



What's Known

January 2015

A practitioner's guide to implementing early warning systems

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Summary

A well implemented early warning system can help educators and others identify students at risk of dropping out and assign and monitor interventions to keep them on track for graduation. This guide describes and provides examples of early warning system implementation strategies in use across the country.

REL 2015–056

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January 2015

This report was prepared for the Institute of Education Sciences (IES) under Contract ED-IES-12-C-0003 by Regional Educational Laboratory Northwest administered by Education Northwest. The content of the publication does not necessarily reflect the views or policies of IES or the U.S. Department of Education nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. Government.

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Frazelle, S. & Nagel, A. (2015). *A practitioner's guide to implementing early warning systems* (REL 2015–056). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Northwest. Retrieved from <http://ies.ed.gov/ncee/edlabs>.

This report is available on the Regional Educational Laboratory website at <http://ies.ed.gov/ncee/edlabs>.

Summary

Every 26 seconds in the United States, a teenager drops out of school. This dire statistic, from a report by America's Promise Alliance (Swanson, 2008), captured national attention and directed research and resources to tackling the nation's dropout epidemic. Five years later, high school graduation outcomes continue to cause concern, and "large 'graduation gaps' remain in many states among students of different races, ethnicities, family incomes, disability, and limited English proficiencies" (Balfanz, Bridgeland, Bruce, & Fox, 2013, p. 1).

Many middle and high school principals express concern over students who unexpectedly begin to struggle and appear to fall off track without apparent reason. These educators want tools to help them identify these students as early as possible. Other school leaders believe they can tell, early in a student's academic career, whether the student is at serious risk of not graduating. For these school leaders, the problem is not identifying the students who are struggling; it is figuring out how to get these students into meaningful interventions while accommodating districts' financial and time constraints.

A well implemented early warning system can help school leaders address these challenges. Early warning systems are used by states and districts across the nation to identify off-track students in middle and high school and to design and assess interventions to keep them on track to graduate (see Allensworth & Easton, 2007; George Washington University, 2012; Therriault, Heppen, O'Cummings, Fryer, & Johnson, 2010; Therriault, O'Cummings, Heppen, Yerhot, & Scala, 2013).

Despite the popularity of early warning systems, research on their implementation is sparse. Most of the research has focused on developing and validating early indicators (Allensworth & Easton, 2007; Balfanz, Herzog, & Mac Iver, 2007; Balfanz, Wang, & Byrnes, 2010; Brown University, 2012; Gurantz & Borsato, 2012; Uekawa, Merola, Fernandez, & Porowski, 2010; University of Chicago Consortium on Chicago School Research, 2007a,b,c). Organizations that have worked extensively in this area (such as the American Institutes for Research, the University of Chicago Consortium on Chicago School Research, and the Everyone Graduates Center) have focused on creating early warning system tools and producing reports on promising practices (Bruce, Bridgeland, Fox, & Balfanz, 2011; Johns Hopkins University, 2012; Nagaoka, 2013; Therriault et al., 2013).

This guide summarizes what is known about early warning system implementation and describes how states, districts, and schools can draw on the research to inform their work locally.

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Why this guide?

This guide describes the core ideas, recommendations, and experiences of districts and schools implementing early warning systems and provides examples of practices in use across the country.¹ The guide focuses on a key challenge identified in the literature: how to most productively access, interpret, and use early warning data.

The guide discusses the following five core components of early warning system implementation:

- Establishing and training a team to use the early warning system.
- Identifying accurate indicators.
- Designing and using reports.
- Mapping appropriate interventions to individual student needs.
- Evaluating student progress and intervention effectiveness.

This guide is designed for state-, district-, or school-level practitioners who have some familiarity with early warning systems but want to learn more about their implementation. It may also help early warning system developers create systems that respond to practitioners' needs and guide district- and school-level teams in implementing early warning systems more effectively.² Box 1 briefly explains early warning systems and the challenges associated with them.

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Box 1. Early warning systems: Arming districts and schools with data that can make a difference

Early warning systems use individual student data to generate indicators of on-track status for graduation, including attendance, behavior, and course performance (for more information, see box 3 on the ABCs later in this report). When a student falls below the on-track threshold, a team of school staff assigns the student to an intervention designed to help the student improve his or her performance. By systematically examining data, early warning systems can empower districts and schools to:

- Identify struggling students earlier in their school career.
- Direct students to appropriate interventions.
- Examine and address on-track patterns among groups of students regularly.

There are two major challenges to early warning systems: creating the system and helping staff members use it routinely.

First, from a technical perspective, indicators must be valid and identify unique leverage points for intervention. While this may seem obvious, indicators and thresholds are often adopted without verifying their predictive power in their local context. Many districts do not have the resources to rigorously test the validity of each indicator, but most can at least examine previous years of student data for indicator trends relating to student performance and graduation outcomes. For a more detailed explanation, see the section “Ensuring local validity and threshold checking” in this guide.

Second, from a practical perspective, indicator systems are not likely to produce the desired improvements in student outcomes unless they are part of a regular cycle of data use by teachers and principals (Therriault et al., 2013).

Implementing an effective early warning system requires training and supporting local practitioners to use multiple types of data to understand student progress and difficulties. Such training and support should highlight how practitioners can apply their findings to programs and strategies to improve graduation outcomes and college readiness and success.

Establishing and training a team to use the early warning system

Implementing early warning systems effectively requires careful attention to team roles and responsibilities. Team structure, composition, leadership, goals, and community support should be determined in accord with district and school needs.

Developing the team

Before districts and schools begin to use an early warning system, they must establish a dedicated team of staff who will work together to identify off-track students, assign interventions, and monitor progress. Typically, the teams are formed at the district or school level, depending on the number of students they serve.

The Sioux Falls School District in South Dakota provides an example of a team convened solely at the district level. This team “include[s] four teachers, two school counselors, a school social worker, three elementary principals, two middle school principals, four curriculum services and special services administrators, and two instructional support services administrators” (Hauser & Koenig, 2011, p. 71).

The Houston (Texas) Independent School District’s Dropout Recovery, Intervention, and Prevention Committees are teams convened at the school level, relatively independent of the district. On these teams, school faculty and staff, such as counselors and administrators, coordinate efforts with other community members, including police officers: “Every middle and high school has a Dropout Recovery, Intervention, and Prevention Committee made up of assistant principals, teachers, college access coordinators, clerks, police officers, and counselors that meet weekly to monitor each student’s attendance and academic performance and to create and monitor ‘personal graduation plans’ for students who are identified as off track” (Houston Independent School District, 2012, p. 5).

Another option is a mixed-level team, in which district- and school-level teams collaborate on responsibilities. The National High School Center suggests this approach, with school teams meeting more frequently than the district team.³ The center recommends that district team members attend school-level team meetings and that a representative from each school team participate in the district-level team meetings. The center also recommends including representation from each partner middle school outside the district that transitions students into the district’s high schools. Participation of all stakeholders who will interact with the early warning system encourages proper feedback cycles and can help early warning system teams coordinate and communicate more effectively (Therriault et al., 2013).

Regardless of a team’s composition, it is imperative to establish good communication among all stakeholders, including district- and school-level leaders, administrative staff, counselors, teachers, information technology specialists, evaluation and assessment personnel (where available), students, parents, and community partner organizations. Open communication about the early warning system’s purpose and use can help mitigate anxiety.

Before districts and schools begin to use an early warning system, they must establish a dedicated team to identify off-track students, assign interventions, and monitor progress

Assigning roles and responsibilities

Building an early warning system team usually starts with appointing a team leader who will facilitate meetings, check on data entry and updates, and oversee progress monitoring for individual students and intervention programs. Many early warning system teams also include data coaches who teach users how to access and interpret the data. A data coach from outside the school may serve as the team leader if external funding or partners are involved. The team leader can also be someone from within the school who has a strong understanding of the data and their potential use. It is helpful to include other key staff members and stakeholders (table 1).

Defining goals and objectives

Early warning system teams focus on reducing dropouts and increasing graduation rates. However, team members may view the team’s specific mission differently when they first meet. An initial goal-setting process can ensure that all members understand the team mission and help establish a road map for how the team will accomplish its goals. The S.M.A.R.T. framework can help the team design actionable, realistic objectives and timeframes (box 2) (Kekahio & Baker, 2013).

The S.M.A.R.T. goal framework can help the early warning system team design actionable, realistic objectives and timeframes

Table 1. Common early warning system positions and responsibilities

Position	Responsibility
Information technology staff	Inputs data, collaborates on report structures, builds reports, updates data
School team leader	Serves as a liaison for the school with other schools and the district, ensures compliance with overall mission
District-level leader	Disseminates accomplishments and challenges, advocates for policy change at the district level
Program coordinator	Keeps track of the mapping between indicators and interventions available
School counselor	Represents the students' voice, relays what is working on a day-to-day basis
Data coach	Teaches the team how to interpret the data, identifies appropriate professional development
Representatives from different stakeholder groups (for example, content-area teachers, special education and English language learner teachers, equity coordinators, social workers, and members of parent/student organizations)	Serve as advisors and provide insight into how the system is working for a variety of stakeholders (some systems employ members on a rotating basis)

Source: Authors’ summary.

Box 2. Creating S.M.A.R.T. goals

- S—Is the goal **specific**? (What will it do? Who will carry it out?)
- M—Is the goal **measurable**? (How will the team know it has been achieved?)
- A—Is the goal **achievable**?
- R—Is the goal **relevant** to performance expectations?
- T—Is the goal **time bound**? (How often will this task be done? By when will this goal be accomplished?)

Source: Kekahio & Baker, 2013.

Determining meeting content and structures

While school-level team meetings might periodically include discussions of aggregated indicator and intervention data, these meetings typically focus on individual students. Johns Hopkins University School of Education, Center for Social Organization of Schools (2012) provides extensive guidance on structuring the meetings of early warning system teams. A meeting may begin with a few minutes of announcements, include a brief discussion of students with time-sensitive issues (for example, pregnancy, major behavior violations), and then focus on students flagged as off track. The team would spend time discussing individual students (typically 5–10 minutes for each student). For new students this could include a debrief on the student's specific challenges and flagged indicators; a discussion of staff members and interventions that could best help the student; and the assignment of a staff person, intervention, and follow-up date for tracking the student's progress. For students previously flagged, the discussion could include a debrief on any changes in student status, an update on the student's progress in the assigned interventions, and a discussion of next steps based on what seems to be working and what still needs attention.

In a mixed-level team, meetings are more likely to include discussion about each school's trends and an overview of interventions provided throughout the district. After the team collects and evaluates student progress and specific interventions, the district can review the interventions and schools that are progressing most effectively.

It is up to the early warning system team to determine the frequency of meetings that is most appropriate for the district or school it oversees. In some cases, such as within the Houston Independent School District, school teams meet weekly to create intervention plans and discuss student progress (Houston Independent School District, 2012). School teams in the Big Brothers Big Sisters of Eastern Missouri, ABC Today! program also meet weekly. In addition, they convene monthly meetings with school principals and quarterly meetings with district leaders to update administrators and involve them in reviewing student data, trends, and outcomes (Bruce et al., 2011).

By contrast, the school transformation facilitator in the Diplomas Now program “facilitates biweekly early warning system meetings in which teams of teachers who share common groups of students and other student support staff members work together to interpret the data and design and plan effective interventions” (Herzog, Davis, & Legters, 2012, p. 4). The frequency of meetings should align with the school's specific needs and structure (depending, for example, on the most commonly triggered indicators and the frequency of data updates). Even when there are no new data to discuss, team members may meet to review the status of student interventions or determine whether more training is required.

Providing professional development for using the system

Early warning system implementation frequently includes professional development for teachers, administrators, and other school staff in accessing the data and appropriately interpreting its meaning. Professional development can also help generate excitement around using the early warning system, shifting views from the system as “yet another task” to complete.

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The Sioux Falls School District early warning system committee established a list of action initiatives to teach staff how to interpret early warning system results (Hauser & Koenig, 2011, p. 71). The action initiatives include activities such as:

- Training student assistance teams in a response-to-intervention model that uses universal, targeted, and individualized interventions in a tiered approach.
- Training staff members to recognize risk factor subgroups and related triggers for intervention.

Professional development can also be organized by the data coach. For example, Metro Nashville Public Schools used Race to the Top funding to employ an early warning system coordinator to oversee the districtwide program and 12 data coaches, one for each school cluster. The data coaches went to the schools “to build a culture among teachers and counselors for understanding student-, classroom-, and school-level early warning system data, and [for using the data] to guide intervention efforts” (Bruce et al., 2011, p. 28).

Similarly, the Alabama State Department of Education provides 25 state-trained data coaches who are deployed to schools identified as “high-need” by the state’s accountability system (Bruce et al., 2011). The state also conducts professional development sessions on coaching students for graduation. Staff apply tools they learn in the sessions to guide their early warning system efforts.

Early warning system teams can bolster their staff and financial resources by partnering with community organizations

Seeking support through community volunteers

Districts and schools often report feeling overwhelmed by the staff and financial resources needed to effectively implement an early warning system (Herzog et al., 2012). Teams can bolster their resources by partnering with community organizations. In the ABC Today! Program, Big Brothers Big Sisters of Eastern Missouri provided a “director of impact,” who was placed in five schools in the St. Louis Public Schools district to facilitate meetings and lead the early warning system team (Bruce et al., 2011). The program’s success inspired Wells Fargo Advisors to contribute financial and technical resources to build a data transfer system that increased the organization’s capacity to identify and intervene for students who were off track.⁴

The Diplomas Now program partners with the organization Communities in Schools, which provides a school transformation facilitator to help schools with their early warning system implementation (Herzog et al., 2012). This full-time position compiles data and facilitates biweekly early warning system meetings. Diplomas Now also partners with City Year, which provides AmeriCorps members to serve as full-time tutors, mentors, and role models for students identified through the early warning system.

Identifying accurate indicators

The primary function of an early warning system is to alert school community members (educators, parents, and students) when a student falls off track. System indicators should therefore include the strongest predictors of high school graduation. The number of indicators a district or school uses will frequently vary, but researchers advise that picking too many can create an overwhelming amount of data to analyze and interpret (University of Chicago Consortium on Chicago School Research, 2014),

Choosing indicators

According to the University of Chicago Consortium on Chicago School Research (2014), effective indicators are:

- Valid for the intended purpose.
- Actionable by schools.
- Meaningful and easily understood.
- Aligned with district and school priorities.

Consortium researchers advise early warning system teams to carefully question whether each of their proposed indicators meets these criteria. According to the consortium, student characteristics outside the school's control, such as family income, special education status, and new student status, should not be used as indicators, despite research showing strong correlations between these variables and on-time graduation.

Focusing attention on a small set of indicators allows early warning system teams to allocate their time and effort more efficiently

Focusing attention on a small set of indicators allows early warning system teams to allocate their time and effort more efficiently. Many districts use some combination of attendance, behavior incidents, and course performance as a starting point for their dropout indicators (box 3). Early warning system teams can establish a base set of indicators first and then add other indicators. Over time, teams can assess whether the additional indicators substantially increase the number of students identified as off track. Unhelpful indicators can be dropped. Remember that each new indicator requires changing report formats, analyzing more data, and designing additional interventions to help the student improve in the indicator area.

Although researchers at the Everyone Graduates Center and the National High School Center do not recommend using state assessment scores as an indicator, state-level early warning systems tend to include them because they correlate strongly with on-time

Box 3. The ABCs

The literature recommends that districts start with the ABCs as their base set of indicators. The ABCs stand for:

- **A—Attendance.** Research has long shown a strong relationship between how often a student misses school and his or her probability of graduating in four years. Most students who do not regularly attend class fall behind in their coursework and consequently see their grades suffer. Poor attendance can also indicate that a student is struggling with health, family, or other issues that are distracting them from their studies.
- **B—Behavior incidents.** As few as one suspension in grade 6 may predict whether a student graduates in four years (Balfanz et al., 2007). Behavior incidents can indicate that a student is disengaged with the school environment. Suspensions often cause an additional burden on students to catch up on the material they missed.
- **C—Course performance.** Number of course failures and overall grade point average obviously correlate with a student's probability of graduating in four years. If a student fails a course, he or she will need to make up the credit outside the regularly scheduled school time to stay on track. Poor course performance can also indicate disengagement at the classroom level.

Note: For more information on each indicator (as cited) see Allensworth and Easton (2007) (A,C); Balfanz et al. (2007) (A,B,C); Balfanz et al. (2010) (A,B,C); Celio (2009a,b) (A,B,C); Mac Iver (2010) (A,B,C); Mac Iver and Mac Iver (2009) (A,B,C); Roderick (1993) (A,C); Uekawa et al. (2010) (A,C).

Table 2. Massachusetts academic goals by grade level

Risk model age group	Grade level	Expected student outcome for each grade group
Early elementary	Grades 1–3	Proficient or advanced on grade 3 Massachusetts Comprehensive Assessment System English language arts assessment (English state test scores)
Late elementary	Grades 4–6	Proficient or advanced on grade 6 Massachusetts Comprehensive Assessment System English language arts assessment and math assessment (English and math state test scores)
Middle grades	Grades 7–9	Passing grades on all grade 9 courses
High school	Grades 10–12	High school graduation

Source: Summary based on information from Massachusetts Department of Elementary & Secondary Education (2013a).

graduation. Early warning system teams should consider the purpose of their system when deciding whether to include state or other assessment scores. If the system is designed to monitor student progress at more regular intervals, these scores may be less appropriate.

Systems that include elementary grade reporting, however, may want to use state assessment scores to set on-track goals for younger children since labeling elementary students as potential dropouts may be considered premature. Massachusetts, for example, has identified unique academic goals for each grade level, which are then used to determine whether a student is on track to graduate (table 2).

Ensuring local validity and threshold checking

The literature advises early warning system teams to set thresholds for indicators using local data wherever possible. Indicators can have degrees of reliability that vary by context and the precise definition a district or school uses for a given measure. For example, some schools may consider a student absent if he or she misses one class period. Others may have more lenient policies that do not count an absence until the student misses more than half a school day.

Teams can set threshold levels by beginning with recommendations from national organizations that have extensive experience with early warning systems such as the National High School Center and Johns Hopkins University. The National High School Center suggests thresholds to create a two-tiered system for identifying students as on or off track for graduation (table 3). John Hopkins University provides suggestions for establishing

The literature advises early warning system teams to set thresholds for indicators using local data wherever possible

Table 3. National High School Center’s suggested early warning system indicators and thresholds

Indicator	Threshold
Attendance	Student missed 10 percent or more of instructional time (absences)
Behavior	Locally validated thresholds (for example, referrals, in- or out-of-school suspension, behavior grades)
Course performance	Failure in one or more courses Earned 2.0 or lower grade point average (on a 4-point scale)

Source: Therriault et al., 2013, p. 2.

Table 4. Johns Hopkins University’s suggested early warning system indicators and thresholds

Threshold	Attendance (days missed)		Behavior				Academics	
	Quarter	Full year	Office referrals		Suspensions		Math and English language arts ^a	Core courses ^b
			Quarter	Full year	Quarter	Full year		
Off track	9 days	36 days	2	6	1	2	Report card grade of F	Report card grade of F
Sliding	5–8 days	19–35 days	1	3–5	0	0–1	Report card grade of D	Report card grade of D
On track to graduation	4 days or fewer	18 days	0	0–2	0	0–1	Report card grade of A, B, or C	Report card grade of A, B, or C

a. Middle school.

b. High school.

Source: Johns Hopkins University, 2012, p. 10.

thresholds using a three-tiered system to identify students as off track, sliding, or on track to graduation (table 4). Teams can then experiment with their historical data to see whether changing thresholds may make sense in their context.

Early warning system teams can determine the accuracy of thresholds by examining historical data on the number of students who dropped out in the past three to five years who would have been identified through the system.⁵ For example, if the team decided that two days of unexcused absences would serve as an indicator that a student is at risk but then found that the majority of such students actually graduated, the team might want to increase the number of unexcused absences to four and re-examine the data. Likewise, if many students who dropped out are not identified at four unexcused absences, the team might want to decrease the number to three. Teams can re-examine the accuracy of their indicators and thresholds each year as they acquire new data, since thresholds are likely to change. For example, if a team achieves positive results from targeting attendance, over time the team will most likely need to set higher expectations for student attendance. Research suggests that the best thresholds flag a substantial number of students who can be helped through interventions, without overwhelming the capacity of the early warning system team to respond (Balfanz et al., 2010; Hauser & Koenig, 2011).⁶

Once thresholds for each indicator are finalized, the team can begin placing students into categories (for example, “on track,” “sliding,” and “off track”)

Once thresholds for each indicator are finalized, the team can begin placing students into one of three categories: “on track” (no perceived issues), “sliding” (at least one indicator shows that the student may be struggling), and “off track” (at least one indicator shows that the student, on his or her current trajectory, is at high risk of not graduating in four years). The categories can help the team direct students to appropriate interventions based on the intensity of assistance the student may require.

Designing and using reports

An early warning system focuses on two primary actions: compiling data that identify student progress toward graduation and alerting staff when the data indicate that a student is falling off track. Developing usable reports for district and school staff is therefore a crucial part of early warning system implementation.

Making reports simple but effective

Early warning system teams should collaborate closely with their information technology departments (where available) to develop an easy-to-use reporting structure.⁷ Teams should consider the different audiences they are targeting and the need for various reporting formats. School summary reports may be most helpful for administrators, while classroom-level reports may provide more insight for teachers. Student-level reports may be useful for teachers and counselors who work with individual students. These reports could also be disseminated to the students and their families.

For example, the University of Chicago Consortium on Chicago School Research (2007a,b,c) has created a series of “What Matters” briefs, targeted specifically to freshman students, parents, and teachers. These two-page flyers include charts to demonstrate how students’ grades and attendance can affect their chances of graduating from high school. They further explain the importance of establishing good habits to keep from falling off track. The flyers encourage students, parents, and teachers to share responsibility for helping the student graduate on time. Districts or schools implementing early warning systems could create a similar set of personalized briefs for students and families to illustrate how the student’s performance compares with district and school averages and with early warning system thresholds.

Regularly updating indicator data will ensure that the early warning system team can accurately monitor and track student progress

Establishing a process for routinely creating and using reports

The early warning system teams should update their indicator data regularly to reflect current student data. Regular updates will ensure that the early warning system team can identify students who have recently fallen off track, recognize gains for students who have improved, and reassess intervention strategies for students who were previously flagged and assigned to interventions but remain off track. The team may discuss all students at each meeting or, if the number of off-track students is too large for the team to discuss in the time available, the team can divide students into smaller subsets assigned to different team members. If the second option is chosen, the team should still debrief as a group on actions taken and useful strategies. Team meetings will focus on using the reports to monitor and track student progress.

The frequency of early warning system reporting updates will depend on data availability, which can vary across indicators. Some indicators, such as course grades, may be available for update only at certain intervals. For example, the Houston Independent School District’s Dropout Prevention/Early Warning Report system inputs failing grades from progress reports every three weeks (Logan-Fain, 2011). Updates for other indicators, such as attendance and behavior, may be available more frequently. When considering how often to meet, early warning system teams should work with information technology staff to determine how frequently they can expect to receive new information about students.

The student data needed to create the early warning system reports will contain personally identifiable information, which is covered by privacy laws. In addition to complying with federal laws, such as the Family Educational Rights and Privacy Act and the Health Insurance Portability and Accountability Act, observing student confidentiality is essential for protecting families from potentially embarrassing disclosures, discrimination, differential treatment, and threats to family and job security. Early warning system teams should consult with legal counsel about ensuring confidentiality for early warning system data and reporting.

Mapping appropriate interventions to individual student needs

The fourth core component in successfully implementing an early warning system is to align intervention efforts with the chosen indicators. Creating a direct link between indicators and interventions is essential for getting students the individualized assistance they need to improve and, ultimately, graduate.

Surveying what is available

Districts deploy a variety of high school graduation strategies and interventions, ranging from districtwide policies to more individualized student programs (Herzog et al., 2012). Districts, therefore, may find it more productive to first catalogue all the interventions—the programs and policies currently in place to help students succeed in school—before adopting new strategies. For instance, the Louisiana Dropout Early Warning System includes a list of more than 50 interventions to which early warning system teams can assign off-track students (Louisiana Department of Education, 2009). These interventions range from tutoring programs and a homework hotline to home visits or moving the student to an alternative site or school. Additionally, teams can check the What Works Clearinghouse (<http://ies.ed.gov/ncee/wwc/findwhatworks.aspx>) for lists of effective interventions with strong evidence of effectiveness specifically for improving outcomes in behavior, some academic subjects, and, more generally, dropout prevention. The early warning system team may want to openly discuss and document any constraints with intervention programs or policies. Have they found the program to be successful? Is there a limit to the number of students enrolled in the program? Has the policy been difficult to implement? Can the team identify steps to monitor and improve implementation of the program or policy?

Creating a direct link between indicators and interventions is essential for getting students the individualized assistance they need to improve and, ultimately, graduate

Early warning system teams should first consider adjusting the initiatives and interventions they have already invested in. For example, could changing the math curriculum engage more students in math classes? Or could revising district or school attendance policies make a difference? However, teams may also need to implement new programs and policies to effectively intervene for identified students.

Merging response-to-intervention efforts with early warning systems

Districts considering or implementing an early warning system often also use a response-to-intervention model with a tiered approach to supporting student success. This model has three levels of intervention (American Institutes for Research, National Center on Response to Intervention, 2010, p. 4):

- Primary level: Focuses on all students and involves evidence-based “district curriculum and instructional practices that ... align with state or district standards and incorporate differentiated instruction.”
- Secondary level: Focuses on identified at-risk students and provides “targeted, supplemental instruction delivered in small groups.”
- Tertiary level: Focuses on students struggling after receiving primary and secondary interventions and provides “intensive, supplemental instruction delivered individually or to small groups.”⁸

The response-to-intervention model can provide early warning system teams with a useful framework to conceptualize and manage their interventions. Likewise, early warning

Table 5. Comprehensive plan for keeping students on the graduation path

Type of intervention	Focus of intervention		
	Attendance	Behavior	Course performance
Schoolwide (all students)	• Every absence brings a response • Create a culture that says attending every day matters • Positive social incentives for good attendance • Data tracking by teacher teams	• Teach, model, and expect good behavior • Positive social incentives and recognition for good behavior • Advisory • Data tracking by teacher teams	• Research-based instructional programs • In-classroom support to enable active and engaging pedagogies • Data tracking by teacher teams
Targeted (15–20 percent of students)	• Two or more unexcused absences in a month brings brief daily check by an adult • Attendance team (teacher, counselor, administrator, parent) investigates and problem solves (why isn't student attending?)	• Two or more office referrals brings involvement of behavior team • Simple behavior checklist students bring from class to class, checked each day by an adult • Mentor assigned	• Elective extra-help courses—tightly linked to core curriculum—preview upcoming lessons and fill in knowledge gaps • Targeted, reduced class size for students whose failure is rooted in social or emotional issues
Intensive (5–10 percent of students)	• Sustained one-on-one attention and problem solving • Appropriate social service or community support	• In-depth behavioral assessment (why is student misbehaving?) • Behavior contracts with family involvement • Appropriate social service or community supports	• One-on-one tutoring

Source: Mac Iver & Mac Iver, 2009, p. 23.

Teams can easily survey their mapping for potential gaps in intervention availability

systems can provide response-to-intervention models with stronger, more regularly available data for student progress monitoring. Districts using response-to-intervention models might consider combining the efforts of these two initiatives. Mac Iver and Mac Iver (2009) describe how the two frameworks can map together in their comprehensive plan for keeping students on the graduation path (table 5).⁹

Mapping interventions to indicators

The next step is to identify which indicator the intervention can best address. For example, afterschool tutoring may benefit students flagged because of course grades. A peer mediator group may help students with behavioral incidents. A spreadsheet program such as Excel can facilitate mapping by listing interventions as rows and indicators as column variables. A focused intervention is tied directly to a specific indicator; however, such interventions may improve performance on multiple indicators. Creating a structure that accommodates using multiple links can help simplify the process of identifying the programs best suited for flagged students. The sample intervention–indicator mapping shows how this can be done (table 6).

Teams can easily survey their mapping for potential gaps in intervention availability. Where substantial gaps exist, the team may consider asking for additional resources to fund a new program or reallocating current funding from indicator areas where resources

Table 6. Sample intervention–indicator mapping

Intervention	Notes	Focus of intervention (ABCs)		
		Attendance	Behavior	Course performance
Afterschool tutoring	Available only for math			✓
Peer mediators	Accommodates 15 students per grade		✓	
Individual coaching	We have four coaches who can each manage 10 students	✓	✓	✓
First period check-in		✓		
Policy to talk to parents after two unexcused absences	Do we have staff available to personally talk to every parent?	✓		

Source: Authors' summary.

are available. If new funds are not available and existing programs are already spread too thin, the team may consider approaching community or business partners to help close the gap.

Early warning system teams should closely monitor their systems to observe when an intervention is not meeting a student's needs, based on the intervention's level of intensity and the length of time it should take a typical student to improve. For example, if the student attends a daily intervention rather than a monthly support group, the team might expect faster results. Teams can examine a student's indicators for the anticipated change. After a predetermined amount of student participation time, the team can then meet with the student to see how well the intervention is working.

Assigning interventions to students

As noted earlier, when an early warning system team meets, its members will discuss the students who are off track and determine interventions for these students. These interventions should correspond to the flagged indicators and to the individual student's characteristics and needs. For example, in the Sioux Falls School District all students who are flagged as off track are assigned a student engagement case manager (for example, a teacher, counselor, or success coordinator) who interacts with the student daily. Further interventions depend on the indicator. Students who are flagged for the academic indicator are assigned to learning centers or afterschool tutoring for additional study time, while a student flagged for having more than 10 absences is assigned a social worker or counselor advocate who investigates the cause of the student's poor attendance (Hauser & Koenig, 2011).

The early warning system team may investigate a student's needs by talking to the student directly and conferring with the student's family and other school staff (such as teachers, coaches, counselors, and administrators); all may be able to provide insights into why the student is off track. The team can then determine the appropriate interventions and monitor their frequency based on the student's needs and the school context.

Teams are encouraged to consult resources such as the What Works Clearinghouse to identify interventions with strong evidence of effectively improving student outcomes. Teams may also consider partnering with organizations outside their district or school to gain

The early warning system team may investigate a student's needs by talking to the student directly and conferring with the student's family and other school staff to determine appropriate interventions

further insight into why certain students are struggling. Mentorship is used in the Diplomas Now program, which provides near-peer mentors from City Year (a national service program). Diplomas Now also provides “social workers/site coordinators from Communities in Schools ... and a school transformation facilitator ... [to provide] both insight into the challenges students face, and additional person power to help implement and monitor the proposed solutions” (Bruce et al., 2011, p. 32).

Evaluating student progress and intervention effectiveness

To maximize the benefits of an early warning system, districts and schools need to know whether student performance improves after an intervention is put in place and whether they need to adopt new or different strategies to address gaps in student supports. Properly implementing an early warning system and carefully recording student progress by intervention can help teams evaluate how well programs and policies are meeting student needs. Team members can also use these data to investigate whether these trends are consistent across subgroups of students.

Examining student progress

Key student data to track will include, at a minimum, the interventions prescribed for the student. However, to improve the process of examining individual interventions, teams should also collect data on how often the student has participated in each intervention and the student’s performance in the indicators on which he or she was flagged.

Recording these variables will allow the team or case manager to examine the data over time. It is crucial for the early warning system team to review this information to track the student’s progress and modify the intervention plan if the student remains off track. The team should determine how frequently it can expect updates on student progress data, in the same way it receives updates to the early warning system data.

Ideally, the early warning system database will provide fields to collect this information; however, many systems do not incorporate this functionality. The early warning system teams will thus need to record the information themselves, using an Excel spreadsheet or Access database, coordinate the effort with their information technology staff, or use other resources. For example, because the Massachusetts Early Warning Indicator System does not allow for recording interventions internally, the state’s Department of Elementary & Secondary Education suggests that “schools and districts consider using the seven-step process created by the National High School Center to analyze Early Warning Indicator System data, assign student interventions, and review student progress” (Massachusetts Department of Elementary & Secondary Education, 2013b, p. 17).¹⁰

Examining the intervention level

One important reason districts and schools might consider examining their own interventions for student outcome trends is the scarcity of rigorous studies on the effectiveness of early warning system intervention strategies. Even when considering less rigorous evaluations, little information is available on the effectiveness of either interventions or early warning systems as a whole. One factor may be that districts and schools have only recently adopted these systems, so the research community may not have had time to conduct

Properly implementing an early warning system and carefully recording student progress by intervention can help teams evaluate how well programs and policies are meeting student needs

evaluations. Also, until recently, early warning system implementation has not emphasized the careful recording of student progress. Without accurate data on how students respond to interventions, internal or external research partners cannot analyze the impacts of their programs.

To ensure better and more accurate data on interventions, early warning system teams are encouraged to include procedures for recording student progress data in their planning and schedule time to discuss intervention data among their team and with other district and school leaders. Properly recording student progress by intervention can help district and school teams examine trends in how well programs and policies are meeting student needs and what emerging needs may require greater support. Accurate data also enable future researchers to evaluate more rigorously select interventions or programs and thus provide information that can help teams learn from their experience.

During early warning system meetings, for example, the team can monitor and examine trends in student outcomes for each intervention strategy. The Louisiana Dropout Early Warning System documentation states that beyond identifying students and assigning interventions, the system aims to record and track success for developing best practices. This system includes preset reports to encourage this goal. Within a given intervention the system displays a line or bar chart showing the number of students who received the intervention each month. The system also compares across intervention types through a table whose cells display the number of students who triggered a given indicator and were assigned to each intervention (Louisiana Department of Education, 2009).

Although tracking intervention data is no substitute for a rigorous evaluation, early warning system teams can use these data along with individual student reports to see which interventions are useful and determine whether usefulness differs by indicator. Intervention data are frequently examined annually (Therriault et al., 2013), though teams are advised to review their data as needed based on their specific district and school contexts and the expected rate of student improvement.

Early warning system teams can use intervention data along with individual student reports to see which interventions are useful

Implications of this guide

This guide summarizes what is currently known about early warning system implementation and aims to help those who are actively working to implement these systems in their states, districts, and schools. Research continually suggests that early warning systems will not succeed merely by providing data (Johns Hopkins University, 2012, p. 30; Therriault et al., 2013, pp. 6–9). Districts and schools that report the most progress with their early warning systems have paid careful attention to system-level implementation, actively endorsing and supporting their early warning systems across all levels of leadership and providing professional development to all system users. Much forethought has also gone into the roles each team member will play and the data they will collect and record. Early warning systems should not be used alone, but as part of a framework to incorporate data use into decisionmaking. And early warning systems can be expanded to cover other grade levels or college and career readiness (box 4).

Teams can adapt indicators and thresholds to their local contexts and carefully align interventions to create a comprehensive net to catch students who might otherwise have been overlooked. However, even accurate thresholds will not identify every student at risk

Box 4. Other early warning system applications

While early warning systems are most prevalent in high schools, some systems cover middle school grades or earlier. FHI 360's Indicators for Success: Interventions and Supports program (http://middlestart.org/network/group/early_indicators/, retrieved April 25, 2013), implemented in the New York City Department of Education, focuses on early warning system use in middle schools. The process outlined in this guide could easily be adapted for a middle school framework.

The Minneapolis School District hopes to expand its program to address student needs as early as elementary school. "Minneapolis is analyzing the dropout data from its class of 2010 to identify early warning signs of those students all the way back to grade 3, in an effort to implement Check and Connect interventions at earlier grades" (Sparks, 2011, p. 8). Going this far back could prove useful, though it is beyond the scope of most early warning systems.

Some programs have expanded their early warning systems to include measures for determining progress toward college and career readiness. For example, Brown University's Annenberg Institute for School Reform and Stanford University's John W. Gardner Center have partnered to launch the College Readiness Indicator Systems initiative. Together they have worked with school districts in Dallas, New York City, Philadelphia, Pittsburgh, and San Jose to develop and implement expanded early warning systems. Beyond the usual tracking of attendance, behavior, and course performance, these systems monitor academic preparedness, academic tenacity, and college knowledge (Gurantz & Borsato, 2012).

New Visions for Public Schools has partnered with College Readiness Indicator Systems in New York City to expand the traditional early warning system approach. In addition to looking at point-in-time "stocks" of students who are "off track," "almost on track," "on track to graduation," and "on track to college," New Visions maps out "flows" of students as they move up or down between these categories (Brown University, 2012). School administrators use this "flow map" to examine how students are doing, either within a cohort year or schoolwide. They then use these data to identify school structures or interventions that may be helping some students improve but inadvertently drawing resources away from other students and putting them at risk of dropping to a lower category. By identifying such feedback loops, New Visions strongly encourages administrators to see how the school functions as a system and make course corrections to prevent helping one group of students at the expense of another.

of not graduating. An early warning system used in conjunction with other dropout prevention and school improvement strategies (for example, response-to-intervention models) will identify and support the greatest number of students at risk. By planning carefully and incorporating resources from the outset of early warning system adoption, districts and schools can more accurately identify potential dropouts and help keep these students on track for graduating with their peers.

Notes

1. All suggestions provided in this guide are drawn from articles listed in the references. Key references are specifically identified in the guide summary. New citations are added if an idea, or quote, was specific to only one article or author.
2. For a shorter summary of the information provided in this guide, see Frazelle and Barton (2013).
3. The National High School Center's seven year grant from the U.S. Department of Education's Office of Elementary and Secondary Education and Office of Special Education Programs ended on March 31, 2013. Its website and resources remain available indefinitely to users through support from the American Institutes for Research, but content and external links have not been updated since then.
4. Another example is the StriveTogether model being used in Cincinnati (see <http://www.strivetogether.org>).
5. For more specific recommendations from national organizations that have worked extensively with early warning systems and methods for setting indicator thresholds, see Balfanz et al. (2010, p. 5) and Hauser & Koenig (2011, pp. 25–42).
6. One way to manage this process can be through using a response-to-intervention framework (see section “Merging response-to-intervention efforts with early warning systems” later in this guide).
7. For example, reports from FHI 360's Indicators for Success: Interventions and Supports program represent the on-track, sliding, and off-track categories through color coding (green, yellow, and red, respectively) to help practitioners identify students more easily.
8. For more details and references on response-to-intervention implementation, see McNerney and Elledge (2013).
9. Additional examples can be found in Bruce et al. (2011, pp. 20–23).
10. For more information on this process, see http://www.betterhighschools.org/EWS_imp.asp.

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Making Connections

Studies of correlational relationships



Making an Impact

Studies of cause and effect



What's Happening

Descriptions of policies, programs, implementation status, or data trends



What's Known

Summaries of previous research



Stated Briefly

Summaries of research findings for specific audiences



Applied Research Methods

Research methods for educational settings



Tools

Help for planning, gathering, analyzing, or reporting data or research