

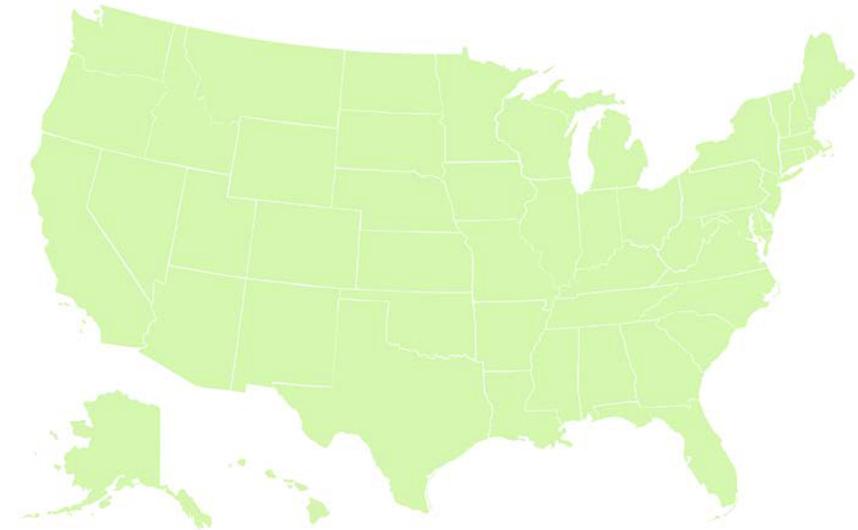
Forum Guide to Early Warning Systems

National Forum on Education Statistics

Mission: To plan, recommend, and develop education data resources that will support local, state, and national efforts to improve public and private education throughout the United States.

Members

- Representatives of offices of the U.S. Department of Education and other federal agencies
- Representatives of state and local education agencies (SEAs and LEAs)
- Associate members from U.S. territories, Regional Educational Laboratories (RELs), and national education associations



Working Group Motivation

- At the summer 2017 Forum meeting, the Forum's National Education Statistics Agenda Committee (NESAC) discussed early warning systems as part of a broader discussion on school climate and student engagement.
- The Forum convened the Early Warning Systems Data Working Group based on NESAC's discussion.
- The Working Group determined that a Forum resource could assist SEAs and LEAs who are interested in using an early warning system to help identify and provide interventions to students who are at risk of dropping out of school.

Purpose and Audience

- **Purpose:** To help state and local education agencies plan, develop, implement, and use an early warning system in their agency.
- **Audience:** Staff in education agencies who are considering implementing or have already implemented an early warning system. This audience includes program and data staff, administrators, policymakers, and anyone else involved in planning, developing, implementing, or using an early warning system at the school, district, or state level.

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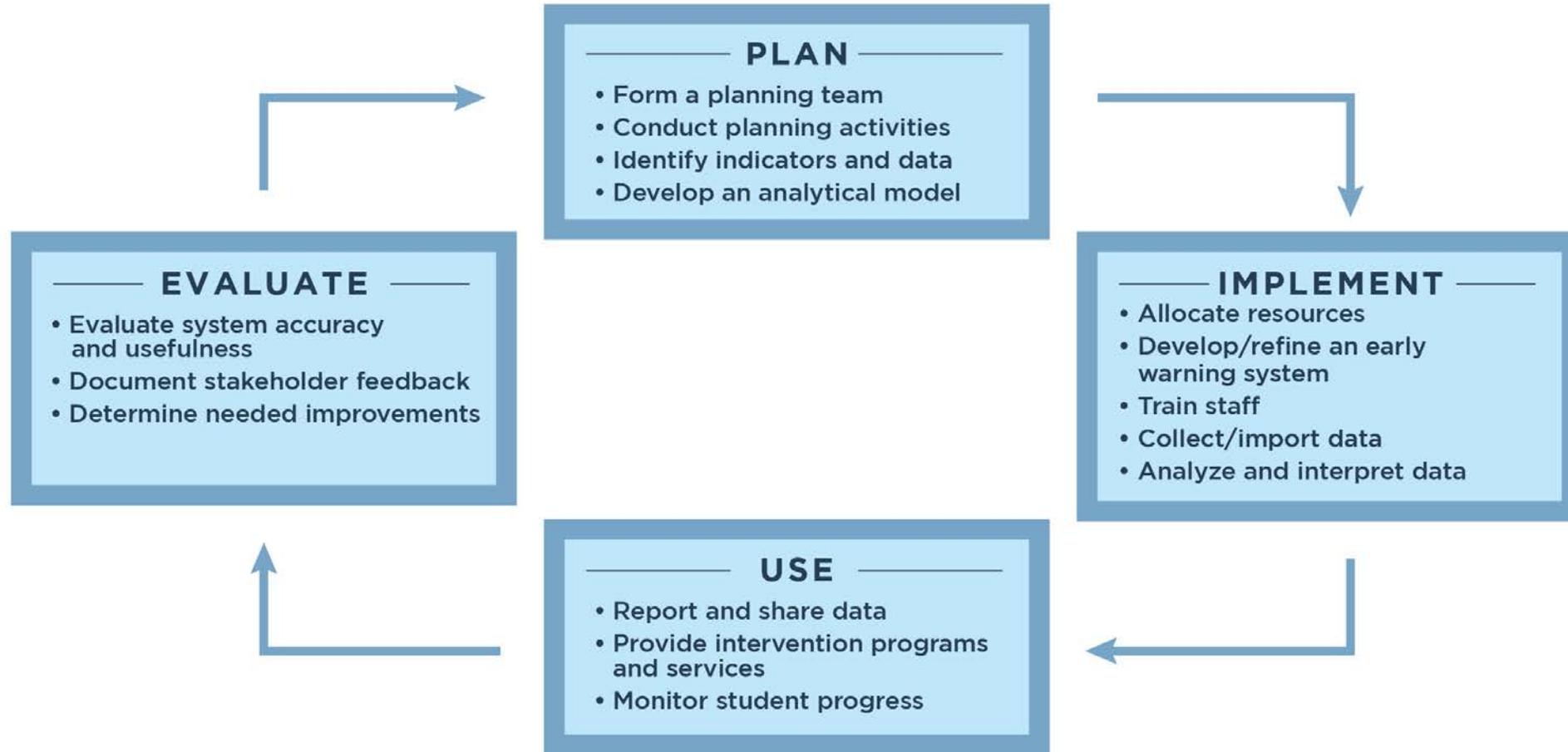
Chapter 1: Introduction to Early Warning Systems

- Defines early warning systems
- Reviews their use in education agencies
- Explains how to adopt an effective early warning system planning process

What Is an Early Warning System?

An early warning system identifies students who are at risk of dropping out of school. This type of system applies predictive analytics to student data to determine student risk level in relation to predefined indicators and thresholds. Risk factors traditionally include attendance, behavior, and course performance, and may include other factors such as exhibited behaviors or academic performance. By identifying students who are at-risk, an early warning system provides targeted data that may be used to develop student interventions that are designed to avoid negative student outcomes.

Early Warning System Planning Process



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Chapter 2: Early Warning System Indicators, Data, and Analytics

- Reviews the role of indicators and quality data in early warning systems
- Summarizes techniques for analyzing early warning data
- Previews trends and innovations in early warning systems, indicators, data, and analytical models

Early Warning Indicators and Data

- Early warning indicators measure the extent to which a student is likely to be at risk of dropping out of school.
- The effectiveness of an early warning system is contingent on the quality of the data. Quality data are accurate, secure, useful, and timely.

Common Early Warning Indicators
Assessment performance
Attendance
Behavior
Course performance
Mobility
Progression

Early Warning System Analytics

- The goal of an early warning system analytical model is to maximize the number of students correctly identified as at-risk while minimizing the number of students incorrectly identified, either as at-risk or not at-risk.
- Different techniques are used to analyze early warning data. Analytical models may determine student risk through analysis of each indicator independently, or as part of a multivariate analysis.

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Chapter 3: Effective Practices in Early Warning Systems Development, Implementation, and Use

- Recommends best practices in developing, implementing, and using early warning systems

Effective Practices in Early Warning Systems Development, Implementation, and Use

- Maximize organizational resources
- Support technical development and implementation
- Develop and provide staff training
- Report and share timely data
- Use data to inform student interventions
- Evaluate system effectiveness

Using Early Warning Data

SEA LEADERSHIP

- Monitor statewide dropout rate
- Inform planning and policy decisions
- Provide training and support services to LEAs

CENTRAL OFFICE ADMINISTRATION

- Monitor district dropout rate
- Support districtwide data use
- Implement districtwide intervention programs

SCHOOL ADMINISTRATION

- Monitor school dropout rate
- Support schoolwide data use
- Implement schoolwide intervention programs

DATA MANAGEMENT

- Compile, analyze, and report data
- Assess data quality

FINANCE AND BUDGET

- Calculate return on investment
- Allocate funds to program

RESEARCH AND ASSESSMENT

- Monitor trends in student risk
- Evaluate system predictiveness

SCHOOL BOARD

- Refine policies
- Inform budget allocations and funding decisions

STUDENT SERVICES

- Identify students in need of behavior intervention
- Provide targeted intervention services

CURRICULUM AND INSTRUCTION

- Identify students in need of academic intervention
- Provide academic support services

TEACHERS

- Identify at-risk students
- Refer students to targeted intervention services

COMMUNITY PARTNERS

- Support in-school interventions with out-of-school programs and services

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Chapter 4: Case Studies from State and Local Education Agencies

- Highlights seven case studies from three SEAs and four LEAs who have implemented, or are in the process of implementing, an early warning system
- Each case study includes the following:
 - Overarching descriptive information about the agency
 - Description of the system planning, development, and implementation process
 - Review of system indicators, data elements, analytical approach, and data quality practices
 - Discussion of system and data use, including the development and implementation of student interventions
 - Lessons learned

Case Studies From SEAs

- **Delaware Department of Education:** Implementing a statewide system created through collaboration with the Ed-Fi Alliance
- **Montana Office of Public Instruction:** Developing and supporting LEA use of a voluntary statewide system to identify and provide interventions to students who exhibit risk of dropout
- **Wisconsin Department of Public Instruction:** Creating and supporting LEA use of a voluntary statewide system that predicts whether students in grades 6-9 are at risk of not graduating from high school within four years

Case Studies From LEAs

- **Fairbanks North Star Borough School District, AK:** Creating and using a locally validated, custom designed system that assigns each K-12 student a dropout risk level
- **Appoquinimink School District, DE:** Validating early warning indicators at the local level
- **Bozeman School District #7, MT:** Using the Montana Office of Public Instruction's voluntary statewide system to support student interventions in the district's middle schools and high school
- **Metro Nashville Public Schools, TN:** Creating and using a locally validated, research-based system as part of a districtwide commitment to education data use

Lessons Learned From Case Studies

Planning

- Secure broad support from staff and leaders across the agency.
- Draw on professional learning communities and the experiences of colleagues.
- Involve individuals from diverse professional backgrounds in planning teams.
- Prepare for the system to evolve as agency changes occur.

Lessons Learned From Case Studies

Implementation

- Collaborate with trusted partners.
- Pilot-test the system and solicit feedback.
- Consider in-house system development and maintenance.
- Develop a communication plan.
- Provide professional development.
- Share information about the system prior to implementation.
- Think of implementation as an ongoing process.

Lessons Learned From Case Studies

Indicators, Data, and Analytics

- Budget a sufficient amount of time to develop the analytical model.
- Balance analytical model complexity and transparency.
- Verify data and analytical model accuracy prior to implementation.
- Explain to users the capabilities, limitations, and accuracy of the analytical model and its predictive abilities.

Lessons Learned From Case Studies

System Use

- Promote data inquiry and continuous improvement planning.
- Provide training and create resources to encourage use.
- Identify ongoing opportunities to leverage data.
- Use early warning data to inform discussions, actions, and interventions.
- Have an early warning system champion in place.
- Establish an early warning system team, prioritize team meetings, and develop responsibilities for each team member.
- Integrate system use with intervention provision, assignment, and monitoring.
- Offer customized interventions that work best for students and schools.
- Align community provided out-of-school interventions with agency priorities.
- Celebrate student success.

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Appendix A: Checklist of Early Warning System Tasks and Activities

System Planning Tasks and Activities

- ✓ Form a planning team
- ✓ Conduct planning activities
- ✓ Identify indicators and data
- ✓ Develop an analytical model

System Implementation Tasks and Activities

- ✓ Allocate resources
- ✓ Develop an early warning system
- ✓ Train staff
- ✓ Collect/import data
- ✓ Analyze and interpret data

System Use Tasks and Activities

- ✓ Report and share data
- ✓ Provide intervention programs and services
- ✓ Monitor student progress

System Evaluation Tasks and Activities

- ✓ Evaluate system accuracy and usefulness
- ✓ Document stakeholder feedback
- ✓ Determine needed improvements

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Appendix B: Select List of Early Warning Indicators and Data Elements

- Lists early warning indicator topics, student-level indicators, and related data elements

Key Takeaways

- Early warning systems enable schools, districts, and states to make informed decisions and direct resources and services to students who are in need of intervention.
- By identifying students who are at risk of dropping out of schools, early warning systems provide SEAs and LEAs with actionable information that can guide the development and provision of targeted interventions to reduce dropout risk and promote student progression, achievement, and graduation.

Early Warning Systems Data Working Group

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