Influencing High School Graduation Rates

Presented by: Helen Levy-Myers, Athena’s Workshop
GASP! Government Advances in Statistical Programming
October 24, 2018
Data

- Graduation data
  - 23,090 observations (high schools)
  - 28 variables - state name, NCES ID, graduation rate by male and female, cohort size, enrollment, etc.

- OCR data
  - 96,360 observations (pre-schools, elementary, middle, high schools, juvénile justice, alternative, charters, etc.)
  - 1,836 variables, bullying, teacher certification, absenteeism, sports participation, AP class, suspensions, expulsions, gender, ethnicity, disability, LEP, etc. subsets.

- Data examined totals for each variable.
2015-16 Chronic Absenteeism and Graduation Rates by State
With Red Linear Regression Line, Adjusted R Squared: .1899
2015-16 AP Class Participation and Graduation Rates by State

With Green Linear Regression Line, Adjusted R Squared: .3138
95% Confidence Intervals

- AP Class Participation Rate
- Sport Participation Rate
- SAT/ACT Rate
- Teacher Absenteeism Rate
- In-School-Suspension Rate
- Teacher/Student Rate
- Harassment/Bullying Report Rate
- Biology Class Rate
- Activities Funds/Student Rate
- Teachers without Certification Rate
- Geometry Class Rate
- Chronic Absenteeism Rate
Graduation Rates
Actual vs. Model Prediction

GradPredictionModel2 <- lm(GRAD_RATE ~ (ChrAbsentRate + APRate + SportRate), data = JoinModel1516)
grad1516predict2 <- predict(GradPredictionModel2, newdata = newData1516a, interval = "confidence")

Residual standard error: 14.22 on 13061 degrees of freedom
Multiple R-squared: 0.2824, Adjusted R-squared: 0.2822
F-statistic: 1713 on 3 and 13061 DF, p-value: < 2.2e-16

Schools:
South Lakes High School (Fairfax County Public Schools, VA)
H.D. Woodson High School (District of Columbia Public Schools, DC)
John F. Kennedy High School (Montgomery County Schools, MD)
Changes to Achieve 90% Graduation

- More Sports Participation
- More AP Class Participation
- Fewer Absent Students

John F. Kennedy High School (Montgomery County Schools, MD)
H.D. Woodson High School (District of Columbia Public Schools, DC)
South Lakes High School (Fairfax County Public Schools, VA)
Data Sources

- https://www2.ed.gov/about/offices/list/ocr/docs/crdc-2013-14.html
- https://www2.ed.gov/about/offices/list/ocr/docs/crdc-2015-16.html
Thank you

- Michael Jadoo for inviting me to present this information
- Reuben Levy-Myers for advice on the presentation
- Nathanael Aff for advice and help on modeling and data cleaning
Let’s Keep In Touch

- Helen Levy-Myers
- Athena’s Workshop
- Email: Hlevy-myers@athenasworkshop.com
- Phone: 703-615-4429
- Twitter: @hlevymyers