Philly School R Shiny App

-- Yan He, May 2021

1. About the App:

1.1 How to Use This App

There are 3 tabs in the App.

- Mapping School Characteristics: Display the differences in school characteristics among different areas.
- Explore Philly School Data: Explore the correlation between school outcomes and different school characteristics.
- Analyzing School Outcomes: Build regression models and predict the Student Attendance rate, number of withdrawals and unique suspended students.

To begin, select "Mapping School Characteristics" on the navigation bar. Users will be asked to choose the variable of interest and the school level. Based on the data of school level the users choose, the map will display the average of the variable that the users are interested in by zip codes, as well the average Race distribution in each Zip code. To be noted, when user chooses both school levels, the map will display the averages across all school in each zip code area. 4 colors in the map represent the quantiles where the averages are in.

The second tab "Explore Philly School Data" on the navigation bar will allow users to choose the 3 school outcomes and other different school characteristic measurements. Once users set their selection, the main panel will present the correlation plots of between the selected school outcome and the school characteristics. Each plot shows the data for both Elementary school (red dots) and Middle School/above (blue dots).

In the third tab "Analyzing School Outcomes", users can select a series of independent variables from the sidebar on the right to build the regression models. There are 3 OLS models where the dependent variables are Student Attendance rate, Student withdrawals and Unique suspended students per year. The table displays the regression results for 3 models simultaneously, given selected explanatory variables.

1.2 The Data

This app uses data from the Philly school data. The data includes all different school characteristics such as student race composition, school address. The data also includes some school outcome measurements such as student attendance rate, student withdrawals and suspension numbers.

2. Analyzing Findings:

From the regression models in the 3rd tab, we can see that when controlling for school level, low-income family rate, thefts, teacher attendance, special education rate and gifted student rate, on average, holding other variables fixed, there are significant relationships between thefts per 100 students, teacher attendance, gifted education student rate and all three school outcomes (attendance, withdrawals, suspension). Specifically, more thefts per 100 students will lead to worse school outcomes—lower student attendance rate, more student withdrawals and suspensions; higher teacher attendance and higher percentage of students receiving gifted

education will lead to better school outcomes—higher student attendance rate, fewer student withdrawals and suspensions.

Also, there are significant relations between low-income family rate, special education student rate and student attendance rate—higher percentage of students from low-income family or receiving special education leads to lower student attendance in a school. There is marginally significant relation between low-income family rate and the withdrawals, the higher the percentage of students from low-income family is, the more withdrawals there will be in the school.

Furthermore, there is significant differences in student attendance and unique suspended students between Elementary school and Middle school/above. Holding all other variables fixed, Middle school or above has lower student attendance and higher suspensions on average, compared to Elementary school.

The correlation plots in the 2nd tab also reflects the patterns in the regression models.