Predictors Of Ohio High School Cross Country Running Success

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Introduction

We explored the relationship between Ohio high school cross country running success and potential demographic explanatory variables that include:

- High school enrollment size
- Socioeconomic status
- District geography
- Racial/ethnic demographics

Previous scholarship shows that differences in high school enrollment size impacts cross country team success rates. Monte Carlo simulations find that larger high schools win the state meet disproportionately to their relative sizes.[1]

Data Sources

We collected data from 2017 to 2021 from the following:

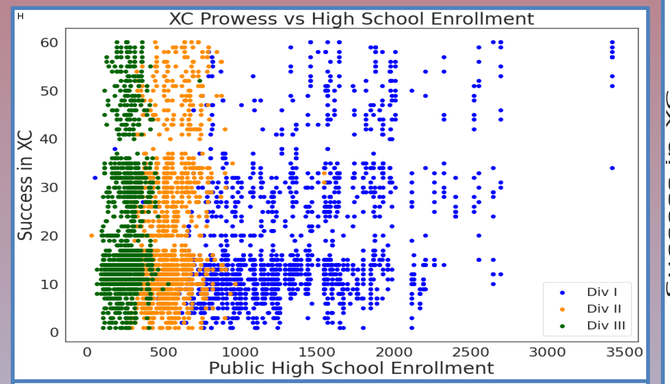
- Ohio Department of Education: Contains high school enrollment data and district categorization data.
- US Census: Has five year estimates on median income, population density, and racial makeup within each Ohio school district for 2020.
- Ohio High School Athletic Association (OHSAA) and Baum's Page: Includes data on cross country performance such as placement and appearances in the most crucial meets (state, regional, and district meets).

XC Performance Measures

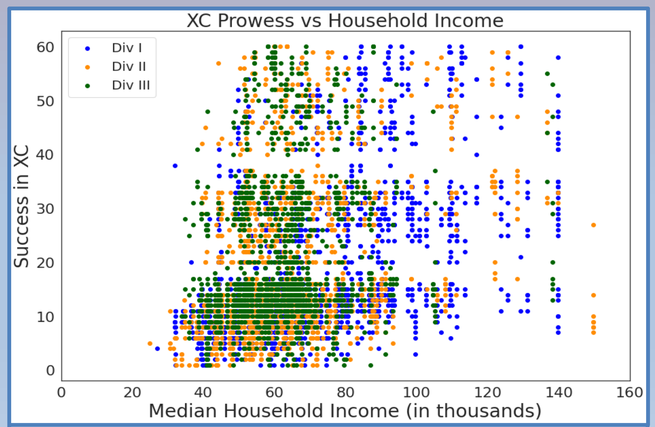
XC Score	Team Success	XC Score Calculation
0-15	Team stops in first round "district" race	21 – (Placement in "district" race)
15-35	Team stops in second round "regional" race	41 – (Placement in "regional" race)
41-60	Team places in final "state championship" race	61 – (Placement in "state championship" race)

Results

We found a positive, almost moderately strong correlation between high school enrollment size and success in cross country for Division I high school cross country teams with weaker correlations for Divisions II and III. We see a similar trend with the correlation between median household income and success in cross country.



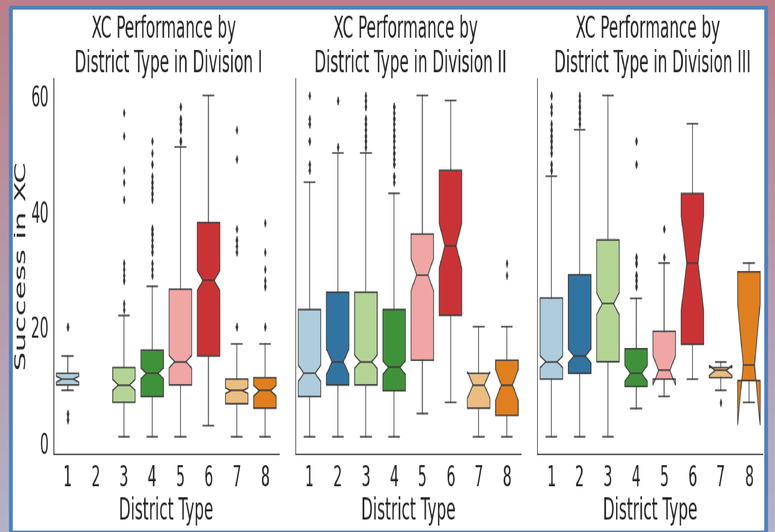
Correlation Coef for Div I: 0.40
Correlation Coef for Div II: 0.27
Correlation Coef for Div III: 0.16

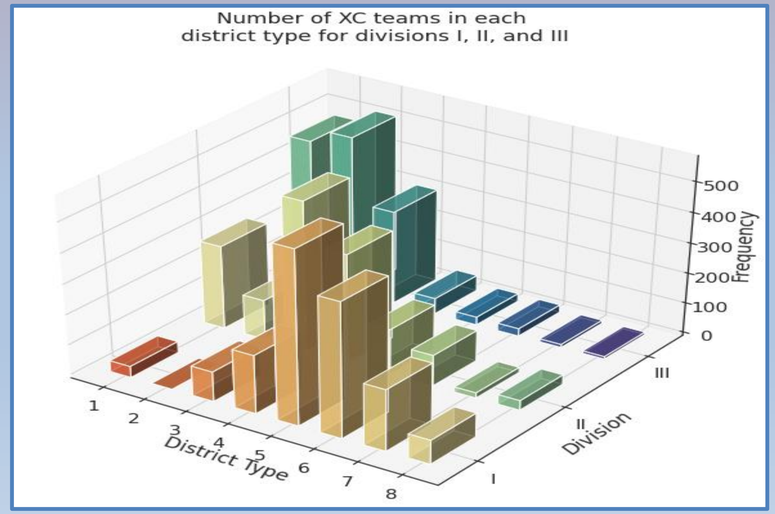


Correlation Coef for Div I: 0.47
Correlation Coef for Div II: 0.29
Correlation Coef for Div III: 0.17

Results (continued)

The cross country teams located in suburban areas with lower student poverty demonstrate higher levels of competitive success.





District Type Key

District Type	Location	Student Poverty	Student Population
1	Rural	High	Small
2	Rural	Average	Very Small
3	Small Town	Low	Small
4	Small town	High	Average
5	Suburban	Low	Average
6	Suburban	Very Low	Large
7	Urban	High	Average
8	Urban	Very High	Very Large

Conclusion

- In Division I, high schools with larger enrollment sizes and in areas with greater median household income tend to perform better in cross country. This relationship is not as strong in Divisions II and III.
- Ohio high school cross country teams in suburban locations show better success. Teams in dense urban areas demonstrate the least success.
- Ohio high school cross country teams in areas with lower poverty levels show higher performance.
- Division I Ohio high school cross country teams are primarily in suburban and urban areas. Division II and III cross country teams are primarily in small town and rural areas respectively.

Acknowledgements

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Works Cited

[1]Kretchmar, M. "The Effect of School Size on Cross Country Performance." Great Lakes Data Analytics Conference. Stevens Point, WI. 2019.