

From Start to Finish: Using an Early Warning Indicators Approach to Identify Dropouts as Early as First Grade



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Acknowledgements

- Montgomery County Public Schools (MD)
 - Stephanie Williams (*Director, Department of Policy, Records, and Reporting*)
 - Dr. Kecia Addison-Scott (*Supervisor, Applied Research Unit*)
 - Juan Cardenas (*Office of Shared Accountability*)
 - Marilyn Powell (*Applied Research Unit*)
 - Shihching Liu (*Applied Research Unit*)
- Howard County Public Schools (MD)
 - Dr. Vasuki Rethinam (*Coordinator of Research*)
- Baltimore County Public Schools (MD)
 - Kelly Shields (*Strategic Data Project Fellow*)
- Johns Hopkins University's *Everyone Graduates Center*

Main Points

- At least 75% of dropouts can be identified as early as the first grade
- Dropping out of high school is an in- and out-of-school process that begins before middle and high school
- Targeted support through collaboration (e.g., Teacher Teaming); Early Warning Indicators are a platform for interventions, not the solution

Outline of the Presentation

- History of Early Warning Indicators
- The ABCs (Attendance, Behavior, Course Performance) and Student Engagement
- Identifying the Dropouts (Class of 2011 & 2012)
- Displaying Data: The Monitoring Tool
- Limitations (Implementation, Implementation, Implementation)
- Future Thoughts

History of Early Warning Indicators

- Can we identify the students who drop out of high school before they drop out?
- If we identify the students who may drop out, can we prevent them from dropping out?

History of Early Warning Indicators (Continued)

- Chicago, IL (Allensworth & Easton 2005, 2007)
- Philadelphia, PA (Nield & Balfanz, 2006)
- Baltimore, MD (Mc Iver, 2011)
- Boston, MA (Balfanz & Boccanfuso, 2008a)
- Indianapolis, IN (Balfanz & Boccanfuso, 2008b)
- Tennessee (Balfanz, Wang, & Byrnes, 2010)
- Colorado (Mac Iver, Balfanz, & Byrnes, 2009)

The ABCs and Student Engagement

- Proxy measures of student engagement
- Attendance (class absences vs. daily attendance)
- Behavior (in- and out-of-school suspensions)
- Course Performance (math and English grades vs. grade point averages)

The ABCs and Student Engagement (Continued)

- Grade 6 Early Warning Indicators typically include:
 - Attendance below 90%
 - One or more suspensions or serious disciplinary incidents
 - Failing a mathematics and/or English course
- Grade 9 Early Warning Indicators typically include:
 - Attendance below 85%
 - Two or more suspensions or serious disciplinary incidents
 - Failing a mathematics and/or English course (Balfanz & Byrnes, 2010)

Identifying the Dropouts

- Class of 2011
 - 7.4% (833 out of 11,241 students) dropped out of high school

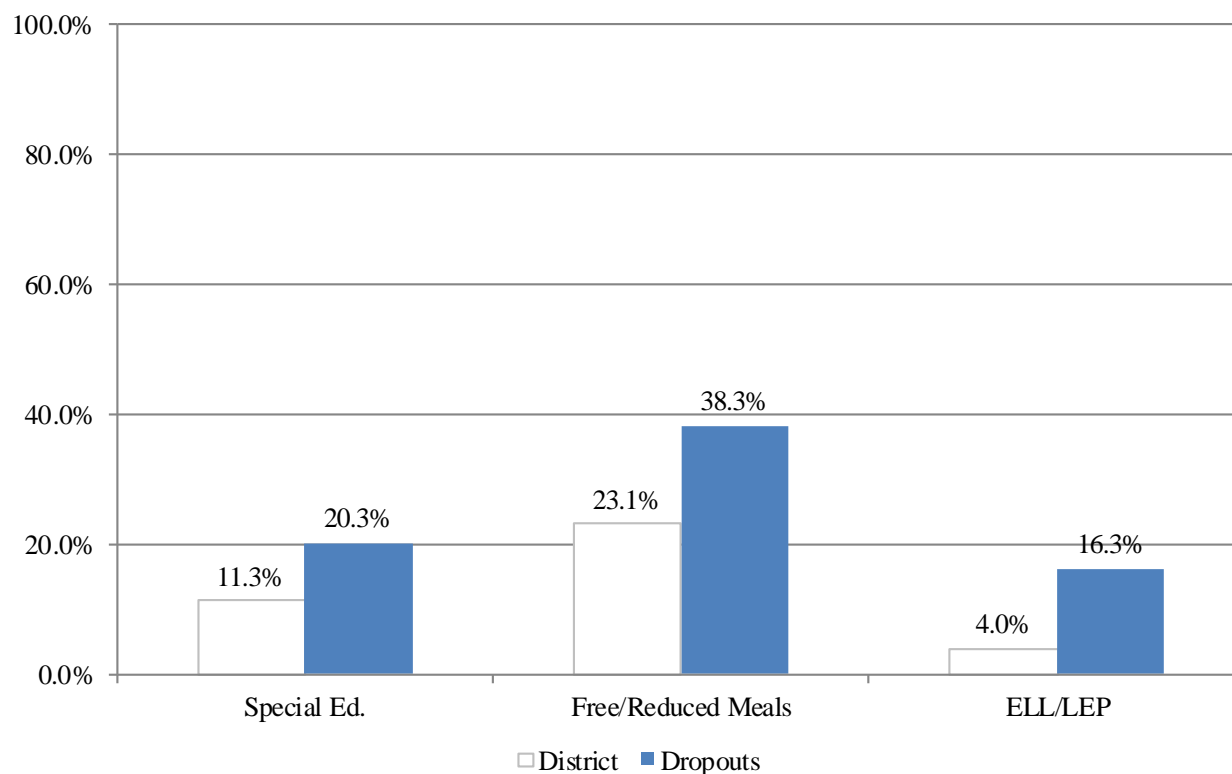
Identifying the Dropouts (Continued)





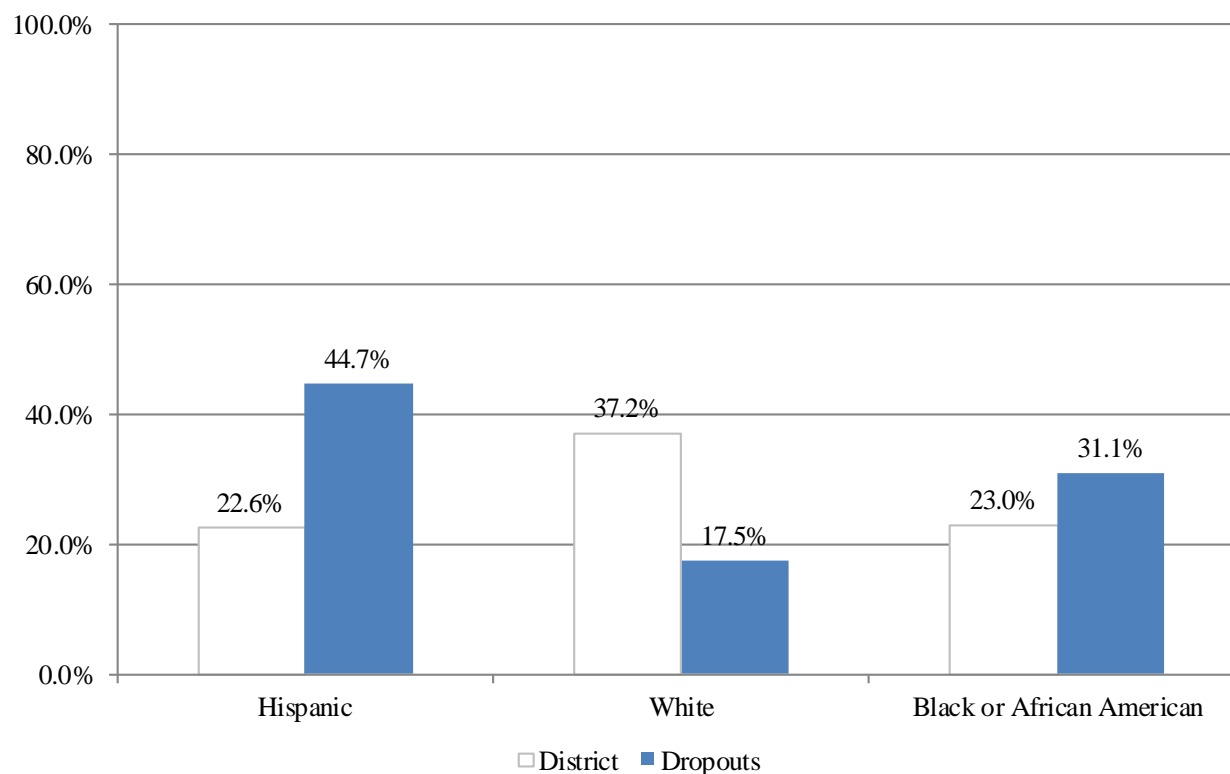
Identifying the Dropouts (Continued)

Figure 1. Percentage of Class of 2011 by special service: dropouts vs. all students.



Identifying the Dropouts (Continued)

Figure 2. Percentage of Class of 2011 by race/ethnicity subgroup: dropouts vs. all students.



Identifying the Dropouts (Continued)

- Research Questions

1. What are the attendance, behavior, and coursework patterns at the end of marking period three for Grade 1, and at the end of marking period one for Grades 3, 6, and 9 students who eventually drop out of high school?
2. For each of the time points, what is the likelihood of students dropping out by each early warning indicator?
3. Are the early warning indicators for identifying the MCPS high school Class of 2011 dropouts reliable at identifying the Class of 2012 dropouts?

Identifying Dropouts (Continued)

Table 1. Number and Percentage of the Class of 2011 Cohort Enrolled in MCPS by School Year and On-Time Grade Level (N = 11,063)

School year (On-time grade level)	Total number of Class of 2011 cohort students enrolled in MCPS	Total number of Class of 2011 cohort dropouts enrolled in MCPS	Percent of Class of 2011 cohort students enrolled in MCPS (N = 11,063)	Percent of Class of 2011 cohort dropouts enrolled in MCPS (N = 723)
1998–1999 (Kindergarten)	6,063	295	54.8	40.8
1999–2000 (Grade 1)	6,785	322	61.3	44.5
2000–2001 (Grade 2)	7,186	343	65.0	47.4
2001–2002 (Grade 3)	7,513	353	67.9	48.8
2002–2003 (Grade 4)	7,833	377	70.8	52.1
2003–2004 (Grade 5)	8,178	407	73.9	56.3
2004–2005 (Grade 6)	8,249	392	74.6	54.2
2005–2006 (Grade 7)	8,711	445	78.7	61.5
2006–2007 (Grade 8)	8,983	470	81.2	65.0
2007–2008 (Grade 9)	9,583	584	86.6	80.8
2008–2009 (Grade 10)	10,439	641	94.4	88.7
2009–2010 (Grade 11)	10,743	566	97.1	78.3
2010–2011 (Grade 12)	10,633	415	96.1	57.4
2010–2011 (Grade 12+1yr)	859	183	7.8	25.3

Identifying the Dropouts (Continued)

- Research Question #1
 - What are the attendance, behavior, and coursework patterns at the end of marking period three for Grade 1, and at the end of marking period one for Grades 3, 6, and 9 students who eventually drop out of high school?

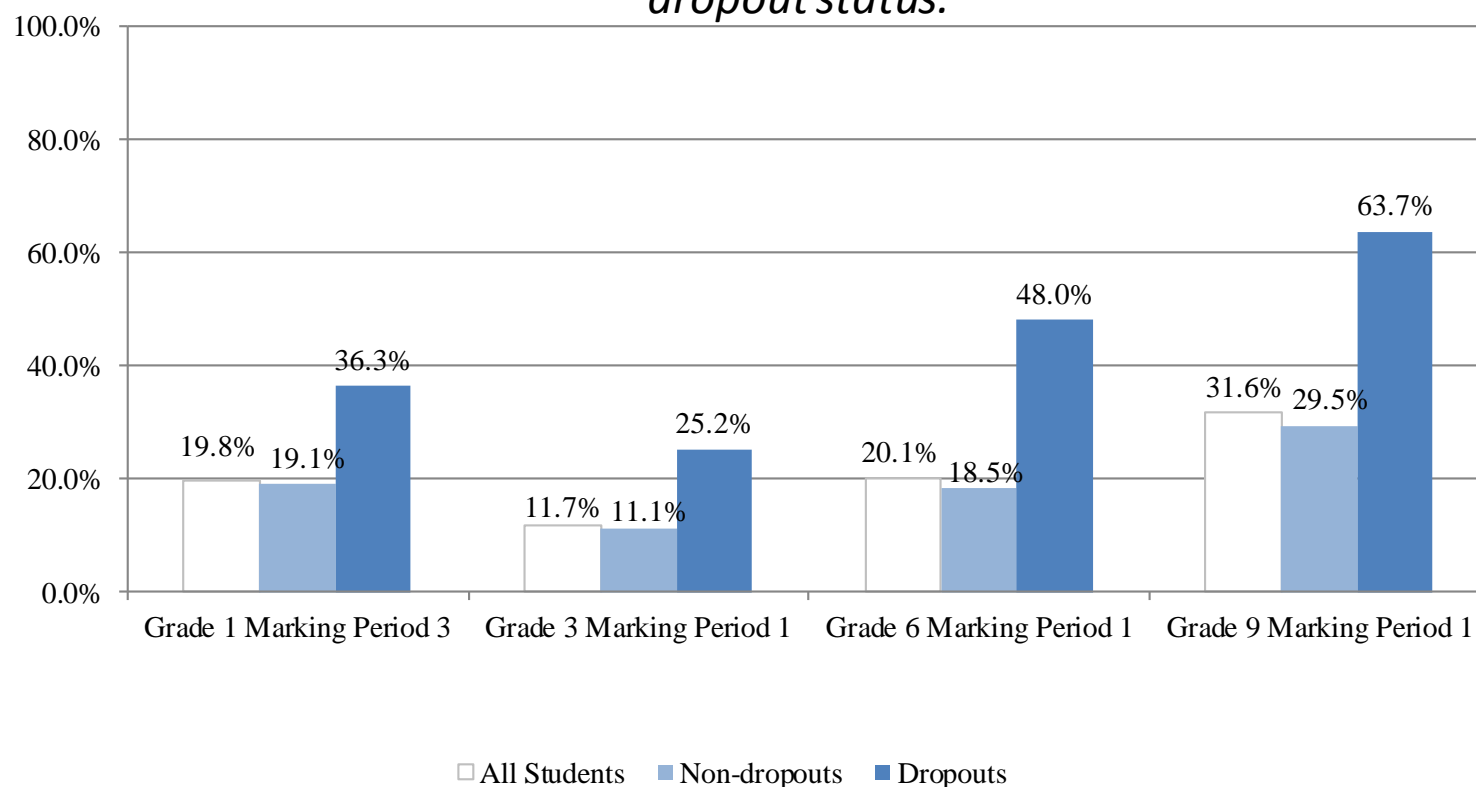
Identifying the Dropouts (Continued)

- Attendance

- For MCPS attending school less than 90% of the time for a given school year equates to being absent from school for nearly 20 days (or 5 days per marking period)
- Across Grades 1, 3, 6, and 9, Class of 2011 dropouts attended school less than 94% of time (or 3 days per marking period)

Identifying the Dropouts (Continued)

Figure 3. Percentage of Class of 2011 with an attendance indicator (missing 3 or more days) by grade, marking period, and eventual dropout status.



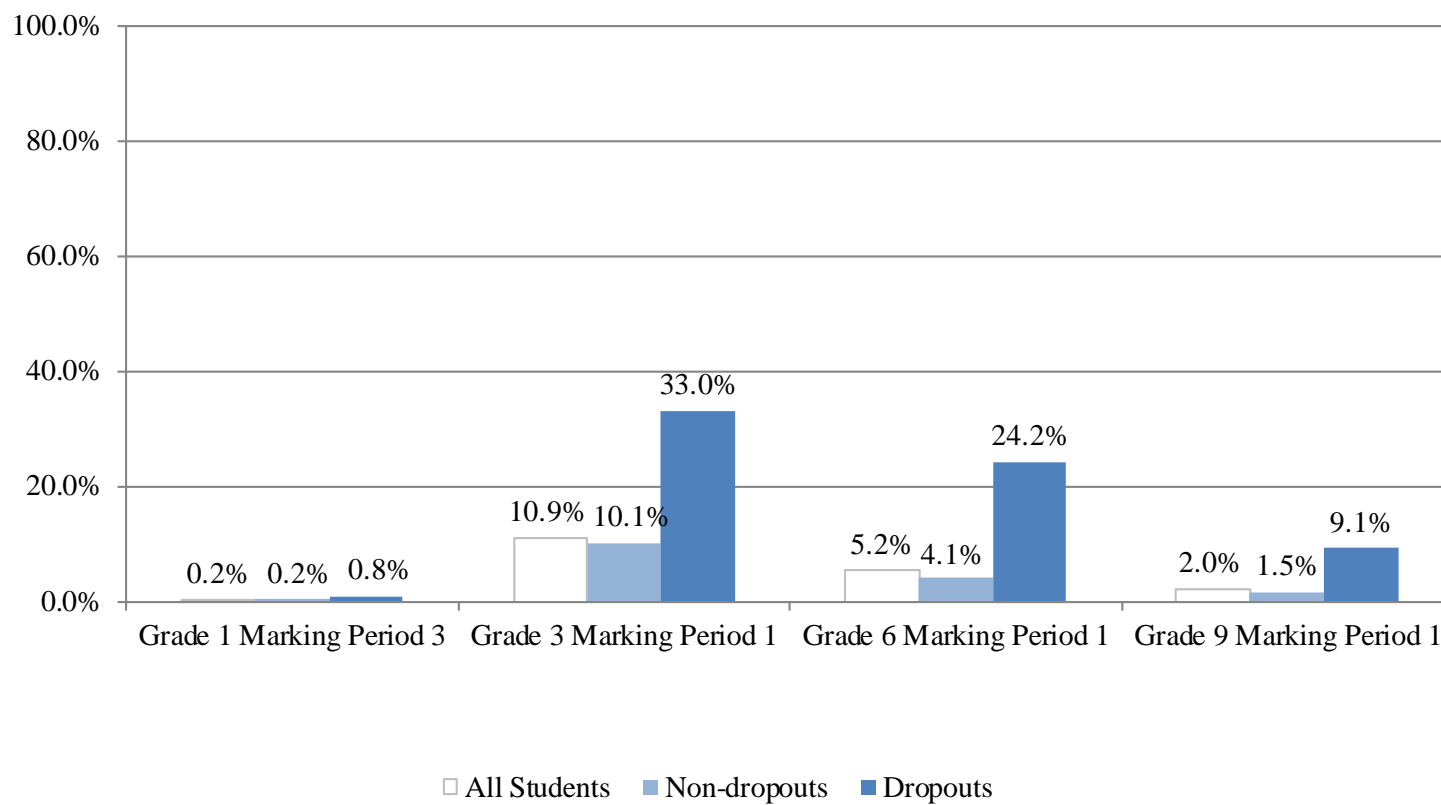
Identifying the Dropouts (Continued)

- Behavior

- In general, students in MCPS are suspended from school at a relatively low rate
- Across the four time points, behavior (as measured by number of in- and out-of-school suspensions) is not a prevalent characteristic of students who eventually drop out of high school
- Grade 3 report card mark for “not completing homework on time” used as additional indicator

Identifying the Dropouts (Continued)

Figure 4. Percentage of Class of 2011 students with a behavior indicator, by grade, marking period, and eventual dropout status.



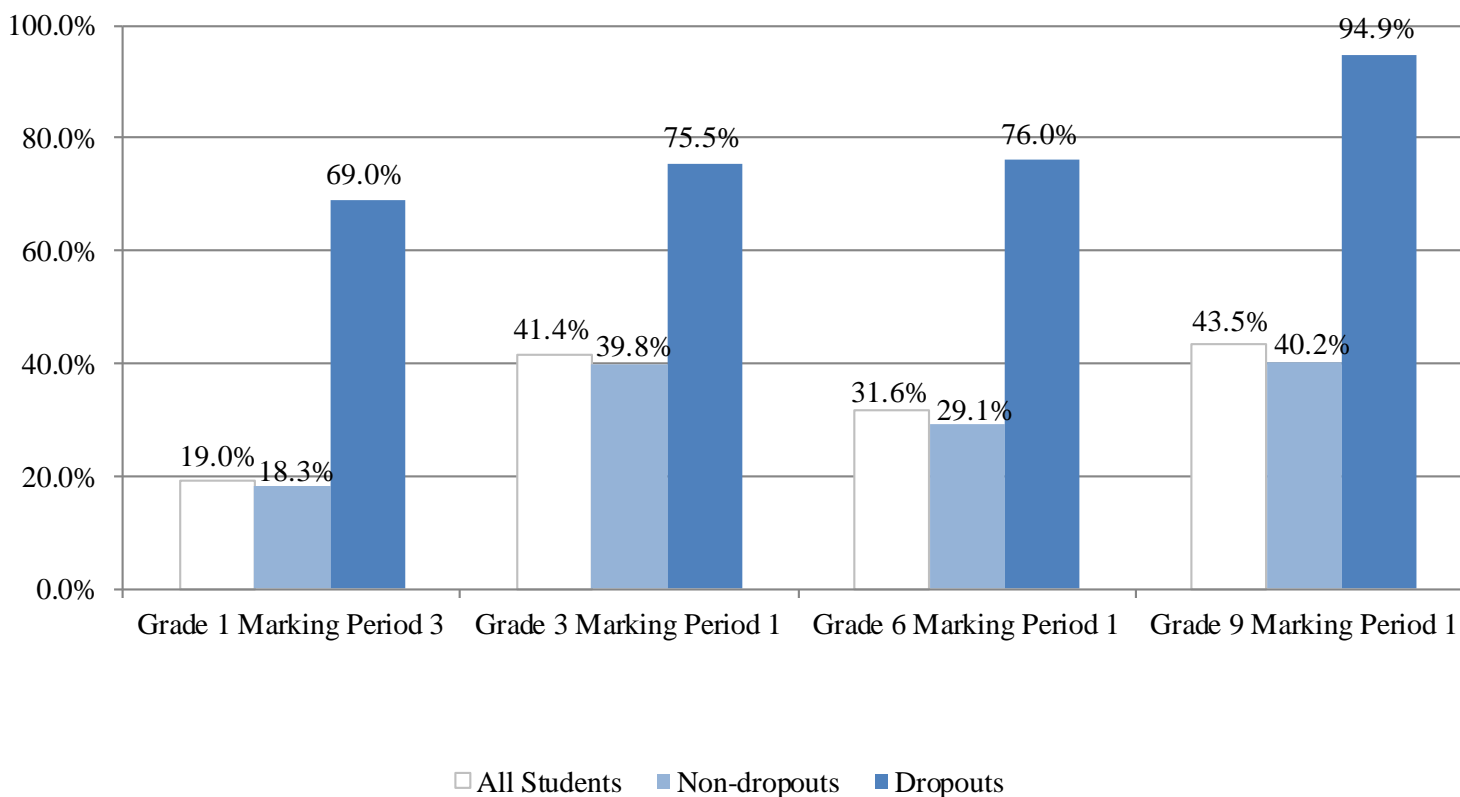
Identifying the Dropouts (Continued)

- Course Performance

- As done in prior early warning indicators research, course performance will be confined to failing mathematics and/or English
- For Grades 1 and 3, failing reading and/or mathematics will be defined as being “below grade level”
- For Grades 6 and 9, failing reading and/or mathematics will be defined as receiving a mark of “D” or below
- Additionally, all time points will also have a course performance indicator based on grade point average (GPA); for Grade 1 will be below 1.20; and for Grades 3, 6, and 9 will be below 3.00

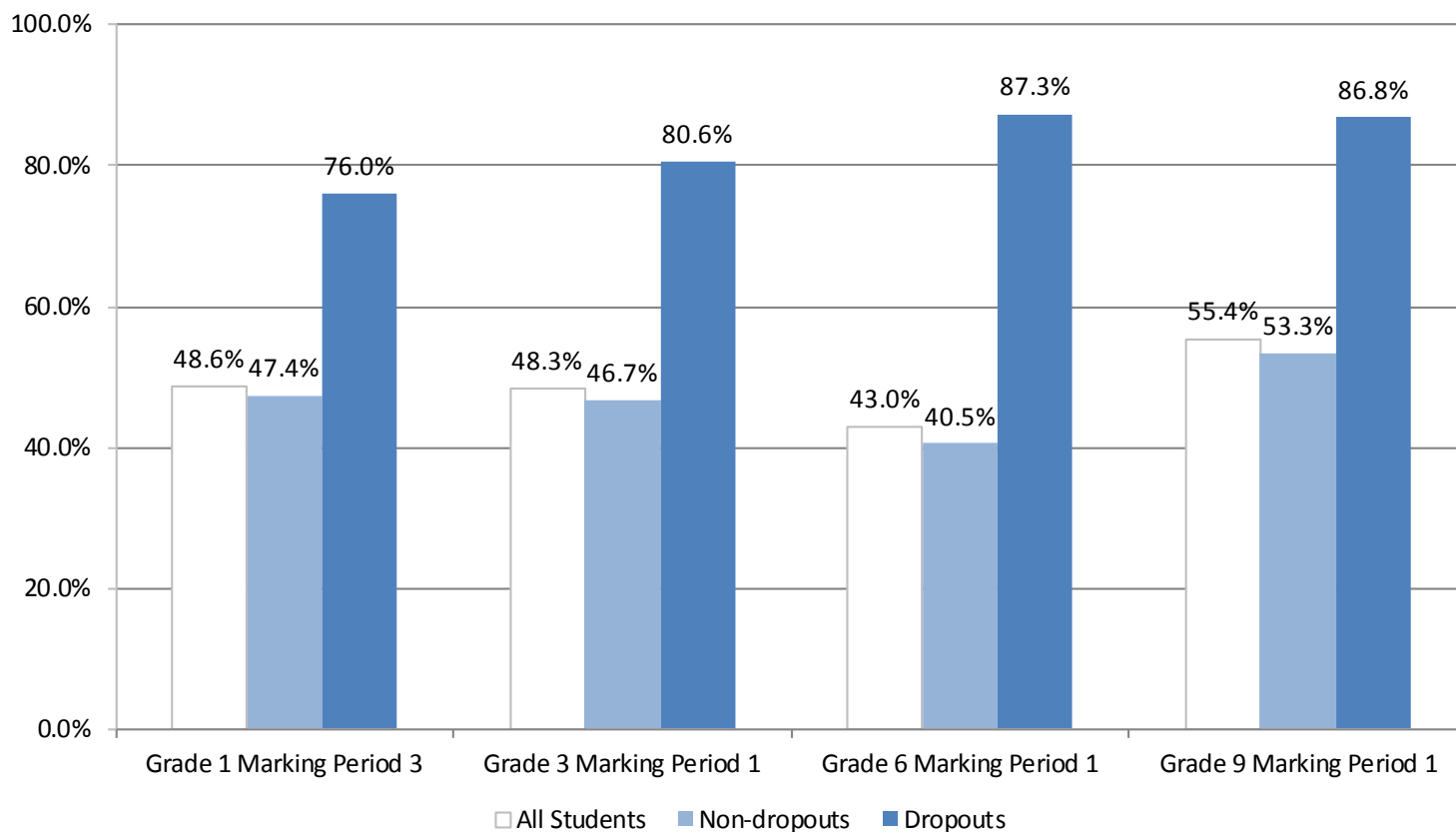
Identifying the Dropouts (Continued)

Figure 5. Percentage of Class of 2011 students with a coursework indicator, by grade, marking period, and eventual dropout status.



Identifying the Dropouts (Continued)

Figure 6. Percentage of Class of 2011 students identified as dropouts by grade, marking period, and eventual dropout status.



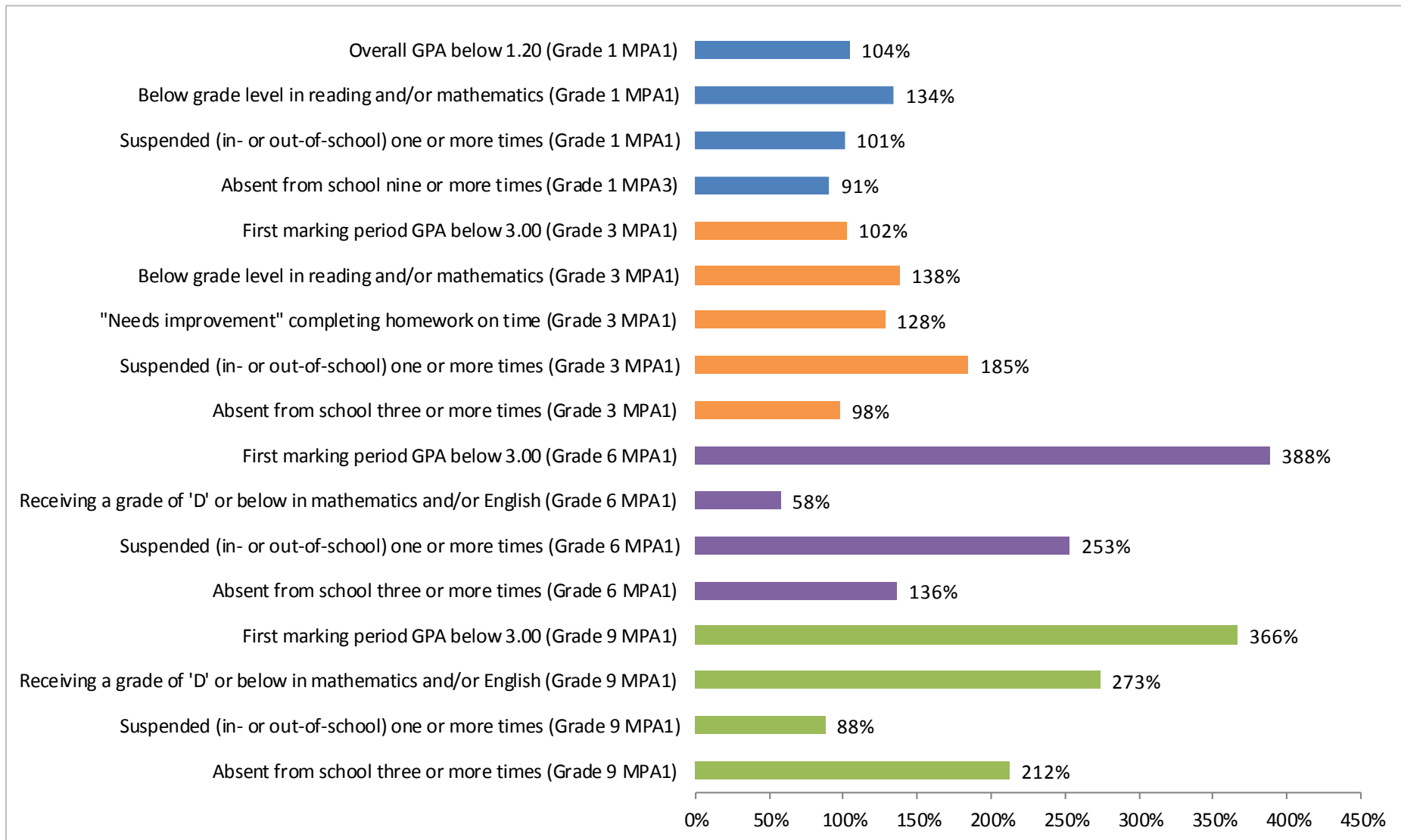
Identifying the Dropouts (Continued)

- Research Question #2
 - For each of the time points, what is the likelihood (odds) of students dropping out by each early warning indicator?

Table 2. Likelihood of Dropping Out of High School for the Class of 2011, by Grade, Marking Period, and Early Warning Indicator

Variable	Estimate	Standard error	Odds ratio	Z value	Sig. diff.
Grade 1 Marking Period 3^a					
Intercept	-3.974	0.113	0.019	-35.035	*
Absent from school nine or more times	0.646	0.139	1.907	4.659	*
Suspended (in- or out-of-school) one or more times	0.696	0.790	2.006	0.882	
Below grade level in reading and/or mathematics	0.850	0.153	2.340	5.561	*
Overall GPA below 1.20	0.713	0.157	2.040	4.552	*
Grade 3 Marking Period 1^b					
Intercept	-4.057	0.110	0.017	-36.865	*
Absent from school three or more times	0.682	0.141	1.978	4.844	*
Suspended (in- or out-of-school) one or more times	1.046	0.130	2.845	0.925	
'Needs improvement' completing homework on time	0.824	0.138	2.279	5.968	*
Below grade level in reading and/or mathematics	0.867	0.141	2.379	6.170	*
First marking period GPA below 3.00	0.704	0.153	2.022	4.596	*
Grade 6 Marking Period 1^c					
Intercept	-4.249	0.107	0.014	-39.630	*
Absent from a class three or more times	0.859	0.109	2.360	7.887	*
Suspended (in- or out-of-school) one or more times	1.261	0.137	3.528	9.200	*
Receiving a grade of 'D' or below in mathematics and/or English	0.454	0.122	1.575	3.726	*
First marking period GPA below 3.00	1.585	0.135	4.880	11.728	*
Grade 9 Marking Period 1^d					
Intercept	-5.116	0.152	0.006	-33.657	*
Absent from a class three or more times	1.138	0.104	3.120	10.919	*
Suspended (in- or out-of-school) one or more times	0.629	0.182	1.876	3.458	*
Receiving a grade of 'D' or below in mathematics and/or English	1.317	0.123	3.732	10.690	*
First marking period GPA below 3.00	1.539	0.178	4.661	8.629	*

Figure 7. Percent Change in Adjusted Odds of Dropping Out of High School for the Class of 2011, by Grade, Marking Period, and Early Warning Indicator



Identifying the Dropouts (Continued)

- Research Question #3
 - Are the early warning indicators for identifying the MCPS high school Class of 2011 dropouts reliable at identifying the Class of 2012 dropouts?

Identifying the Dropouts (Continued)

Table 3. Class of 2012 Early Warning Indicators, by Grade, Marking Period, and Dropout Status

Dropout Status	Early Warning Indicator										Total	
	Attendance		Behavior (1)		Behavior (2)		Coursework (1)		Coursework (2)			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Grade 1 Marking Period 3												
Non-dropouts	1,429	22.7	16	0.3	—	—	1,207	19.2	2,542	40.4	6,299	100.0
Dropouts	108	42.4	5	2.0	—	—	117	45.9	180	70.6	255	100.0
Total	1,537	23.5	21	0.3	—	—	1,324	20.2	2,722	41.5	6,554	100.0
Grade 3 Marking Period 1												
Non-dropouts	1,177	16.8	8	0.1	616	8.8	1,624	23.1	2,480	35.3	7,023	100.0
Dropouts	102	33.3	5	1.6	86	28.1	174	56.9	220	71.9	306	100.0
Total	1,308	17.6	13	0.2	702	9.6	1,798	24.5	2,700	36.8	7,329	100.0
Grade 6 Marking Period 1												
Non-dropouts	1,456	18.4	338	4.3	—	—	1,307	16.5	2,407	30.4	7,906	100.0
Dropouts	176	45.8	100	26.0	—	—	203	52.9	315	82.0	384	100.0
Total	1,632	19.7	438	5.3	—	—	1,510	18.2	2,722	32.8	8,290	100.0
Grade 9 Marking Period 1												
Non-dropouts	978	10.5	68	0.7	—	—	1,812	19.5	3,568	38.4	9,293	100.0
Dropouts	218	41.2	29	5.5	—	—	351	66.4	469	88.7	529	100.0
Total	1,196	12.2	97	1.0	—	—	2,163	22.0	4,037	41.1	9,822	100.0

Identifying the Dropouts (Continued)

- Summary of MCPS Early Warning Indicators
 - Attendance Indicator: Absent from school/class three or more times a marking period
 - Behavior Indicator: Suspended (in- or out-of-school) one or more times
 - Course Performance: 1) Below grade level/receiving a 'D' in mathematics and/or English; 2) Having a marking period grade point average below a 1.20/3.00

Identifying the Dropouts (Continued)

Figure 8. Percent of Class of 2011 Students by 1st and 6th Grade Indicator Status

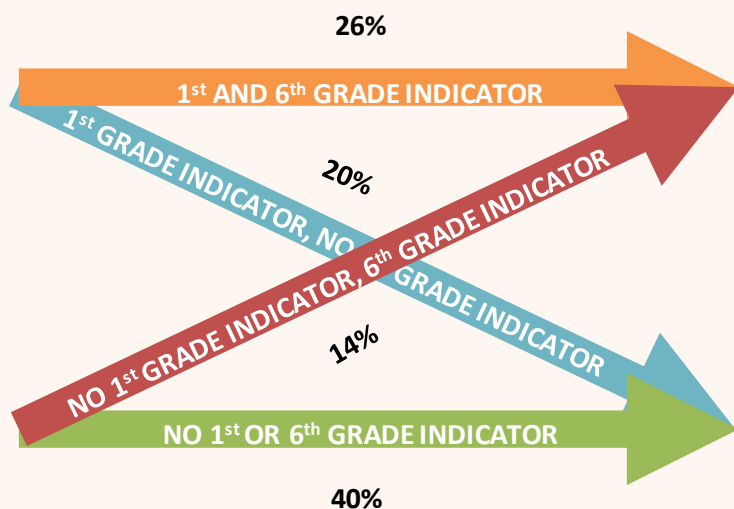
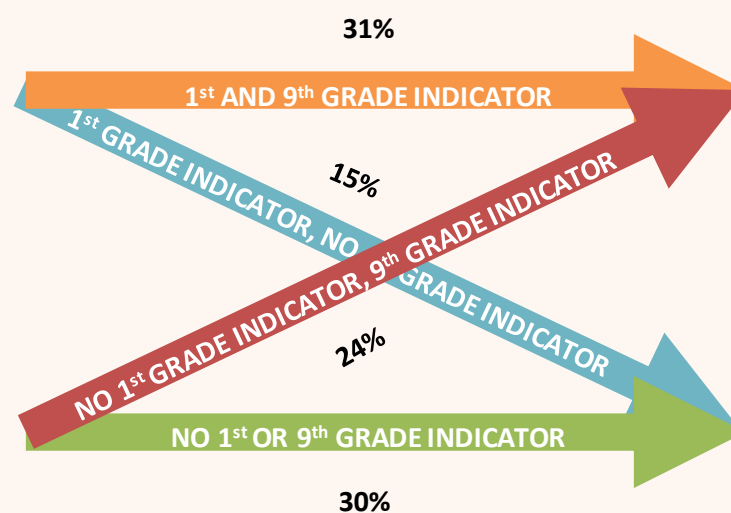


Figure 9. Percent of Class of 2011 Students by 1st and 9th Grade Indicator Status



Displaying Data: The Monitoring Tool

- How do stakeholders (teachers, principals, and counselors) access/use data?
- What type of technological resources are available?

Displaying Data: The Monitoring Tool (Continued)

Figure 10. Mock Early Warning Indicator Tool

Student ID	Student's Last Name	Student's First Name	Current Grade	Highest Number of Marking Period 1 Class Absences	Number of Marking Period 1 Suspensions	Marking Period 1 Grade Point Average	Attendance EW (Missed 3 or More Days)	Behavior EW (1 or More Suspensions)	Course Performance EW (GPA Below 3.00)	Number of EW Indicators
999999	SMITH	BILL	6	4	0	3.85	1	0	0	1
888888	SMITH	JOAN	6	0	0	2.66	0	0	1	1
777777	SMITH	AL	6	4	0	3.71	1	0	0	1
666666	SMITH	JAMES	6	3	0	3.57	1	0	0	1
555555	SMITH	BILL	6	5	0	3.71	1	0	0	1
444444	SMITH	JOAN	6	3	0	3.85	1	0	0	1
333333	SMITH	AL	6	2	0	2.00	0	0	1	1
222222	SMITH	JAMES	6	3	0	3.71	1	0	0	1
111111	SMITH	BILL	6	1	0	3.71	0	0	0	0
999999	SMITH	JOAN	6	5	0	3.42	1	0	0	1
888888	SMITH	AL	6	3	0	4.00	1	0	0	1
777777	SMITH	JAMES	6	2	0	3.33	0	0	0	0
666666	SMITH	BILL	6	10	0	3.57	1	0	0	1
555555	SMITH	JOAN	6	6	0	3.50	1	0	0	1
444444	SMITH	AL	6	0	0	3.28	0	0	0	0
333333	SMITH	JAMES	6	5	0	3.00	1	0	0	1
222222	SMITH	BILL	6	0	0	2.40	0	0	1	1
111111	SMITH	JOAN	6	5	0	3.85	1	0	0	1
999999	SMITH	AL	6	3	0	3.71	1	0	0	1
888888	SMITH	JAMES	6	6	0	2.71	1	0	1	2
777777	SMITH	BILL	6	3	0	3.71	1	0	0	1
666666	SMITH	JOAN	6	4	0	3.28	1	0	0	1
555555	SMITH	AL	6	5	0	2.33	1	0	1	2
444444	SMITH	JAMES	6	3	0	3.00	1	0	0	1

Limitations (Implementation, Implementation, Implementation)

- Type-I Error (False Positive)
- Early Warning Indicators are a platform for interventions, not an actual intervention
- Requires buy-in at all levels (e.g., administrators, teachers, and counselors)

- Type-I Error (False Positive)
 - Can be reduced based on number of indicators

Table 4. Number and Percentage of Class of 2011 Early Warning Indicators, by Grade, Marking Period, and Dropout Status

Dropout Status	Number of Early Warning Indicators (EWIs)										Total	
	No Indicators		One Indicator		Two Indicators		Three Indicators		Four Indicators			
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Grade 1 Marking Period 3												
Non-dropouts	3,227	52.6	1,628	26.5	976	15.9	306	5.0	3	0.0	6,140	100.0
Dropouts	63	24.0	57	21.8	95	36.3	46	17.6	1	0.4	262	100.0
Total	3,290	51.4	1,685	26.3	1,071	16.7	352	5.5	4	0.1	6,402	100.0
Grade 3 Marking Period 1												
Non-dropouts	3,684	53.3	1,576	22.7	1,130	16.3	447	6.5	85	1.2	6,913	100.0
Dropouts	64	19.4	53	16.1	112	33.9	79	23.9	22	6.7	330	100.0
Total	3,748	51.7	1,620	22.4	1,242	17.1	526	7.3	107	1.5	7,243	100.0
Grade 6 Marking Period 1												
Non-dropouts	4,566	59.5	1,813	23.6	897	11.7	340	4.4	52	0.7	7,668	100.0
Dropouts	56	12.7	103	23.3	147	33.3	98	22.2	38	8.6	442	100.0
Total	4,622	57.0	1,916	23.6	1,044	12.9	438	5.4	90	1.1	8,110	100.0
Grade 9 Marking Period 1												
Non-dropouts	4,199	46.7	2,359	26.2	1,583	17.6	787	8.7	71	0.8	8,999	100.0
Dropouts	77	13.2	67	11.5	129	22.1	264	45.2	47	8.0	584	100.0
Total	4,276	44.6	2,426	25.3	1,712	17.9	1,051	11.0	118	1.2	9,583	100.0

- Only 2 out of 52 columns actually have to do with the model

Figure 11. Mock Grade 8 to 9 Monitoring Tool

[illegible]

- Requires buy-in at all levels (e.g., administrators, teachers, and counselors)
 - Recent independent evaluation of the implementation of Ninth Grade Academies in 18 high schools Broward County Public Schools, FL
 - Findings:
 - Only 3 high schools achieved strong implementation
 - Most schools did not improve from the first to the second or third year (Legters, Parise, & Rappaport, 2013)

Future Thoughts

- Should early warning indicators be shared with parents and students?
- Should early warning indicators be displayed publically at the school, district, and state-level?
- Are these students already identified by informal processes?
- Are there students who become disengaged over time or who become engaged over time different than the students who are disengaged since first grade and/or students who are engaged since first grade?
- Can a colorblind approach address equity concerns?

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Want to talk more?
Have Questions?
Want help developing your own
models?

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