LEVEL UP TO INCREASE GRADUATION

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August 1, 2019

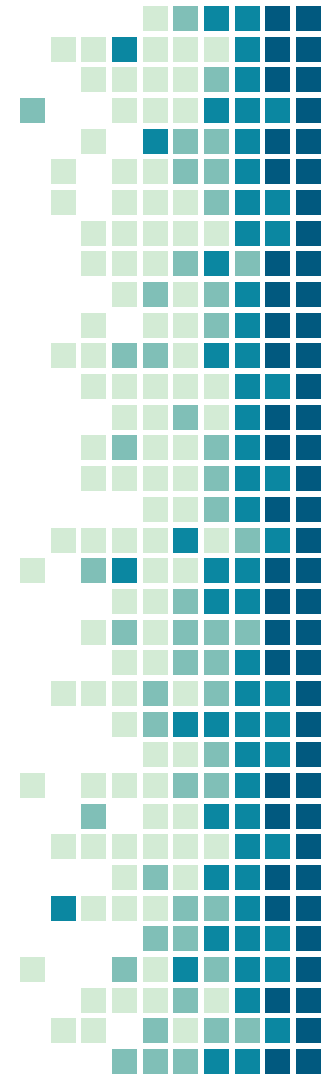# 90%

US Goal for 4-year high school graduation rate

84.6%

2016–17 actual 4-year high school graduation rate

$5,200 NEGATIVE

High School dropout costs society

GOAL

Build a tool that shows different actions a school administrator could implement to significantly improve graduation rates.

US DEPARTMENT OF EDUCATION DATA

GRADUATION DATA

- 23,090 schools
- Graduation rates masked for schools with graduation classes 300 and smaller
- 2015-16 School Year
- Many variables missing
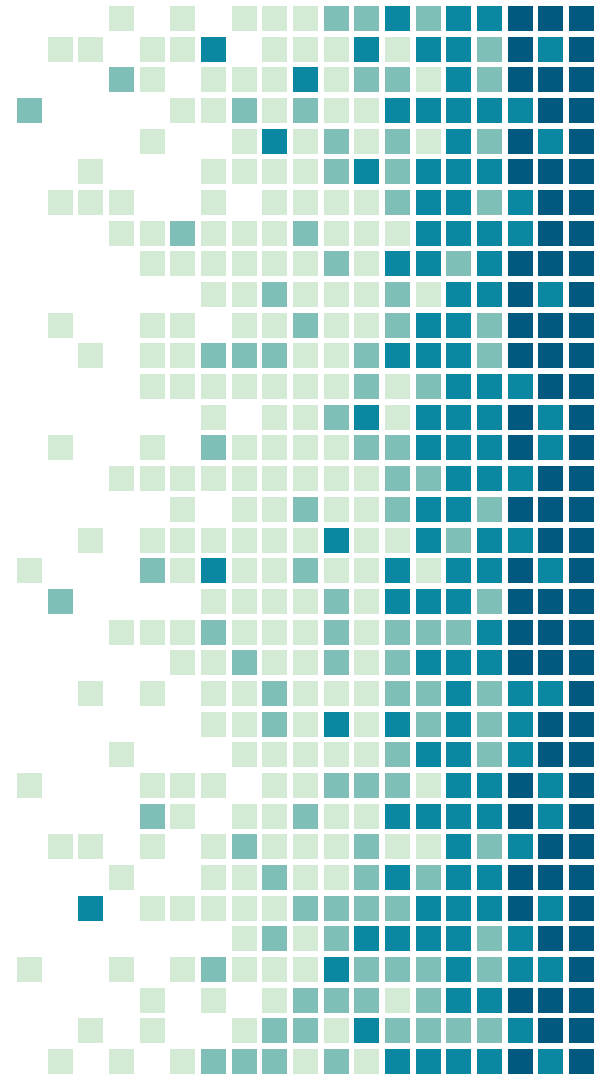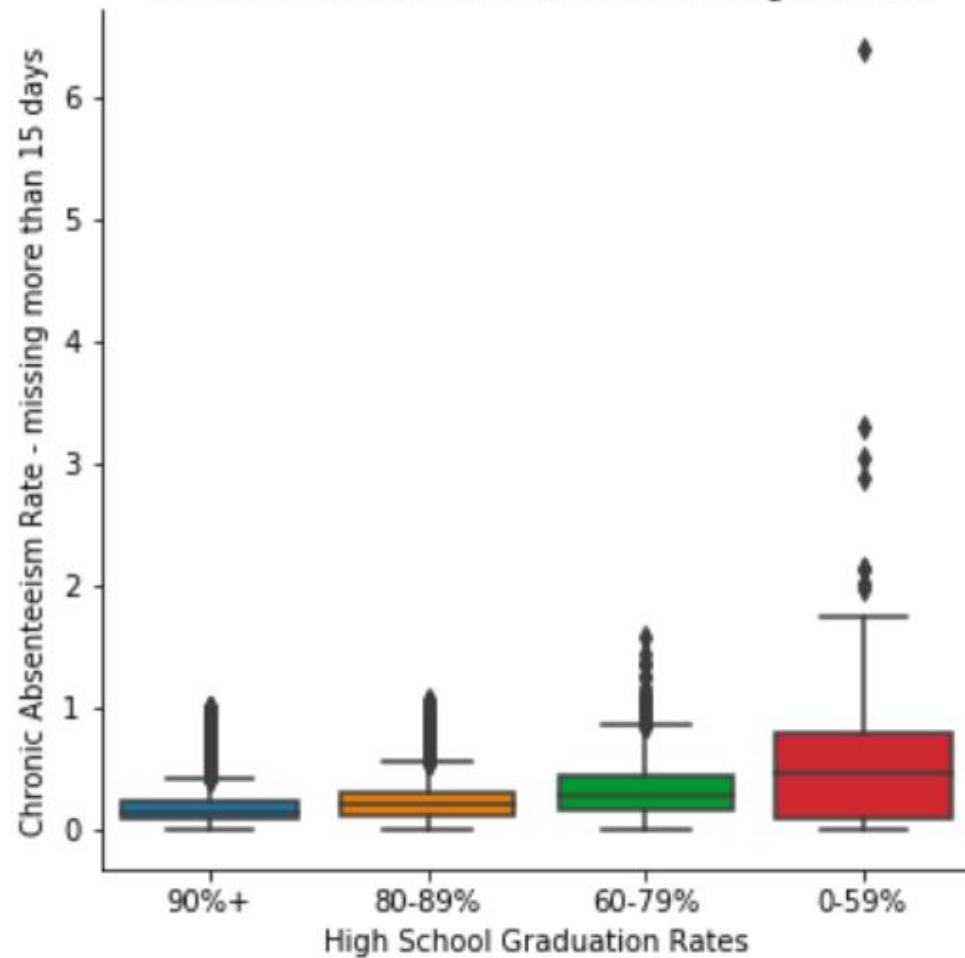- Unbalanced

OFFICE FOR CIVIL RIGHTS DATA

- 96,359 schools includes elementary, middle, high, alternative, juvenile justice, special ed, etc.
- 1,836 variables including discipline, classes, harassment, absenteeism, sports, teacher certification, budgets, etc.
- Noisy

GRADUATION RATES

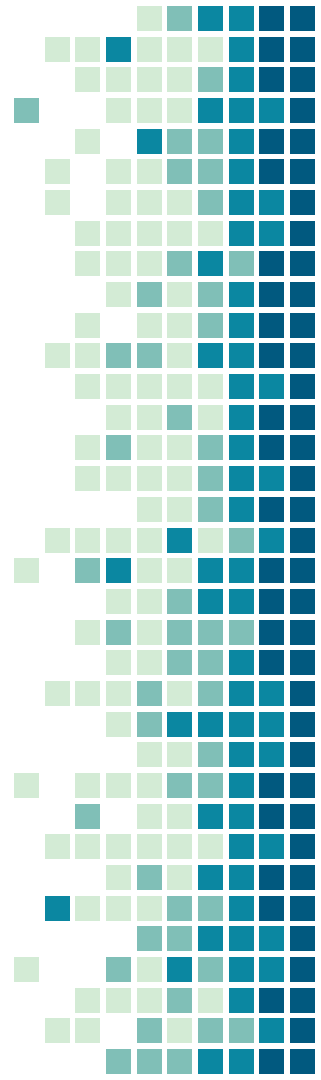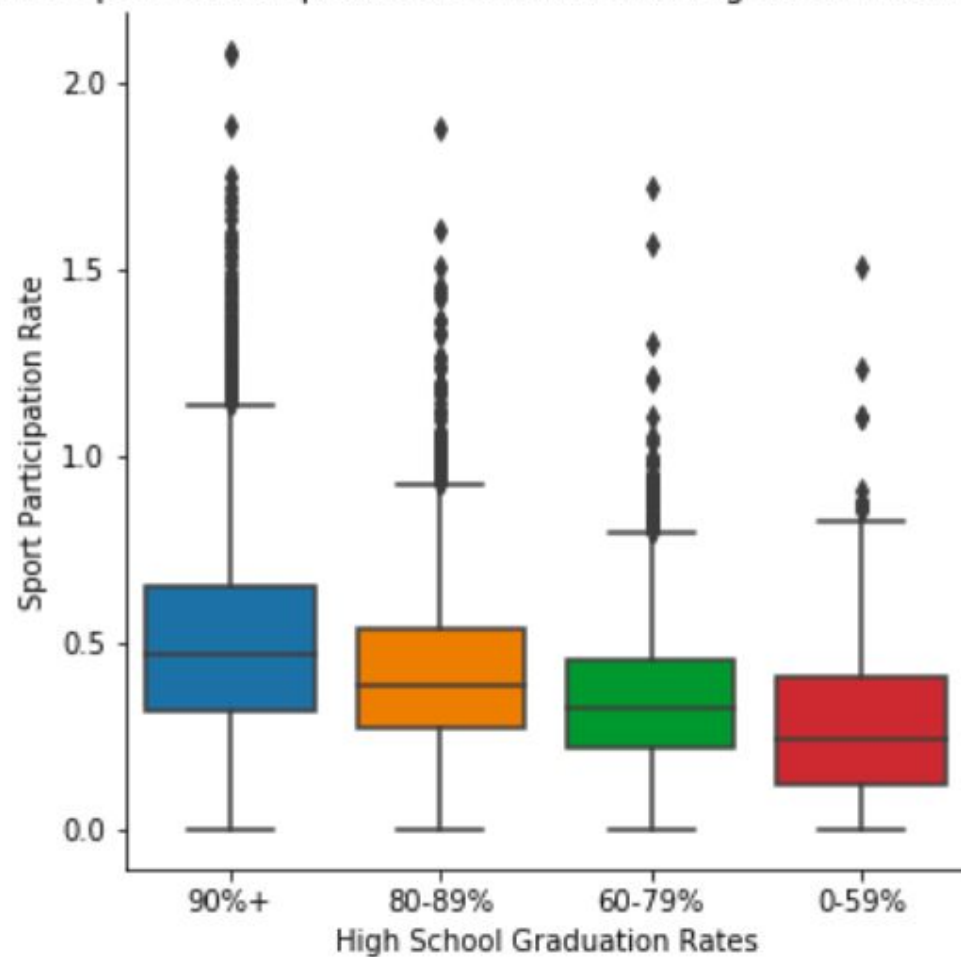| GRADUATION RATES	NUMBER OF SCHOOLS
90-99+%	**8,712**
80-89%	**4,257**
60-79%	**1,993**
0-59%	**1,611**

More Absenteeism at Low Performing Schools

More Sports Participation at Schools with Higher Graduation Rates

DIFFERENT NON-CERTIFIED RATES

	GRADUATION RATES	NON-CERTIFIED TEACHER RATE MEAN
	90-99+%	**2.13%**
	80-89%	**2.71%**
	60-79%	**4.97%**
	0-59%	**6.93%**

DIFFERENT SUSPENSION DAY RATES

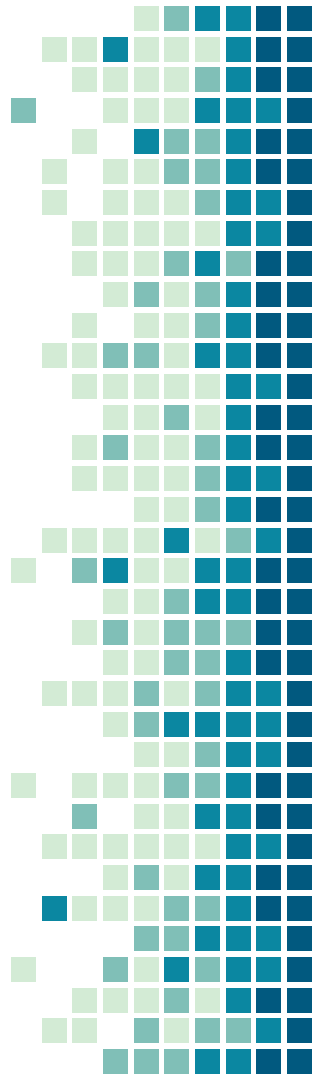| GRADUATION RATES	SUSPENSION DAY RATE MEAN
90-99+%	**12.14%**
80-89%	**28.43%**
60-79%	**54.38%**
0-59%	**50.90%**

MACHINE LEARNING MODELS

Linear Regression

Only 4,100 schools available to consider due to masking. Model failed to predict. Tried some variables, all with Lasso, Elastic Net.
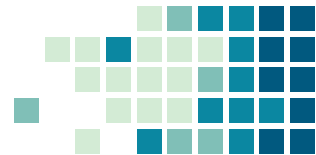
Random Forests

Binned schools to 16,500 schools. Tried random forests, balanced random forests, class weighting, grid search.

Final Product

Build a Shiny app that generates the middle 50% range for the four metrics for the schools with the next higher graduation rate.

FIRST SHINY APP

Actions that Lead to Increases in High School Graduations

Which State?

MARYLAND

Which School District?

Montgomery County Public Schools

Which High School?

Richard Montgomery High

Submit

Show 25 entries   Search:

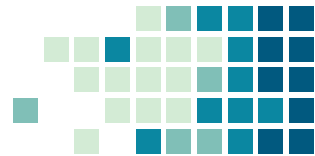|	**3194**
State	MARYLAND
District	Montgomery County Public Schools
High_School	Richard Montgomery High
Graduation_Rate_2015_16	93
Total_Enrollment	2252
Number_of_Chronically_Absent_Students	454
Number_of_Student_Athletes	862
Number_of_Days_Missed_to_Suspensions	36
Number_of_Non_Certified_Teachers	1.6
Level_Up_Graduation_Rate	100% Level Up Rate
Level_Up_25th_Percentile_Number_Chronic_Absent_Students	190
Level_Up_75th_Percentile_Number_Chronic_Absent_Students	503
Level_Up_25th_Percentile_Student_Athletes	719
Level_Up_75th_Percentile_Student_Athletes	1463
Level_Up_25th_Percentile_Days_Missed_due_to_Suspension	36
Level_Up_75th_Percentile_Days_Missed_due_to_Suspension	334
Level_Up_25th_Percentile_Non_Certified_Teachers	0
Level_up_25th_Percentile_Non_Certified_Teachers	0

Showing 1 to 18 of 18 entries

Previous   1   Next

CURRENT SHINY APP

What affects school graduation rates?

Which State?

VIRGINIA ▼

Which School District?

FAIRFAX CO PBLC SCHS ▼

Which High School?

SOUTH LAKES HIGH ▼

Submit

Show 10 ▼ entries

Search:

	10818
State	VIRGINIA
District	FAIRFAX CO PBLC SCHS
High_School	SOUTH LAKES HIGH
Graduation_Rate_2015_16	84
Total_Enrollment	2441

Absenteeism
0   2441
435

Athletes
0   2441
973

Suspensions
0   2441
44

Non-Certifications

This high school reported **435** chronically absent students out of a total student enrollment of **2441** students. Chronic absenteeism is defined here in this US Department of Education dataset as missing at least 15 days of school for any reason, excused or unexcused. Chronic absenteeism is often associated with lower graduation rates.

Schools that had the next-level up or better graduation rates reported the number of chronically absent students ranged from **310** to **737** students.

This high school reported **973** student athletes out of a total student enrollment of **2441** students. Students participating in team sports are often more engaged in school and have better attendance. Because of multiple sports seasons, some schools may report individual students multiple times. More student athletes is often associated with higher graduation rates.
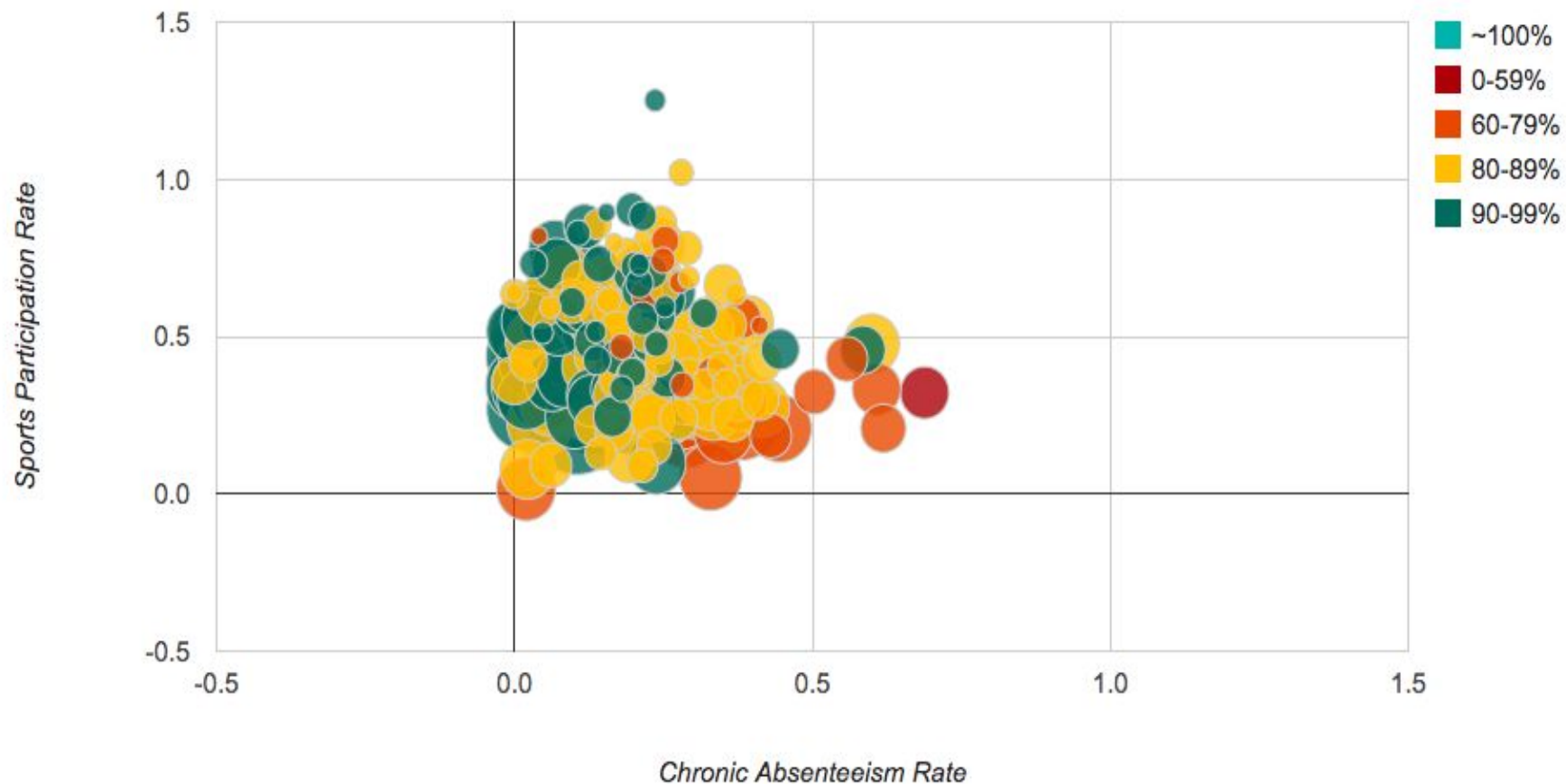
Schools that had the next-level up or better graduation rates reported the number of student athletes ranged from **673** to **1310** students.

This high school reported the total number of days missed to suspensions was **44** days. Missing days of school for any reason, including suspensions, is often associated with lower graduation rates.

Schools that had the next-level up or better graduation rates reported a range of days missed to suspensions from **128** to **858** days.

This high school reported **14** non-certified teachers out of a total of **178.67** teachers. Non-certified teachers often teach required classes for graduation, having more non-certified teachers is often associated with lower graduation rates.

How Sports Participation and Chronic Absenteeism Influence Graduation Rates (School Year 2015-16) - VIRGINIA

THANKS!

Any questions?

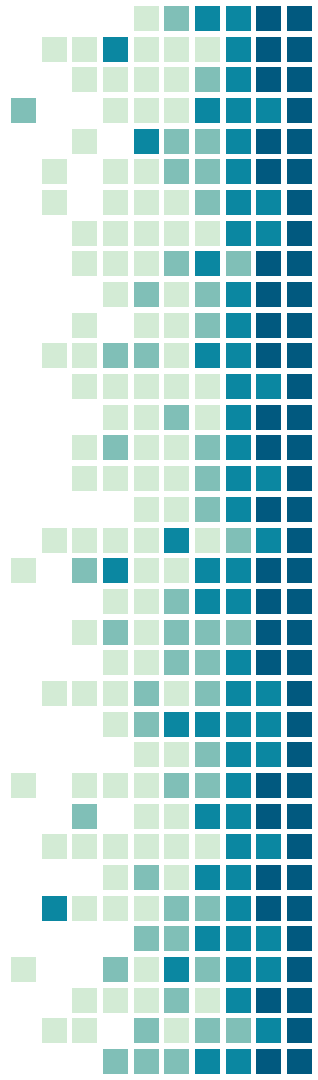You can find me at:

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CREDITS

Special thanks to all the people who made and released these awesome resources for free:

- Presentation template by SlidesCarnival
- Photographs by Unsplash

PRESENTATION DESIGN

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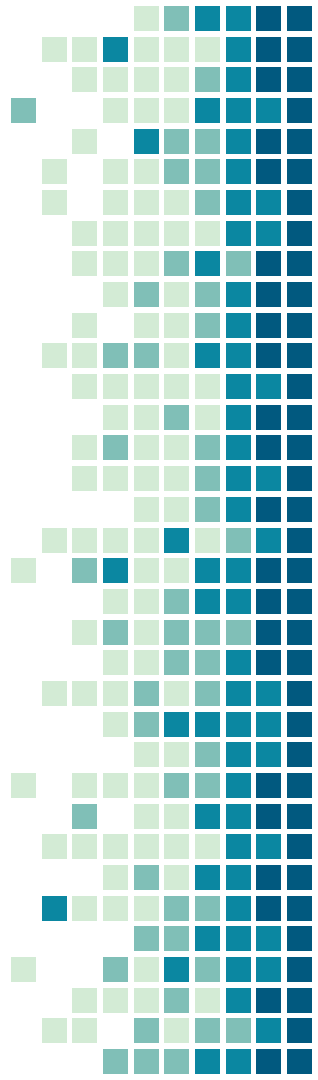- Titles: **Dosis**
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