grade failure, since failure requires district- and school-level planning for credit recovery in order for failing students to graduate. This descriptive study of ninth grade early warning indicators should also motivate a district- and school-level focus on preventing absenteeism, behavior problems, and course failure before they occur.

Research Questions

1. To what extent are City Schools ninth graders exhibiting early warning indicators of non-graduation (chronic absenteeism, behavioral problems, course failure) during ninth grade? How does this vary by demographic group and school type?
2. To what extent did City Schools ninth graders who exhibit early warning indicators of non-graduation also have these indicators prior to ninth grade (in eighth grade, seventh grade, and sixth grade)? How does this vary by demographic group and school type?
3. To what extent did City Schools ninth graders demonstrate resiliency, exhibiting these indicators prior to ninth grade (in eighth grade, seventh grade, or sixth grade) but not in ninth grade? How does this vary by demographic group and school type?

Data and Methods

This analysis used de-identified yearly administrative student-level data files from the Baltimore City Public Schools from 2007-2008 and the four previous years (2003-04, 2004-05, 2005-06, and 2006-07). These files include demographic variables, school status variables (grade level, school, special education status, limited English proficiency (LEP) status, etc.), attendance, test scores, suspensions, and core course grades.^{iv} Data analyses were conducted specifically for this report and may not match other published analyses exactly.

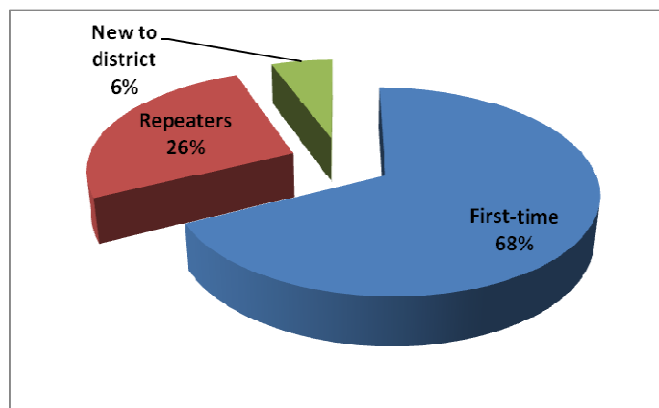
We focused on all ninth grade students in 2007-08, merging in prior years' data on attendance, test scores, suspensions, and middle school grades, as well as school and grade level for those students who were attending school in the district in middle school. Based on these

student-level data, we created several variables describing student outcomes in ninth grade and prior years. This retrospective approach differs from more traditional cohort analyses in that it focuses on all students at a particular grade level in a particular year (distinguishing between first-time ninth graders and repeat ninth graders), and then follows them backward in time through district records. It provides a complementary analysis to the traditional cohort study approach that follows students forward in time.

Descriptive Findings

There were 9297 ninth grade students in Baltimore City Schools records for 2007-08. Prior district records indicated that 26.5 percent of the 2007-08 ninth graders were repeating ninth grade, 67.8 percent were first-time ninth graders in the district, and 5.7 percent had no record of previous attendance in the district. Of the 9297 students, a total of 371 (4%) had withdrawal dates prior to October 1, and were eliminated from further analysis.^v

Figure 1. Distribution of Ninth Graders



Data analyses were prepared specifically for this report and may not match other published statistics.

This report focuses primarily on the 6,662 first-time ninth graders in 2007-08 (including those students new to the district for whom there is no evidence of repeating ninth grade). First-time ninth graders in Baltimore City attended a total of 44 different high schools,^{vi} which can be divided into eight general types (see listing of how schools were coded in Appendix A): a) traditional high schools (four of the original nine geographically-based non-selective zoned comprehensive schools that did not divide into smaller schools); b) smaller “neighborhood” high schools (created by dividing the other five comprehensive high schools into smaller schools); c) contract schools (innovation high schools created by external operators); d) innovation high schools with charter school status; e) vocational-technical high schools with entrance criteria; f) college prep high schools with entrance criteria; g) special education schools; and h) alternative schools. Table 1 summarizes the percentage of first-time ninth grade students at each of these high school types, as well as demographic characteristics of each school type. It is interesting to note that females are underrepresented at the comprehensive and neighborhood high schools (as well as special education and alternative schools), and particularly overrepresented at the selective college prep schools, as well as at contract and charter schools. The traditional and neighborhood high schools also have a significantly higher proportion of special education students than the contract and charter schools and the schools with entrance criteria.

Table 1. Demographic Distribution of First-Time Ninth Graders Among Baltimore High School Types, 2007-08

	Overall	Old (Large) Comprehensive	Smaller Neighborhood (Comprehensives Divided)	Contract	Charter	Vo-Tech	College Prep with Entrance Criteria	Special Ed	Alternative
		1443 (21.7%)	2067 (31.0%)	549 (8.2%)	289 (4.3%)	1012 (15.2%)	1094 (16.4%)	48 (0.7%)	160 (2.4%)
% Female	49.7%	41.1%	44.8%	55.4%	57.4%	51.1%	65.8%	31.3%	45.0%
% FRL	61.2%	64.4%	64.1%	66.8%	60.9%	65.3%	47.6%	62.5%	40.6%
% Special Ed Status	16.2%	21.2%	22.2%	15.7%	15.6%	8.0%	0.9%	97.9%	27.5%
% African American	90.7%	87.1%	92.9%	96.0%	96.5%	94.9%	82.4%	89.6%	96.9%
% New to District	7.3%	8.1%	5.3%	2.0%	3.8%	2.2%	18.0%	2.1%	8.8%

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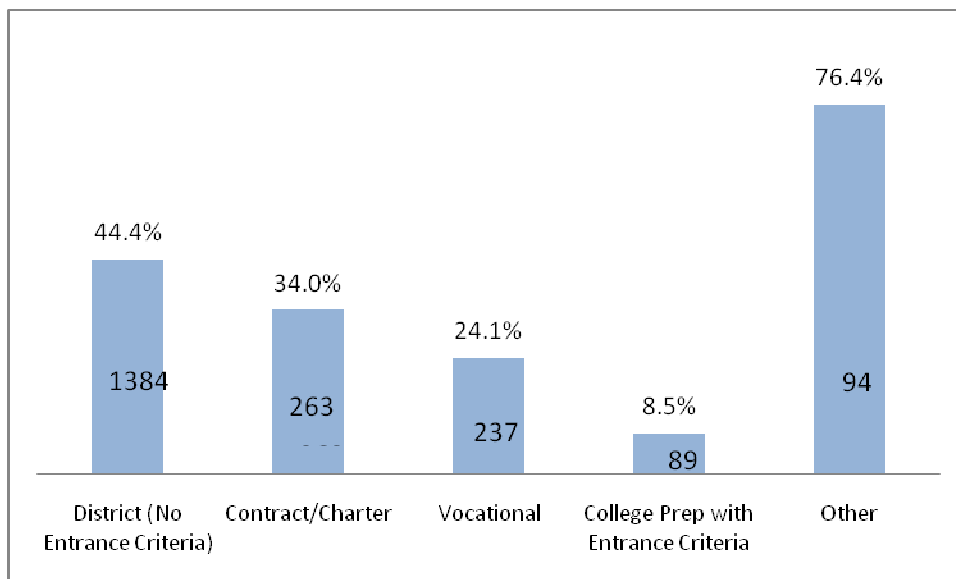
Ninth Grade Early Warning Indicators

Given the prior research that identified absenteeism, behavior problems, and course failure (the “ABCs”) as important early behavioral warning indicators of a dropout outcome (Allensworth & Easton, 2007; Balfanz, Herzog, & Mac Iver, 2007), we sought to determine how many Baltimore students were displaying these “actionable” early warning signs as first-time ninth graders in 2007-08. We also examine overage for grade status, since it has been identified as a strong predictor of non-graduation and can be considered an “off-track” indicator reflecting prior retention in grade (which is an “actionable” policy, even if overage status is not).

Overage for Grade

Students were considered overage for grade if they were 15 or older upon entering ninth grade (born prior to September, 1992 for this cohort entering ninth grade in September 2007). One in three first-time ninth graders (34.2%) were overage for grade. Overage status was significantly higher among males (40.8%) and special education students (51.8%). Figure 2 summarizes the uneven distribution of overage students among high school types.^{vii}

Figure 2. Percentage of First-Time Ninth Graders Who Are Overage, By School Type

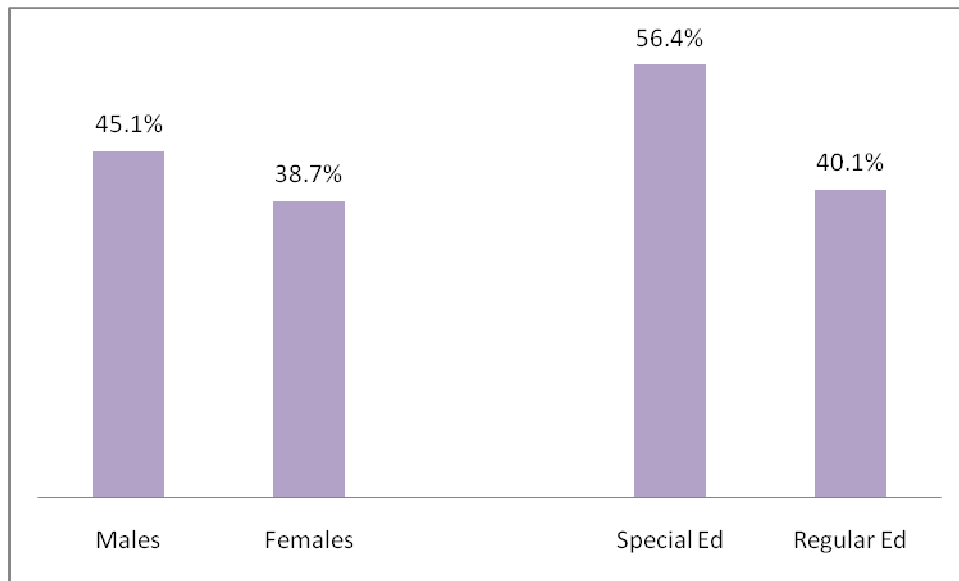


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Chronic Absenteeism

We defined students as chronically absent if they missed more than 20 days^{viii} during 2007-08, or were present less than 8/9 of total days on roll (to include students who may have had a low number of days on roll in the district). Four in ten (41.9%) of all first-time ninth graders were chronically absent in 2007-08. Chronic absenteeism was higher among males than females (45.1% vs. 38.7%) and special education students than regular education students (56.4% vs. 40.1%) (Figure 3).

Figure 3. Percentage of First-Time Ninth Graders Who Are Chronically Absent, By Gender and Special Education Status



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As expected, chronic absenteeism varied significantly among school types, with selective high schools having the lowest rate (8.5%), and the large comprehensive schools having the highest rate (61.4%) after alternative schools (79.2%) and special education schools (70.8%). The second lowest rate of chronic absenteeism was among those attending charter schools (17.3%). But rates of prior chronic absenteeism also differed significantly among the different types of high schools. By design of the selection process, high schools with entrance criteria (both college prep and vocational schools) had a lower percentage of incoming ninth graders who had been chronically absent the year before. It is important to note that charter schools had a significantly lower percentage of incoming ninth graders who had been chronically absent the year prior than did the contract high schools and the traditional and neighborhood schools.

The problem of chronic absenteeism often manifests itself earlier than ninth grade. Among students enrolled in the district the prior year (2006-07), the majority (62.4%) of those chronically absent in ninth grade were also chronically absent in eighth grade the prior year. Indeed, a total of 643 first-time ninth graders were chronically absent in 2007-08 and in each of the three years prior. But nearly 500 of the chronically absent first-time ninth graders were newly falling off-track in attendance as they entered high school (i.e., they had no chronic absenteeism over their prior three years in the district).

Behavior (Disciplinary Problems)

About one in six (16.9%) first-time ninth graders in 2007-08 had at least one suspension that year. Since this measure in sixth grade did not have high predictive yield as an indicator of non-graduation in Baltimore (Plank, Boccanfuso, & Balfanz, 2010), we also calculated rates of “suspension for at least three days.” In fact, most (80.9%) of the first-time ninth graders who

were suspended in 2007-08 had suspensions lasting at least three days (13.7% of the cohort). The majority (72.9%) of those who were suspended for at least three days that year were also chronically absent in 2007-08. This disciplinary problem indicator was much more prominent among males than females (16.9% vs. 10.4%) and special education than regular students (18.6% vs. 12.7%).

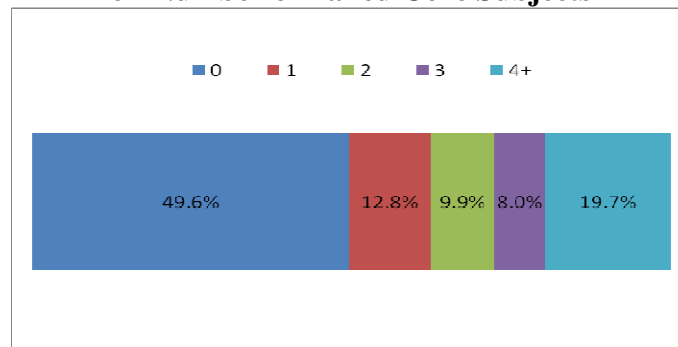
To what extent was chronic absenteeism driven by suspension? Nearly one in four (23.8%, 664 students) of those first-time ninth graders who were chronically absent in 2007-08 had been suspended for at least three days. But for the large majority (76.2%) of chronically absent students, attendance problems were not related to suspension. Among the chronically absent students who had been suspended for three or more days, half (49.4%) had been suspended for six or fewer days, and three-quarters (76.2%) had been suspended for 20 or fewer days. There was a group of 158 first-time ninth graders (2% of the entire cohort) who missed more than 20 days of school due to suspension in 2007-08.

Suspensions during the middle grades were significantly related to chronic absence in ninth grade. A majority (60.2%) of those who had been suspended at any time during middle school were chronically absent in ninth grade, compared to just a third (33.0%) of those who hadn't been suspended in middle school who had chronic absence problems in ninth grade. While the relationship is strong, less than half (47.0%) of those chronically absent in ninth grade had a record of suspension anytime in the previous three years (compared to 22.4% of non-chronically absent ninth graders with a suspension during the past three years). The majority of chronic absenteeism in ninth grade was not related to suspension, though suspension in the middle grades could be a major contributing factor for a large number of chronically absent students.

Course Failure

Final course grades were available for core academic courses (math, English, science, and social studies) for the majority (89.2%) of first-time ninth grade students.^{ix} Course grades were coded as failing if the grade received was below a 60. Half (50.4%) of all first-time ninth graders with course grade data failed at least one core course, and nearly four in ten (37.6%) failed two or more core courses. Figure 4 shows the distribution of students failing zero, one, two, three, or four or more core courses.

Figure 4. Distribution of First-Time Ninth Graders on Number of Failed Core Subjects



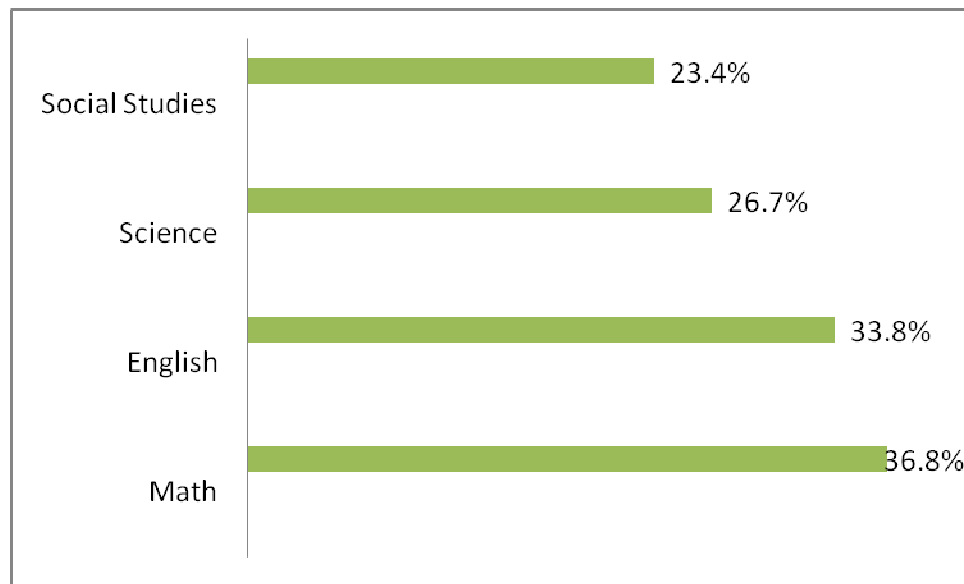
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two, three, or four or more core courses.^x One in five students (19.7%) failed four or more core courses, one in twelve failed a total of three courses, one in ten failed two courses, and one in eight failed just one course.

Figure 5 summarizes the percentage of first-time ninth graders failing each core course subject. Failure rates were higher among math and English than science and social studies.

It is important to keep in mind that students must recover credits toward graduation for courses that they fail. When we examine course failure from the perspective of number of course credits that need to be recovered among first-time ninth graders in 2007-08, there were a total of 9,165 failed course credits among the first six grades in math, English, science, and social studies courses.^{xi} We return to the implications of this finding later in this report.

Figure 5. Percentage of First-Time Ninth Graders Failing Core Subjects



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Males were more likely than female students to fail at least one course (58.2% vs. 42.9%). Special education students had a higher failure rate than regular education students (68.4% vs. 47.4%). Overall, the failure rate of students eligible for free/reduced price lunch was higher than for those not eligible, but this resulted in a significant difference only among students enrolled in selective schools.

As expected, incidence of course failure varied dramatically by school type. Two-thirds of first-time ninth graders at the non-selective “neighborhood” high schools failed at least one core course, and six in ten at the large comprehensive high schools had at least one failure. By contrast, only one in seven (14.5%) students at selective schools had a failing grade. The failure rate at charter schools (35.5%) was lower than the rate at vocational schools (48.8%) or contract schools (54.2%). We address these differences, and how they are related to prior student characteristics, more fully in a later section of this report.

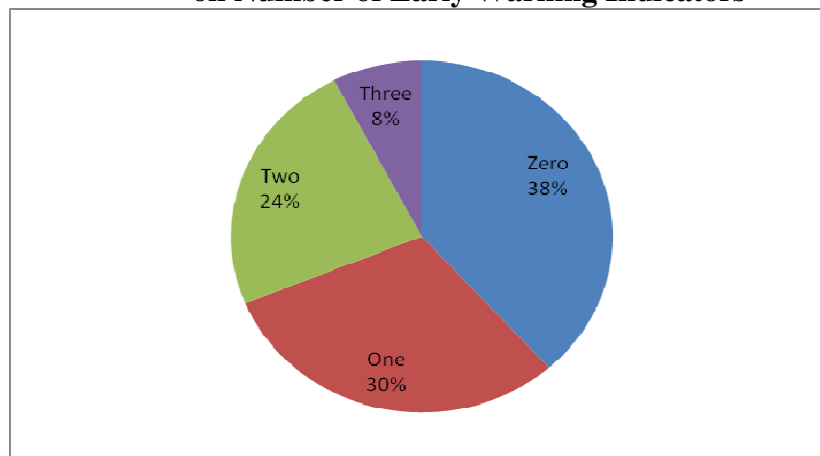
While course failure was strongly related to attendance (correlation of -0.6), a relatively large minority (40.4%) of students with at least one failure were not chronically absent (had 20 or fewer absences), and one in five had attendance of at least 95 percent. Thus, an appreciable number of ninth graders are failing core courses despite regular attendance.

Though course failure in ninth grade was related to failing math or reading/language arts (RELA) in eighth grade (the prior year), there were numerous ninth graders whose course failure would not have been expected. More than half (53.9%) of those failing at least one core course in ninth grade had passing grades in reading and math in eighth grade, while an additional 20.7% had no course data available from the prior year.^{xii} Just one in four (25.5%) of those failing any core course in ninth grade had a record of failing math or RELA the prior year.

Early Warning Indicator (EWI) Scale

Based on the three behavioral early warning indicators of a non-graduation outcome (chronic absenteeism, behavior problems, course failure), we created a scale ranging from zero (no indicators) to three (displaying all three indicators) for students with data on each measure.^{xiii} Figure 6 represents how first-time ninth grade students are distributed on this scale. Though only a handful (7.6%) had all three indicators, the majority manifested at least one behavioral risk factor. When analyses include all first-time ninth graders in 2007-08 who had data on at least one of the indicators, 63.5 percent had at least one early warning risk indicator.

Figure 6. Distribution of First-Time Ninth Graders on Number of Early Warning Indicators



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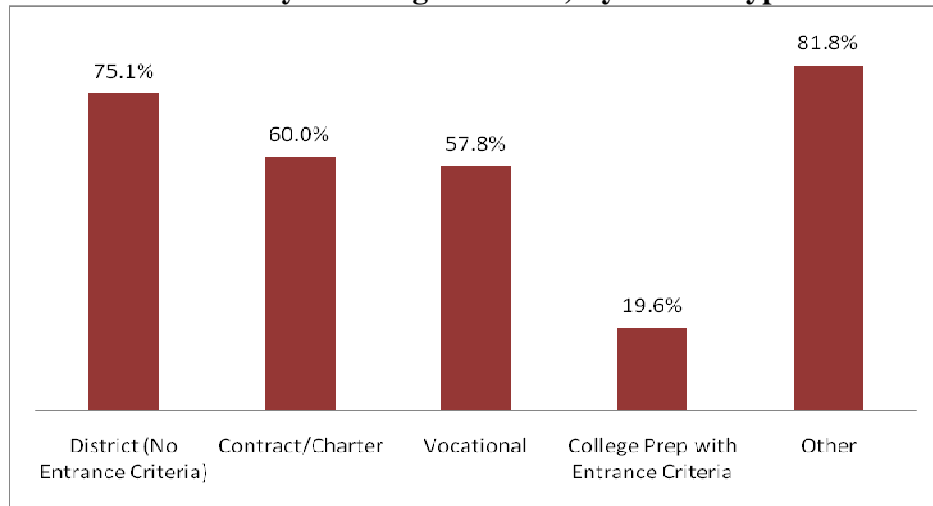
As was the case for each of the component measures of the EWI scale, having at least one early warning indicator was more common among males than females and special education students than regular students. Figure 7 shows the variation by school type. Among the regular non-selective schools, three-quarters of students had at least one early warning indicator.

Eighth Grade Early Warning Indicators

We also created a scale for early warning indicators in eighth grade (2006-07) for these first-time ninth graders in 2007-08, based again on chronic absenteeism, behavioral problems (suspension for at least three days), or course failure in either math or reading/language arts.^{xiv}

Among students with data for all three indicators,^{xv} half (50.2%) had no warning signs in eighth grade, one in four (26.7%) had just one, one in six (17.0%) had two indicators, and fewer (6.0%) had all three warning flags.

Figure 7. Percentage of First-Time Ninth Graders With At Least One Early Warning Indicator, By School Type

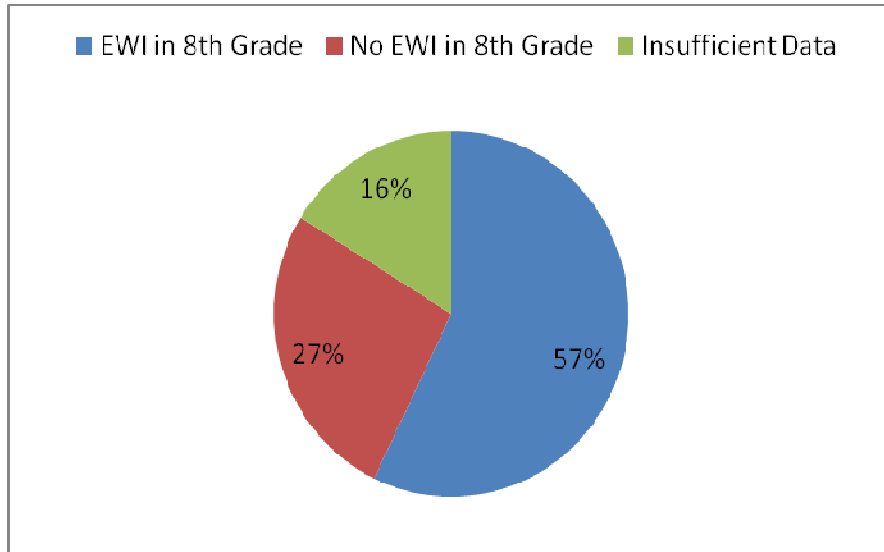


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Because of the large number of students with missing data (either because of not being enrolled prior to the ninth grade year in the district, or otherwise missing eighth grade course grades), we also calculated an eighth grade early warning variable coded as: no warning indicators (37.9%), at least one indicator (42.0% of cohort), and insufficient prior data (20.1%).^{xvi}

More than half (57.2%) of those with an early warning indicator (EWI) in ninth grade had evidence of an early warning indicator the year before. About a quarter (26.6%) of those with a ninth grade EWI had no warning signs the year before, and the rest (16.2%) had insufficient prior data (Figure 8).

Figure 8. Incidence of an Eighth Grade EWI among First-Time Ninth Graders Who Had At Least One EWI



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While student warning signals in eighth grade were not a perfect predictor of warning signals during the ninth grade year, 85 percent of those students with an indicator in eighth grade also had one in ninth grade.

Table 2 below summarizes how the first-time ninth graders^{xvii} were distributed according to risk factors in both eighth and ninth grades.

Table 2. Distribution of Eighth and Ninth Grade Risk Indicators for 2007-08 First-Time Ninth Graders

	No eighth grade risk factors	One or more eighth grade risk factors	Insufficient prior year's data	Total
No ninth grade risk factors	1384 (21.4%)	411 (6.4%)	566 (8.8%)	2361 (36.5%)
One or more ninth grade risk factors	1093 (16.9%)	2347 (36.3)	666 (10.3%)	4106 (63.5%)
Total	2477 (38.3%)	2758 (42.7%)	1232 (19.1%)	6467 (100%)

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The largest group of students (2347) had early warning indicators in both eighth and ninth grades, followed by the students who had no risk factors either year (1384). Almost eleven hundred students fell off-track in ninth grade with no eighth grade risk factors, but more than half of that group had a risk indicator at least one of the two years prior to eighth grade.

A small percentage (6.4%) of students (but more than four hundred total) displayed resiliency, finishing ninth grade with no early warning signs even though they had exhibited an indicator in eighth grade. Analyses indicated that the proportion (23.1%) of these resilient students attending newly created high schools (contract or charters schools) was nearly twice the proportion of all first-time ninth graders attending those schools (12.6%). This suggests it is important to explore whether practices at these newly created high schools can be credited with helping students to recover from prior problems. The resilient group had a slightly higher proportion of females than males (53.3% vs. 46.7%) and slightly lower percentage of special education students than the ninth grade class overall (13.9% vs. 14.7%).

Warning Signals Before Eighth Grade

Building on previous findings regarding the importance of the sixth grade, the first year of the middle grades, in analyses of early warning indicators (Balfanz, Herzog, & Mac Iver, 2007), we analyzed to what extent Baltimore students with off-track indicators in ninth grade could be identified three years earlier, when they were (primarily) in sixth grade. Analyses indicated that more than half (53.0%) of the 4106 ninth graders with early warning signals in 2007-08 could be identified by an early warning signal in 2004-05. One quarter (22.9%) did not exhibit any indicators in the sixth grade year, and another quarter had insufficient data available in 2004-05.

While student warning signals in 2004-05 (primarily sixth grade) were not a perfect predictor of warning signals during the ninth grade year, eight in ten of those students with an indicator in 2004-05 also had one in ninth grade. Similarly eight in ten of those students with an indicator in 2005-06 (primarily seventh grade) also had one in ninth grade.

Predicting Course Failure

Given the prior research findings on the importance of ninth grade course failure as a determinant of non-graduation outcomes, we explored the factors associated with course failure through multivariate analyses that took into consideration the fact that students were nested within non-selective schools (see Appendix B for a more detailed description of these analyses). The strongest predictor of course failure is absenteeism in ninth grade. Being suspended for at least three days in ninth grade also has a significant (though weaker) effect on failure. Having an early warning indicator in eighth grade (chronic absence, suspension, or core course failure) and eighth grade test scores are also significant predictors of failure, though these relationships are considerably weaker than the impact of absenteeism. Males still have a significantly higher failure rate than females even when we control for the fact that they have higher rates of characteristics related to failure: higher absenteeism in ninth grade, higher rates of early warning indicators (absences, behavior, and course failure) in eighth grade, lower eighth grade test scores, and overage status.

While there is wide variation among non-selective schools in the percentage of first-time ninth grade students failing one or more core courses, most of this variation is explained by variation in the demographic and prior behavioral characteristics (eighth grade attendance, behavior, and course performance) of the ninth grade students. That is to say, the differences in

failure rate observed between high schools are primarily due to the pre-existing characteristics of their students. (This is particularly the case for charter schools, whose students have significantly higher middle school attendance than other non-selective schools.) The small amount of variance in course failure rates that can be attributed to schools (once student characteristics are controlled) could be due to particular practices aimed at increasing attendance and course passing that are implemented at the school level. Further qualitative study of these outlier schools could be useful for increasing understanding of effective practices.

Conclusions and Policy Implications

The majority of first-time ninth graders in Baltimore City have at least one early warning indicator of a non-graduation outcome – primarily absenteeism and course failure. Research in other urban districts has found that while some students go on to recover from problems in ninth grade and manage to graduate, the majority do not. The district goal of increasing the graduation rate will require intensive attention particularly to increasing attendance and course passing rates among ninth graders. Since chronic absenteeism in ninth grade is closely related to chronic absenteeism in the middle grades, concerted efforts to improve student attendance patterns prior to high school are also crucial.

The number of students chronically absent in sixth grade has declined notably over the past several years (Plank, Boccanfuso, & Balfanz, 2010), but one in five middle grades students still misses more than 20 days of school.¹ At present, middle grades schools vary dramatically in the percentage of students chronically absent, ranging from zero percent to more than 60 percent (with a mean district-wide of 20 percent of students in grades six to eight absent more than 20 days during 2008-09). Whatever the size of the attendance problem at particular schools, school leaders need to be equipped with strategies and resources to implement interventions that will be effective in increasing student attendance.

The district's Master Plan already includes numerous action steps designed to increase attendance, as well as additional supports for schools with the highest levels of chronic absenteeism. District and school leaders are actively seeking to implement strategies that will lead to improved outcomes. While there is considerable discussion underway of the steps being taken, it is important for the district to consider a more formal analysis of ongoing efforts to increase attendance. What is actually being implemented, and to what degree? What are the barriers to implementing certain strategies and how can they be overcome? What impacts are various strategies having? What resources are needed to yield a significant increase in student attendance?

Similarly, while the Master Plan also notes the need to address course failure, it is crucial to collect systematic data on what schools are actually doing to prevent course failure as well as to provide credit recovery options for students who need them. This is particularly important given the significant additional costs associated with credit recovery (for nearly 27,000 core courses failed at Baltimore City high schools grades 9-12 in a single academic year). While some course failure is directly linked to students' irregular attendance, other course failure seems to have different roots. These findings highlight the complexity of designing interventions to

¹ This figures and those following are based on analyses conducted specifically for this report from 2008-09 data, and may differ somewhat from other published statistics.

ninth-grade course failure, and remind us that multiple strategies will be needed if all students are to be supported. BERC is currently planning a study involving analysis of school and classroom practices associated with higher levels of ninth grade course passing in Baltimore's schools.^{xviii} An additional BERC study of the district's efforts to increase attendance would provide useful information for future data-driven decision making.^{xix}

We believe that formal analysis of the current efforts underway to address attendance and course failure in particular will also help district leaders to understand the need for better integration of multiple programs and strategies into a more systematic framework for dropout prevention. Implementation of early warning systems (such as those in Chicago Public Schools^{xx}) and public health-style tiered prevention models designed to keep students from falling off-track to graduation (particularly in terms of credits accrued) will be an important step for increasing the district's graduation rate (Mac Iver & Mac Iver 2009; Mac Iver, Balfanz, & Byrnes, 2009). Assessing the effectiveness of current interventions is the next step in the "cycle of inquiry," a fundamental practice of a well-functioning school district "learning community" (Senge, 1990).

Appendix A. Coding of Schools

Old Comprehensive

Northwestern High School-401
Patterson High School-405
Forest Park Senior High-406
Frederick Douglass High School-450

Neighborhood

Digital Harbor High School-416
W.E.B. Dubois High School-418
Reginald F. Lewis School for Business & Law-419
Dr. Samuel L. Banks High School-420
Thurgood Marshall High School-424
Heritage High School-425
Doris M. Johnson High School-426
Vivien T. Thomas Medical Arts Academy-429
Augusta Fells Savage Institute for Visual Arts-430
Maritime Academy-431
Homeland Security High School-434
Business and Entrepreneurship Academy -435
Liberal Arts Academy-436

Innovation - Contract

New Era Academy-422
Baltimore Freedom Academy-423
Academy for College and Career Exploration High School-427
Baltimore Talent Development High School-428
Renaissance Academy-433

Innovation - Charter

Coppin Academy-432
ConneXions Leadership Academy - 325
Md Academy of Tech and Health Sciences - 331
Independence School Local 1 - 333

Vocational (with Entrance Criteria)

Edmondson Westside High School-400
Mergenthaler Vocational Technical High-410
The National Academy Foundation HS-421
Carver Vocational Technical High-454

College Prep (with Entrance Criteria)

Baltimore Polytechnic Institute-403
Western High School-407
The New Paul L Dunbar High School-414
Baltimore City College High School-480
Baltimore School for the Arts - 415

Special Ed

Central Career Academy At Briscoe-451

George McMechen - 177

Claremont School – 307

Upton School - 301

William S. Baer - 303

Alternative

Francis M. Wood - 178

Harbor City High School-413

Laurence G. Paquin Middle/High-457

Alternative Learning Center -488

Baltimore City Detention Center - 884

Appendix B

To understand the factors associated with ninth grade course failure, we conducted analyses using two-level hierarchical linear modeling (HLM) to take account of the fact that students were nested within schools.² Given the significantly different student populations in different types of schools, we focused on just the non-selective schools (excluding vocational and college preparatory schools with entrance criteria as well as alternative and special education schools). In addition, only students with data from the prior year (2006-07) were included. The sample was thus comprised of 2985 students from 26 non-selective schools (large comprehensive, small neighborhood, contract, and charter schools).

The dependent variable in analyses was number of ninth grade failures in core courses, ranging from zero to four or more. Student-level predictive variables included ninth grade attendance (percentage of days attended), suspension for three or more days in ninth grade (coded 1 if yes, 0 if no), having at least one early warning indicator (chronic absenteeism, suspension of three or more days, course failure in math or language arts) in eighth grade the prior year (coded 1 if yes, 0 if no), scale score on the eighth grade mathematics MSA, gender (coded 1 for male, 0 for female), and overage status (coded 1 if yes, 0 if no). Preliminary analyses indicated that special education status was not significant once test scores were controlled. We also did not include ethnicity or free lunch status³ because of low levels of variation on these variables.

During preliminary analyses, the following potential school-level predictive variables were considered for inclusion by testing whether a model containing that variable alone was a significant improvement over the null model: Whether the school was district-operated (coded 1) or was operated by one of the district's external partners as a contract or charter school (coded 0); the school's student attendance rate; the percentage of special education students in the school; the school's ninth-grade enrollment; the school's total enrollment; and the school's percentage of conditionally certified teachers. Only two of the school-level predictors were significant predictors of the mean number of core courses failed by ninth graders in that school: whether the school was district operated or not and the school's attendance rate. The mean number of courses failed by ninth-graders was two-thirds of a course higher in district-operated than in partner-operated schools. An increase of ten percentage points in a school's attendance rate (e.g., from 83% ADA to 93% ADA) was associated with a two-fifths of a course decrease in the average number of courses failed. These two school-level predictors, however, lost their predictive power in subsequent models that included the full set of student-level predictors of interest. In other words, knowing whether a school is district- or partner-operated and its attendance rate did not explain any variation in the number of courses failed beyond what could

² Students were coded according to their final school. A total of 311 students within this sample attended more than one school during 2007-08.

³ Since analyses indicate that Baltimore students who have previously been eligible for free/reduced price lunch frequently are not classified as eligible during high school, we constructed a free lunch status variable using data over time. In non-selective schools there was little variability of interest in this variable.

be explained by a model that included only information on student-specific predictors and risk indicators.

Table B1 summarizes the series of models estimated to explain the variation in ninth grade failure, compared to the null model. Model 1 included only the impact of prior student-specific variables (gender, overage status, eighth grade test score, and eighth grade early warning indicator) on ninth grade failure. This model represented a 21% reduction in variance compared to the null model. Among these prior predictors, having an eighth grade early warning indicator (chronic absenteeism, suspension or core course failure) was the strongest. But gender and overage status were still significant predictors, even controlling for eighth grade test score and warning indicators.

Model 2 adds two ninth grade student-level measures to the prior student characteristics: ninth grade attendance and whether or not the student was suspended for at least three days during ninth grade. As the comparable effect size statistics indicate, ninth grade attendance is by far the strongest predictor of ninth grade failure. But the other variables, including gender and overage status, remain significant predictors of failure, even when attendance is controlled. Model 3 expands Model 2 to add the school level variable indicating whether or not the student's ninth grade school was district-operated. Model 4 expands Model 2 to add the school level variable, attendance rate. Neither Model 3 nor Model 4 are significant improvements over the Model 2.

This series of models indicates that while ninth grade attendance explains the largest proportion of variation in ninth grade failure, other prior student characteristics and behaviors are still significantly related to failure. Once these are controlled, the effects of school operator and school attendance rate are not significant. At the same time, as the presentation of variance components in Table B1 indicates, ninth grade failure varied significantly between schools, even controlling for student level variables. For example, in Model 2 a total of 14 percent of the unexplained variation in number of courses failed is found between schools (86 percent is between students). This suggests that there could be other school-level practices or characteristics that are affecting student course failure. In a future BERC qualitative study in Baltimore, we plan to explore these potential effects more fully.

Table B1. Estimated Fixed Effects, Effect Sizes, and Variance Components for Models of the Predictors of the Number of Ninth Grade Courses Failed

Parameter	Null Model	Model 1		Model 2		Model 3		Model 4	
	Coefficient (SE)	Coefficient (SE)	Effect Size	Coefficient (SE)	Effect Size	Coefficient (SE)	Effect Size	Coefficient (SE)	Effect Size
Intercept	1.60 (0.11)	1.63 (0.10)		1.65 (0.09)		1.65 (0.09)		1.66 (0.09)	
Level 1 – Student-specific predictors/risk indicators									
Percentage of days attended in 9 th Grade				-0.05 (0.00)	Stand. Coef. = -0.50	-0.05 (0.00)	Stand. Coef. = -0.50	-0.05 (0.00)	Stand. Coef. = -0.50
Student was suspended 3 or more days in 9 th Grade				0.40 (0.07)	Cohen’s d = 0.24	0.40 (0.07)	Cohen’s d = 0.24	0.40 (0.07)	Cohen’s d = 0.24
Student displayed an “early warning indicator” in 8 th grade		0.84 (0.06)	Cohen’s d = .51	0.37 (0.04)	Cohen’s d = 0.23	0.37 (0.04)	Cohen’s d = 0.23	0.37 (0.04)	Cohen’s d = 0.23
Student is male		0.38 (0.09)	Cohen’s d = 0.23	0.33 (0.07)	Cohen’s d = 0.20	0.33 (0.07)	Cohen’s d = 0.20	0.33 (0.07)	Cohen’s d = 0.20
Math performance on the 8 th grade MSA		-0.02 (0.00)	Stand. Coef. = -0.25	-0.01 (0.00)	Stand. Coef. = -0.19	-0.01 (0.00)	Stand. Coef. = -0.19	-0.01 (0.00)	Stand. Coef. = -0.19
Student is overage		0.33 (0.07)	Cohen’s d = 0.20	0.19 (0.06)	Cohen’s d = 0.12	0.19 (0.06)	Cohen’s d = 0.12	0.19 (0.06)	Cohen’s d = 0.12
Level 2 – School-specific predictors									
School is district-operated						0.05 (0.22)	Cohen’s d = 0.03		
School’s student attendance rate								0.01 (0.01)	Stand. Coef. = 0.06
Random Effect	Variance Component	Variance Component		Variance Component		Variance Component		Variance Component	
Intercept, U ₀	0.29***	0.24***		0.22***		0.23***		0.22***	
Level 1, r	2.47	1.95		1.37		1.37		1.37	
Proportional reduction in error (versus null model)	--	0.21		0.42		0.42		0.42	

Analyses include first-time ninth graders in non-selective schools, 2007-08. The dependent variable, number of course failures, ranges from zero to four or more. Results using dichotomous failure variables in binary logistic regression HLM analyses (no courses versus one or more courses failed; one or fewer versus two or more courses failed) produced virtually the same results.

Endnotes

ⁱ A Baltimore City ninth grade cohort study similar to research conducted in other districts is currently being conducted by the lead author of this study, with funding from the Council of the Great City Schools. Preliminary results indicate that the ninth grade risk factors identified in other districts (particularly attendance and course failure) are also significant predictors of student graduation outcomes in Baltimore.

ⁱⁱ While some may view course grades as cognitive indicators, we view passing high school courses as primarily a result of student behaviors influenced by motivation. Required student behaviors can be categorized roughly as: 1) attendance, 2) paying attention, 3) completion of class work, 4) completion of homework, 5) studying. A qualitative study focused on the relationship between student motivation and effort, classroom practices, and course failure is planned as part of the BERC research agenda.

ⁱⁱⁱ A Baltimore City ninth grade cohort study similar to research conducted in other districts is currently being conducted by the lead author of this study, with funding from the Council of the Great City Schools. Preliminary results indicate that the ninth grade risk factors identified in other districts (particularly attendance and course failure) are also significant predictors of student graduation outcomes in Baltimore.

^{iv} We are in the process of obtaining access to the full course history files, and will update this report after analyses with those data are completed.

^v Most of these students (200) were repeating ninth graders, and only a handful (7) were new to the district. It is important to note that among repeat ninth graders, 59% of these pre-October withdrawals had dropout codes, and an additional 7.5% had a transfer to juvenile justice system. Among first-time ninth graders, 23.1% of these withdrawals were dropouts.

^{vi} Six of those schools had fewer than 30 first-time ninth graders. Students were coded according to their final school on record. A total of just 8.6% (571 students) attended more than one school in 2007-08 (had more than one administrative record). Most of these attended two schools; fewer than 1% attended three or more schools. Three-quarters of the students who attended more than one school were concentrated in the comprehensive or neighborhood schools as their final school, and most of the rest were in alternative schools.

^{vii} Date of birth data (month and year) were available for 89.2 percent of the first-time ninth graders, and when we also used grade level data from prior years indicating retention in grade, it was possible to calculate “overage for grade” status for 90.6 percent of cases. With missing cases included, there were 30.9% overage for grade students, and 9.4% with missing data.

^{viii} Percentage of students missing more than 20 days is routinely reported by the Maryland State Department of Education, though MSDE reports are restricted to only those students attending a particular school for more than 90 days.

^{ix} Most of the 720 students missing course data had withdrawal codes from the district, and 208 of these had dropout codes. Of the 156 students missing data who had not withdrawn from the system, 59.6% were designated as special education. Of the remaining 63 non-special education students who were missing course data, the majority (41 students) were from either School 403 (Polytechnic) or School 884 (Baltimore Detention Center).

^x While almost all students at selective schools and some other schools had just four course marks (and most students at Baltimore School for the Arts (BSFA) had just three marks), most students at the comprehensive schools had five or six course marks, having more than one course in a core subject (often an extra course designed to build essential skills). Since students had different numbers of course marks, we created a course failure scale ending in “failed four or more core courses.” Since no student at BSFA failed more than two courses, this scale appears to be justified even for those few students who had the opportunity to fail only three courses.

^{xi} Students in schools without entrance criteria tended to have at least one and sometimes two additional courses in the four core subject areas, for a total of four or five. Among all high school students in grades 9-12, the total number of failed course credits requiring recovery was 26,869 among the first six core courses taken by each student in 2007-08. There were probably more failed courses among the other non-core subjects as well. Further analyses will be conducted when full course files become available.

^{xii} Of the students with missing data on course grades for 2006-07, half (50.5%, 817 students) were enrolled in the district but grades were not recorded in the files. Many of these were concentrated in certain schools.

^{xiii} Here we follow Balfanz, Herzog, and Mac Iver (2007) rather than Plank, Boccanfuso, & Balfanz (2010), leaving overage for grade status out of the EWI scale. Students who were missing grade data were excluded when calculating this EWI scale, but those with evidence of chronic absenteeism or suspension were included in the calculation of “at least one EWI.”

^{xiv} Selection of math or reading/language arts course failure is based on findings from Balfanz, Herzog, & Mac Iver, 2007.

^{xv} A quarter of first-time ninth graders did not have complete eighth grade data, either because they were not enrolled in the district (816 students) or course grade data were missing for enrolled students (817 students). While attendance and suspension data were available for all enrolled students, course grade data were available for 87.7% of enrolled students. Missing data were somewhat concentrated in particular schools, and so not randomly distributed. Analyses of missing data will be incorporated into the final version of this report.

^{xvi} Students enrolled in the district in 2006-07 who had no warning indicator for attendance or suspensions, but who were missing course grades, were coded as “insufficient prior data.” Those missing course grades but who had another warning indicator were included with “at least one indicator.”

^{xvii} Ninth graders with missing course grade data who had no other warning signals were excluded from this table of percentages.

^{xviii} A proposal to the W. T. Grant Foundation is currently under consideration to fund a study approved by the BEREC Executive Committee.

^{xix} See Mac Iver & Farley-Ripple, 2009.

^{xx} Gewertz, 2009.

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