ISSUE BRIEF

Developing Early Warning Systems to Identify Potential High School Dropouts

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The high school dropout problem has been called a national crisis. Nearly one-third of all high school students leave the public school system before graduating (Swanson, 2004), and the problem is particularly severe among students of color and students with disabilities (Greene & Winters, 2005; U.S. Department of Education, 2006). Educators, researchers, and policymakers continue to work to identify effective dropout prevention approaches. One important element of such prevention efforts is the identification of students at highest risk for dropping out and then the targeting of resources to keep them in school. An early warning system that uses **indicators based on readily accessible data** can predict, during students' first year in high school, whether the students are on the right path toward eventual graduation.

Research is clear that ninth grade is a "make or break" year. More students fail ninth grade than any other grade in high school, and a disproportionate number of students who are held back in ninth grade subsequently drop out (Herlihy, 2007). Recent research in large urban school districts, including Chicago and Philadelphia, provides information about powerful indicators that can predict, by the end of the first year of high school, or even during the first semester, whether students will complete high school. This brief guide reviews this research and uses it as a basis for providing guidance to schools and districts about using data to address the dropout problem.

The information that follows and an accompanying tool developed by the National High School Center can help schools and districts to systematically collect early warning indicator data so they can identify students at highest risk of dropout. An early warning system can be implemented at the school as well as at district levels. The role of the state is critical for providing support that can help districts and schools collect the key information with relative ease, including the use of integrated longitudinal data systems.

This guide, intended for educators and policymakers at the school, district, and state levels, is designed to provide information about the following:

- Factors that contribute to a student's dropping out (p. 1)

- Research on early warning indicators (pp. 1–2)

- School-level early warning systems (pp. 2–7)

  - Step-by-step instructions for how schools can calculate indicators and identify which students are on track to graduate and which are most likely to drop out while there is still time to intervene and prevent dropouts

- District-level early warning systems (pp. 7–10)

  - Information for districts regarding the development of district-wide early warning systems that begin with a local analysis of graduation and dropout patterns in the district

- States' roles in supporting the development and use of early warning systems (pp. 11–12)

IDENTIFYING THE EARLY WARNING INDICATORS

The most powerful predictors of whether a student will complete high school include **course performance** and **attendance** during the first year of high school (Allensworth & Easton, 2005; 2007). Therefore, systematic collection of student attendance and course performance data can be used to develop an effective early warning system that can also be tailored to local contexts.

There are several ways to use course performance information to gauge students' likelihood of graduating or dropping out. One of the most powerful is to calculate a version of the "on-track indicator" that has been customized to fit local contexts.[1] The Consortium on Chicago School Research introduced the "on-track indicator" in 2005 by combining two highly predictive ninth-grade risk factors: course credits earned and course grades. First-year high school students in the Chicago Public Schools are classified as "on track" if they earn (a) at least five full-year course credits and (b) no more than one F in one semester in a core course during the first year of high school. On-track students are more than 3.5 times more likely than students who are off track to graduate from high school in 4 years (Allensworth & Easton, 2005).

The on-track indicator reflects students' academic performance **during their first year of high school,** a critical transition period in the education pipeline. In Chicago, the on-track indicator is a better predictor of graduation than students' background characteristics or middle school achievement test scores. For example, Chicago students who are in the highest quartile in eighth-grade achievement scores but fall off track in their freshman year are far less likely to graduate than students who were in the lowest quartile on eighth-grade achievement but are on track at the end of freshman year (Allensworth & Easton, 2007).

Attendance during the first year of high school is also directly related to high school completion rates. Even moderate levels of absences (1–2 weeks in the first semester of high school) are associated with lower rates of high school graduation (Allensworth & Easton, 2007). The biggest risk factor for failing ninth grade is the number of absences during the first 30 days of high school, and failing ninth grade is one of the most important predictors of dropping out (Neild & Balfanz, 2006).

These indicators can be calculated and tracked early in students' high school careers, when there is still time to intervene with students who are off track.

Why is an early warning system important?

- Early warning systems use **routinely available data** housed at the school that are good predictors of whether a student is likely to drop out of high school.

- The on-track indicator (based on course performance) is a better predictor of likelihood to graduate than are background characteristics or previous achievement test scores.

- First-month, first-quarter, and first-semester absences are additional strong predictors of drop out; these data are available early in the school year.

  Districts and schools can use this information to target interventions that support off-track students while they are still in school, before they drop out.

- Districts and schools can use the information to look for patterns and identify school climate issues that may contribute to disproportionate dropout rates at a subset of high schools or within subpopulations of students. (See Osher et al., 2007, for a review of strategies that support conditions for learning and academic achievement.)

DEVELOPING AN EARLY WARNING SYSTEM AT THE HIGH SCHOOL LEVEL

A useful early warning system relies on student information that exists at the school level. The system houses two main types of information: attendance (i.e., number of absences) and course performance (i.e., number of Fs, course credits earned, and freshman grade point average [GPA]). This information may be housed already in electronic databases; in some cases, this information may have to be recorded into the early warning system for the first time.

ISSUE BRIEF

ISSUE BRIEF

Attendance

Information about absences may be the most practical indicator for identifying students in need of early interventions (Allensworth & Easton, 2007). The number of absences per student can be monitored very early in the first year of high school—attendance even in the first few weeks or month of the freshman year is related to whether students will eventually graduate (Neild & Balfanz, 2006). The early warning system would include the **number of days absent** or the **daily attendance rate** at regular intervals during the freshman year, e.g., the first 20 days and each quarter (or trimester).

High schools vary in the ways they calculate the number of absences or the daily attendance rate. In high schools that take attendance at multiple points in the day (e.g., once per class period), absences can be counted on a course-by-course basis and then aggregated into a total number of days absent. For example, if a student misses one of eight courses in a day, one-eighth of a day of absence is counted for that student. That is, attending partial days by attending some but not all courses counts as a fraction of the total day.

✔ **Attendance Benchmarks.** In general, research suggests that missing more than 10% of instructional time is cause for concern (Allensworth & Easton, 2007). This percentage translates to roughly 2 weeks (10 days) of school per semester in most high schools. An early warning system might monitor attendance for first-year students based on a 20-day count and then on a quarterly basis. At any of these time points, *students who miss more than 10% of instructional time should be flagged for possible early intervention.*

Course Performance

By the end of the first semester, course grades and failure rates are slightly better than attendance as predictors of whether students will graduate (Allensworth & Easton, 2007). **Three** main pieces of information related to course performance should be included for each student in a strong early warning data system. The systematic collection of the data allows schools to track **three** early warning indicators.

THREE TYPES OF COURSE PERFORMANCE DATA TO RECORD

1. **Freshman Course Failures, particularly in core academic courses.** At the end of each quarter,[2] semester, or trimester, as appropriate, the system should include the number of Fs earned per term for each student. Early warning indicators include failures in *any* course, as well as the on-track indicator which is based on the number of Fs earned in *core academic courses*. Therefore, the data system should include—for each first-year high school student—separate fields for

    (a) The total number of Fs in all courses, and

    (b) The total number of Fs in core academic courses.

2. **Freshman Grade Point Averages.** At the end of each quarter, semester, or trimester, as appropriate, and for the full cumulative first year, the system should include each student's GPA as it is reported on their report card.[3]

3. **Credits Earned in each term.** At the end of each quarter, semester, or trimester, as appropriate, the system should include the total number of credits accumulated per term for each first-year high school student.

THREE COURSE-PERFORMANCE EARLY WARNING INDICATORS TO TRACK

The above three types of course-performance data, recorded into the data system for each first-year student, can then be used to calculate early warning indicators based on (a) semester course failures, (b) GPA, and (c) on-track vs. off-track status.

✔ **Failed Course Benchmarks.** Research from Chicago indicates that students who fail one or more courses in the fall semester of their first year of high school are less likely to graduate than students who do not. In Chicago Public Schools, 85% of students with zero semester course failures in their freshman year graduated 4 years later, but only 70% of students with one semester F and only 55% of students with two semester Fs graduated in 4 years. Students with three or more semester Fs are not likely to graduate high school (Allensworth & Easton, 2007). Since effective early warning systems monitor course failures for first-year students every term, *students with one or more Fs in any course should be flagged for possible early intervention.*

✔ **Grade Point Average Benchmarks.** Grades earned are clearly related to students' likelihood of successfully graduating from high school. On average, students who earn a 2.0 GPA or less in their freshman year have significantly lower graduation rates than students who earn a 2.5 or higher (on a 4-point scale). Therefore, *students with a GPA of 2.0 or less at the end of their first year of high school should be considered at risk for dropping out.*

✔ **On-track Indicator.** A student is considered on track or off track based on a combination of course failures in core academic courses and credits earned. Simply by scanning course failures and credits earned—early in the first year of high school—schools can highly predict information about who is likely to drop out. This approach, known as the on-track indicator, is described below.

HOW TO CALCULATE THE ON-TRACK INDICATOR

Students who fail one or more core courses OR accumulate fewer credits than the number required for promotion to 10th grade are considered off track for graduation.

For example, in Chicago Public Schools, the number of credits required for promotion to 10th grade is **five**.* Table 1 shows how course failures and credit accumulation combine to identify individual students as on track or off track.

Table 1. New Freshman On- and Off-Track Indicators		
Number of Semesters With Fs in Core Courses	**Number of Credits Accumulated Freshman Year**	
	Less Than 5.0	**5.0 or More**
2 or more semesters	Off track	Off track
0 or 1 semester	Off track	On track

In short, during their freshman year, students must have no more than one semester F and no fewer than the number of credits required to be promoted to 10th grade. Since the total number of credits or Carnegie units required for promotion varies among schools and districts, each high school or district must identify the appropriate credit-accumulation benchmark. *Students identified as off track at the end of their first year of high school should be considered at risk for dropping out of high school and should be targeted for intervention.*

Note that the definition of "on track" really represents the minimum expected level of performance. Students are not automatically off track if they fail one semester-long core academic course or if they have not completed exactly one-quarter of the credits required for graduation by the end of their first year of high school. Later grades offer some, but not much, time to catch up.

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* In Chicago Public Schools, the total number of credits required for high school graduation is **24**. The required number of credits for promotion from grade 9 to grade 10, therefore, is equal to one-fourth of the total number of credits required for graduation, minus 1.

ISSUE BRIEF

ISSUE BRIEF

SUMMARY OF "HIGH-YIELD" INDICATORS

The indicators described above are highlighted because previous research has shown that they are strong early warning signs displayed in the first year of high school that predict whether students will graduate or drop out. Table 2 is a summary of the indicators and the benchmarks that suggest students are at risk.

Table 2. Summary of "High-Yield" Indicators			
Type of Information	Indicator	Brief Description	Benchmark (Red Flag)
Attendance	Absenteeism rate	Number of days absent during the first 20 days and each quarter of the first year of high school	The equivalent of more than 10% of instructional time missed during the first year indicates student may be at risk.
Course Performance	Course failures	Number of Fs in any semester-long course during the first year of high school	Even one failed course indicates student may be at risk.
	Grade point average (GPA)	GPA for each semester and cumulative GPA	GPA under 2.0 indicates student may be at risk.
	On-track indicator	Combination of the number of Fs in **core** academic courses and credits earned during the first year of high school	Two or more Fs in core academic courses *and/or* fewer than one-fourth of the credits required to graduate minus one indicate that student is off track to graduate.

BUILDING YOUR EARLY WARNING SYSTEM

The National High School Center has developed guidance for developing early warning systems for the purpose of keeping more students in school and engaged in learning rather than dropping out. This hands-on tool was developed for high schools and districts. Recommendations for ways the state can support such a system are also offered.

The National High School Center has created a template in MS Excel that is designed to make it easy for schools to enter the relevant information for their first-year students. The tool, available at http://www.betterhighschools.org/docs/EWStool.xls from the National High School Center, automatically calculates the indicators for attendance, course failures, GPA, and on-track status and provides a report that lists each student and whether the student is below the defined benchmark on each of the indicators.

The main elements of the tool are illustrated below.

Student Data Entry Screen (Semester 1):

Student Information				Semester One Student Data						
Last Name	First Name	Student ID	Grade	20 Day Count	Days Absent Quarter 1	Days Absent Quarter 2	No. Courses Failed (All)	No. Courses Failed (Core)	No. Credits Earned	GPA
Example Student 1		1234	9	6	7	4	0	0	3	3.90
Example Student 2		5678	9	0	5	15	2	2	2.5	1.80
Example Student 3		9512	9	0	1	0	0	0	3	4.00
Example Student 4		7532	9	1	2	3	2	0	3	3.10
Example Student 5		6541	9	5	6	12	3	1	1.5	2.10
			9							
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			9							

Student Report Screen (Semester 1 and Full Year):

Student Information				Semester Indicators of Risk					Full Year Indicators of Risk			
Last Name	First Name	Student ID	Grade	Flag for 20 Day Count Attendance	Flag for Q1 Attendance	Flag for S1 Attendance	Flag for Course Fs	Flag for GPA	Flag for Attendance	Flag for Course Fs	Flag for GPA	Flag for "Off-Track"
Example Student 1		1234	9	Yes	Yes	Yes	No	No	Yes	No	No	On-Track
Example Student 2		5678	9	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Off-Track
Example Student 3		9512	9	No	No	No	No	No	No	No	No	On-Track
Example Student 4		7532	9	No	No	No	Yes	No	No	Yes	No	On-Track
Example Student 5		6541	9	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Off-Track
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ISSUE BRIEF

ISSUE BRIEF

Many schools already have data systems that capture some or all of the information that can be used for an early warning system. It is important to note that, to the extent possible, any early warning system should be integrated with the school's data system already in use. The intent of the National High School Center tool is to provide a template that could be aligned with the data collection systems already in place, either by importing data from the school's main system into the tool or by integrating the functions of the tool into the school's main system.

USING YOUR EARLY WARNING SYSTEM TO TARGET INTERVENTIONS

Identifying students at risk of dropping out by using an early warning system is only the first step in addressing the dropout challenge. Studying the indicators made readily available by the early warning system can help school officials target students in need with appropriate interventions. The next step is to identify and provide effective and appropriate dropout-prevention strategies.

Tracking multiple indicators is integral to successful early warning systems. There will be cases in which students are flagged as at risk based on one indicator (e.g., they fail one or more courses) but not the others (e.g., their overall GPA is higher than 2.5 or their attendance patterns are not of concern). In these cases, it is likely these students are struggling with particular subjects or areas (e.g., literacy), and specific academic interventions may be most appropriate.

In cases where the early warning signs all converge and indicate a general disengagement with school, the provision of comprehensive dropout-prevention programs that aim to get students re-engaged in school activities and academics may be needed. However, it is important to emphasize that dropout-prevention programs that are disconnected from the core instructional program of a school are unlikely to be a good use of resources (Allensworth & Easton, 2007).

See the National High School Center's research brief, *Approaches to Dropout Prevention: Heeding Early Warning Signs with Appropriate Interventions* (Kennelly & Monrad, 2007) (http://www.betterhighschools.org/docs/NHSC_ ApproachestoDropoutPrevention.pdf), for a review of the best available research on effective dropout-prevention strategies.

USING THE EARLY WARNING SYSTEM TO MONITOR PROGRESS

Once students have been identified as "at risk," the indicators in the early warning system can continue to be used to follow the progress of students who are participating in dropout-prevention interventions. Different strategies of varying intensity can then be applied, depending on whether students respond positively to interventions or not. Some students may move back on track toward graduation in response to school-wide approaches designed to engage students in activities, while other students may need more intensive one-on-one interventions that involve regular monitoring and interaction with adults. For more information about tiered intervention approaches at the high school level, see Duffy (2007) at http://www.betterhighschools.org/docs/NHSC_RTIBrief_08-02-07.pdf.

Overall, the most useful and flexible early warning system includes accurate information on attendance and academic performance and also includes up-to-date information on the programs provided to individual students. This information will allow school staff to target specifically appropriate interventions to students who need them and to monitor their progress in response to those interventions.

DEVELOPING AN EARLY WARNING SYSTEM AT THE DISTRICT LEVEL

The research from several large districts (i.e., Chicago; Philadelphia; and Fall River, Massachusetts) provides valuable information about risk factors associated with dropping out of high school. This guide focuses on using those risk factors to develop simple early warning systems at the school level. However, it is important to note that local context matters, and it is possible that the pathways to dropping out do vary in some school systems. School districts are

uniquely positioned to initiate the development of strong early warning systems by starting with a retrospective, longitudinal analysis of their own students' dropout and graduation patterns. Districts interested in developing early warning systems should explore the factors (e.g., academic performance, engagement, or social and individual characteristics) that are most strongly associated with whether past students graduated successfully or dropped out. With this information in hand, school systems can move forward and implement data systems that accurately predict which *current* and *future* students are at the highest risk. This can improve the efficiency and effectiveness of identifying students at risk and targeting dropout-prevention interventions.

District-level early warning systems should be coordinated with school-level early warning systems to maintain information on individual students and schools over time. In general, the database must include unique student identifiers to track students by grade level and across schools, as well as enrollment information, demographics, achievement information, transcript information, attendance, behavior grades or discipline information, and graduation and dropout information.

Jerald (2006) outlines a set of steps and considerations to take when building an early warning system at the district level. The first, critical step is to build a database or data warehouse that can be used for a longitudinal analysis to explore the factors best associated with dropout in the district.

Although this guide focuses primarily on developing school-level early warning systems for students while they are in high school, research suggests that some students exhibit early warning signs in middle school and, in some cases, even before. Because the district has the unique ability to coordinate information from multiple schools, a district database can track students from earlier than high school. The transition year to middle school (sixth grade in many districts) is a good starting point for identifying the local risk factors most predictive of whether students graduate or drop out.

Table 3 summarizes the indicators for grades 6–9, as identified in research studies conducted in the Philadelphia Public Schools and the Fall River, Massachusetts, Public Schools (Balfanz & Herzog, 2005; Neild & Balfanz, 2006; Neild & Farley, 2004; Neild, Stoner-Eby, & Furstenburg, 2001; Roderick, 1993).

Table 3. Examples of Highly Predictive Risk Factors for Dropping Out of High School, From District Cohort Studies		
Type of Risk Factor	**Philadelphia**	**Fall River, Massachusetts**
Academic performance	• Earning an F in English or math during grade 6 or 8 • Failing courses and falling behind in credits in grade 9 • Failing to earn a promotion from grade 9 to grade 10	• Very low grades or attendance in grade 4 • Significant decline in grades from grade 5 to grade 6 • Significant decline in GPA from grade 8 to grade 9 • Being retained in any grade during grades K–8 or in high school
Educational engagement	• Low attendance (80% or lower) during grade 6, 8, or 9 • Receiving a failing mark for classroom behavior during grade 6	• Significant drop in attendance beginning in grade 6

Note. Adapted from Jerald (2006).

ISSUE BRIEF

Effective use of elementary and middle school-level indicators includes (a) identifying students at risk for dropping out of high school before they even enter high school, and then (b) targeting transition-assistance services and interventions and dropout-prevention measures at the start of those students' high school careers.

To build the database, the district should pick a group of students to follow through their high school careers with an end point that is at least 1 year after that group should have graduated. For example, students who were in grade 6 in the 1999–2000 academic year should have graduated high school in spring 2006. Individual student and school characteristics for this group would be tracked from fall 1999 through spring 2007.

To the extent possible, student characteristics should include **demographics** (e.g., socioeconomic status, race/ethnicity, gender, mobility, years over typical age for grade, and special education and English Language Learner status), information about **academic performance** (e.g., grades in core academic subjects; scores on standardized assessments; number of high school credits attempted and earned by semester and year; GPA by semester, year, and cumulatively; on-time promotion from grade 9 to grade 10; scores on standardized assessments, end-of-course exams, and exit exams), and **educational engagement** factors (e.g., attendance, discipline indicators such as number of office and counseling referrals and suspensions). The database should include at least two groups or cohorts of students (Jerald, 2006).

Districts can work with local researchers and/or technical assistance providers to develop a flexible electronic database of this information.

Exploring Sample Datasets

Once the database is built, districts and their partners should embark on an investigation of their past and recent dropouts. The goal is to identify the "highest yield" indicators in the district. For individual risk factors or combinations of factors, ask these four questions:

1. What percentage of students *with* each risk factor (or combination) dropped out?
2. What percentage of students *with* each risk factor (or combination) graduated in 4 (or 5) years?
3. What percentage of students *without* each risk factor (or combination) dropped out?
4. What percentage of students *without* each risk factor (or combination) graduated in 4 (or 5) years?

Questions 1 and 4 represent the accuracy or predictive validity of the risk factors. These high-yield indicators are those that predict which students will drop out.

Question 2 represents the "false negatives," and Question 3 represents the "false positives." The "high-yield" indicators for the district are those with as few of these as possible.

The results of these exploratory analyses of the "high-yield" indicators in the district should drive the creation of the district's early warning system. That is, not all of the student and school characteristics included in the exploratory dataset need to be incorporated into the early warning system—the effectiveness of the early warning system depends on the ease of data collection at the school level, and extraneous (i.e., non-"high yield") information should not be included.

Once the key characteristics most appropriate for the local context are revealed by the exploratory analyses, the district can play a key role in facilitating and developing early warning systems by:

- Creating data collection systems that allow schools to easily collect key early warning data;

- Monitoring the use of data to identify students at risk of dropping out at the school level;

- Supporting continuous data analysis at the school level, across schools, and district wide;

- Training school-level staff on data collection and analysis;

- Targeting district funding and resources to support (a) schools in identifying students early, (b) intervention strategies for at-risk students, and (c) collaboration among high schools across the district or region;

- Developing strategies to refine and improve continuously the predictive power of indicators in the local context; and

- Including the on-track indicator, or a local adaptation of it, as an accountability measure for schools in the district (e.g., as done in Chicago Public Schools) (Allensworth & Easton, 2005).

A coordinated early warning system at the district level allows the district's administrators to target resources to schools that are most in need because they serve the highest proportion of students at risk of failing to graduate. Because No Child Left Behind (NCLB) holds schools and districts accountable for high school graduation rates, an early warning system gives district officials information that they can use to be proactive and prevent a negative impact on the status of Adequate Yearly Progress (AYP) for their high schools.

It is also important to note that it is more efficient to incorporate the early warning system with the district accountability database which has, as recommended by the National Governors Association Compact and the Data Quality Campaign, unique student identifiers and individual student-level test score data and demographics. Separate databases that are not interrelated are far less powerful than integrated data systems.

Gathering information about the effectiveness of dropout prevention programs and strategies is of critical importance for making a real dent in the dropout problem. Information about the dropout prevention programs provided to students should also be included in each school and district early warning system (e.g., the database can include a field for "prevention program" to include the name of the program that each student is provided). This allows school and district personnel to gauge the observed success of different interventions in their own local context. In any given location, some programs may be associated with improved retention and graduation rates, while other programs are not. Maintaining accurate and up-to-date data about the programs in which students participate can generate actionable information about the most effective strategies for keeping students in school—information that will directly benefit the entire district as well as other, similar districts around the country.

Early warning systems allow schools to capture the actual scope of the dropout challenge one student at a time. School, district, and state leaders need to exert the political will to stand by transparent, accessible, accurate, and usable data systems designed to address meaningful approaches to dropout prevention. Students who are flagged early and tracked closely may stay in school with the right support.

ISSUE BRIEF

THE ROLE OF THE STATE IN SUPPORTING EARLY WARNING SYSTEMS

Fifteen percent of U.S. high schools produce 50% of the country's dropouts (Balfanz & Legters, 2004), and every state in the nation has some high schools with very low graduation rates. As of 2004, only six states had the majority of their high schools showing graduation rates of 90% or higher (Balfanz & Legters, 2004). Placing emphasis on the creation of early warning systems, and following through with strategic allocation of resources based on empirical data, can help states meet their graduation targets. Developing a school-, district- and state-level early warning system contributes to a consistency in vision, goals, and resources that are targeted toward monitoring students throughout the system.

States can play a particularly significant role by helping to build and align the data systems necessary to track and prevent dropouts. States are well positioned to do so, since they are already mandated to collect and report data on a number of important indicators related to NCLB, as well as the Individuals with Disabilities Education Improvement Act of 2004 (IDEA). The development of a state-wide early warning system must be integrated with other state efforts to improve data systems that track individual students over time. The time is right to incorporate high-yield indicators that are based on available data into comprehensive and coherent databases.

States can support and require districts to monitor their high school students in the context of an early warning system. Recognizing that the calculation of aggregated rates of on-track students may vary at the school and district levels, states can:

- Use aggregate on-track rates or a promoting power index (Balfanz & Legters, 2004) to identify high schools and districts with high proportions of students at risk of dropping out—also known as "dropout factories" to:

  (a) Prioritize allocation of resources—to high schools and districts with the most severe problems; and

  (b) Support the implementation of dropout prevention strategies and other interventions with evidence of effectiveness.

PROMOTING POWER INDEX AND DROPOUT FACTORIES

Definition of "Promoting Power"
The Promoting Power Index is a measure of the number of grade 12 graduates compared to the number of students enrolled 4 years earlier in grade 9 (Balfanz and Legters, 2004).

"Dropout Factories"
High schools where the freshman class shrinks by more than 40% by the time students reach their senior year are considered "dropout factories," a phrase originally coined by Balfanz and Legters in their groundbreaking work on the dropout problem.

Researchers at the Johns Hopkins University have applied the Promoting Power Index uniformly and identified dropout factories across the nation.

An interactive map that details the state statistics can be found at: http://www.msnbc.msn.com/id/21532193.

ISSUE BRIEF

- Create state-level data systems that allow the incorporation of local data.

  (a) States should use state-wide unique student identifiers to support tracking of students across grade levels, schools, and districts throughout the state. Initiatives such as the Data Quality Campaign are currently underway to help states build integrated, longitudinal data systems with unique state-wide student identifiers that allow student-level data to be linked across databases and across years. (For more information, see http://www.dataqualitycampaign.org.)

  (b) Provide professional development for district and school staff to conduct their own data analysis, identify context-specific early warning signs, and use the data to the fullest extent.

- Monitor the early warning data to validate the allocation of state-level funds to target districts and schools in need.

CONCLUSIONS

The information in this guide is intended to support educators at all levels of the public school system to build data systems and approaches that identify probable high school dropouts before they leave school. Because local contexts are unique, districts and states should work with experienced technical assistance providers to tailor systems that use the best possible indicators available to enable the widest application.

This guide to developing an early warning system is only a first step to truly addressing the problem of high school dropouts and the difficulties students face as they transition into and navigate through high school. Next steps include identifying the characteristics and needs of individual students who are in danger of dropping out and implementing programs that support students as they move toward graduation.

ACKNOWLEDGMENTS

END NOTES

[1] Individual schools and districts will want to develop early warning systems that reflect their unique contexts and needs. For example, some schools use the trimester, while others divide the calendar according to semesters. Furthermore, some of the indicators themselves must reflect local settings above and beyond the basic core academic course grades and number of credits accumulated, as described later in this guide.

[2] Many schools that operate on semester schedules have quarterly report cards or even earlier failure warning notices. This notification would be a good source of data for schools looking identify students who may be in trouble early in their first year of high school.

[3] In some schools, students receive a weighted GPA that gives extra points for honors courses, thus putting GPAs on a 5-point instead of a 4-point scale. If the early warning system is to be coordinated across high schools at the district level, schools and districts should consider using "unweighted" GPAs, because schools within districts often have varying access to honors, AP, and International Baccalaureate courses (Allensworth & Easton, 2007).

ISSUE BRIEF

ISSUE BRIEF

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