Introduction: Lizzy Dixon
Girls Inc. of the Valley currently serves 474 girls ages 5-18 from the greater Chicopee, Holyoke, and Springfield areas. These girls participate in low cost or free mentoring and programming in a variety of areas, including leadership, media literacy, healthy sexuality, and self-defense. These after school and summer programs are designed to improve self-confidence and access to opportunity, inspiring participants to be strong, smart, and bold.

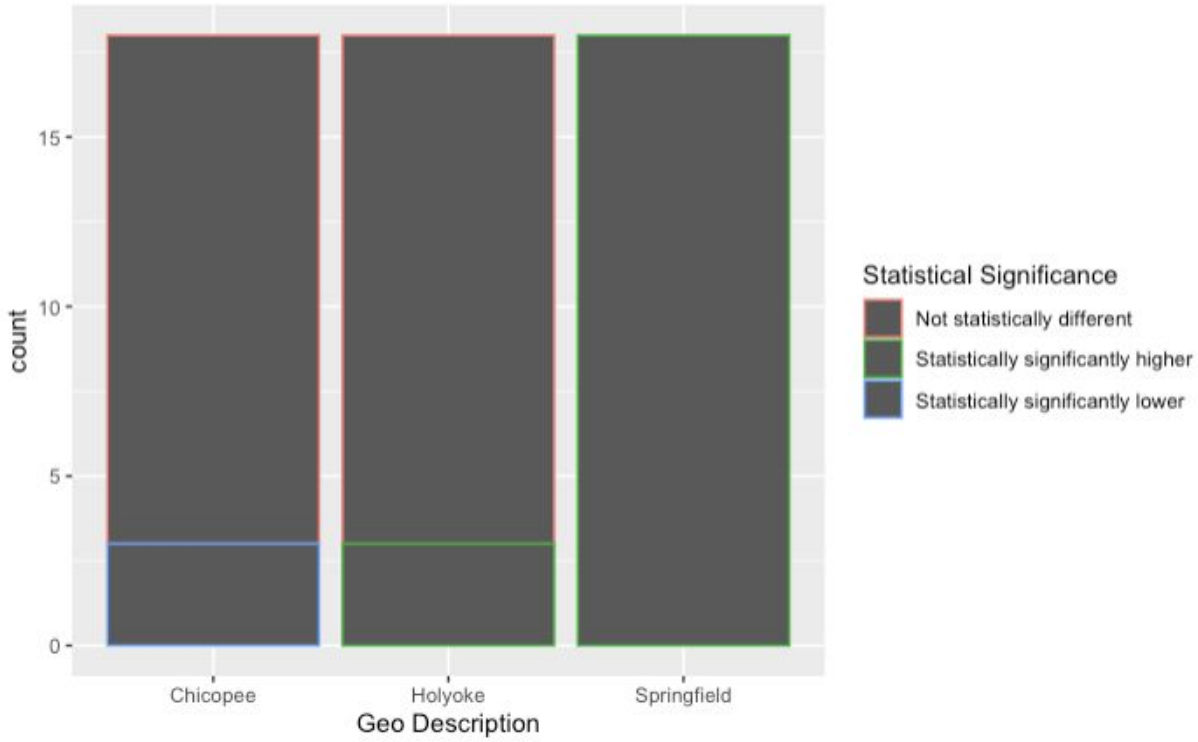
The aim of this project is to demonstrate the environmental stressors that Girls Inc. participants face in their communities. Though there are many factors at play in these communities, we chose to begin by investigating water quality, blood lead levels, asthma prevalence, school readiness, and redlining in the communities Girls Inc. serves. It is our hope that revealing these stressors will reinforce the need for Girls Inc. programs. Girls Inc. programming and mentorship may serve as protective factors and provide extra support for at-risk girls. We also aim to tell a story of strength. Despite facing these increased stressors and decreased school readiness, the Girls Inc. participants are resilient and strong.

Reese Hirota

Average Annual Prevalence of Males and Females with Estimated Confirmed Blood Lead Levels ≥5 μg/dL in 2012 - 2017 that were between 9 - <48 Months of age

The data is sourced from Mass.gov, under their Lead Data and Reports. After filtering for the three communities served by Girls, Inc. of the Valley, I found that from 2012 through 2017, Springfield in particular consistently had a statistically significantly higher prevalence of lead levels than other Massachusetts communities. Holyoke too had some counts of a statistically significantly higher prevalence of lead levels, though the majority of counts were not statistically different. Chicopee fared much better with lead levels either not statistically different, or occasionally statistically significantly

lower.



Maha Mapara

Asthma hospitalizations, ER visits and pediatric asthma prevalence

The data is sourced from Mass.gov under their Asthma Data and Reports. The data sets were filtered so that we would have data from the three communities that Girls Inc. of the Valley serve- Chicopee, Holyoke, Springfield.

Three data sets were explored:

1. Asthma hospitalizations from 2000 to 2015 for males and females from under 5 to 34 years of age,
2. ER visits due to asthma from 2000 to 2015 for males and females from under 5 to 34 years of age,
3. Pediatric asthma prevalence per 100 students for females aged 5 to 14, for the school years 2009-2010 to 2016-2017.

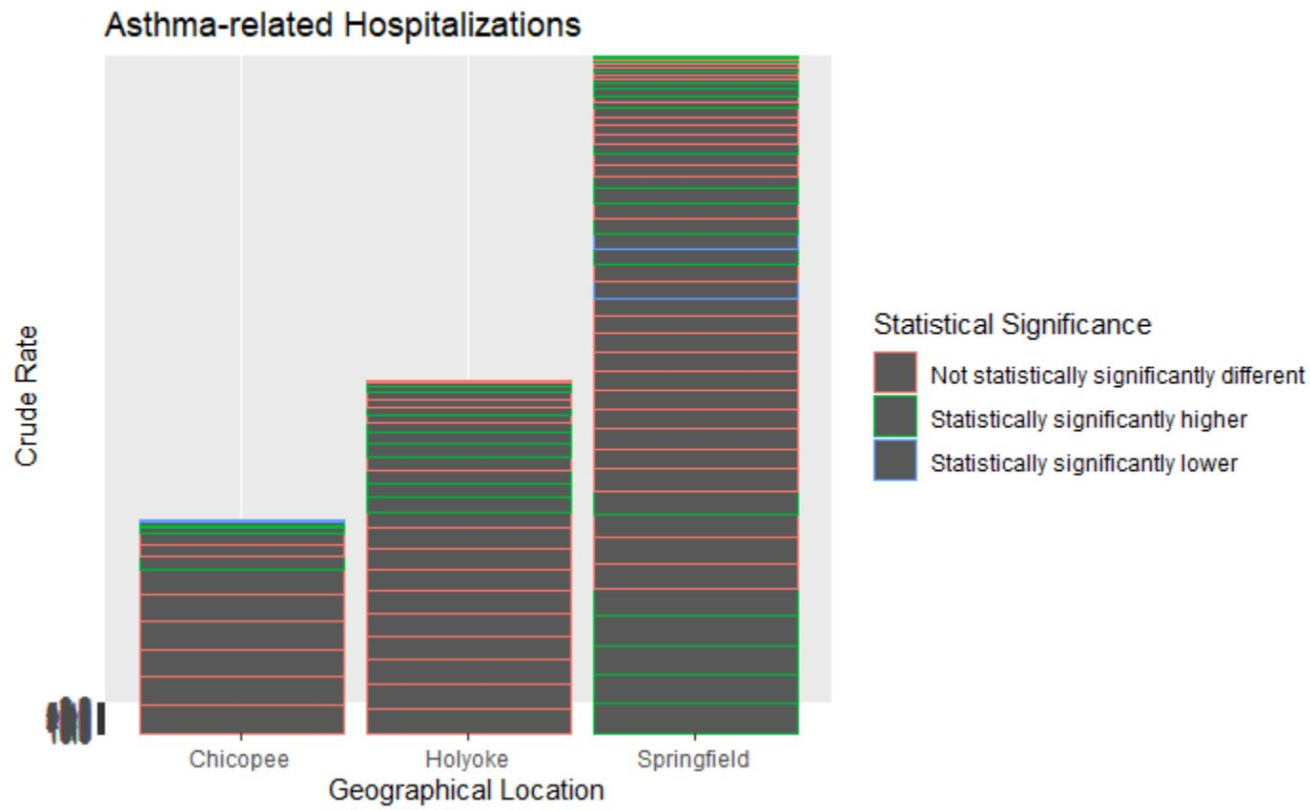


Figure 2.1: Asthma-related hospitalizations by crude rate

All three cities have significantly higher asthma related hospitalizations rates (crude) than the rest of Massachusetts, for both males and females from the ages of under 5 to 34 years. Springfield has a higher rate of asthma hospitalization among the three cities.

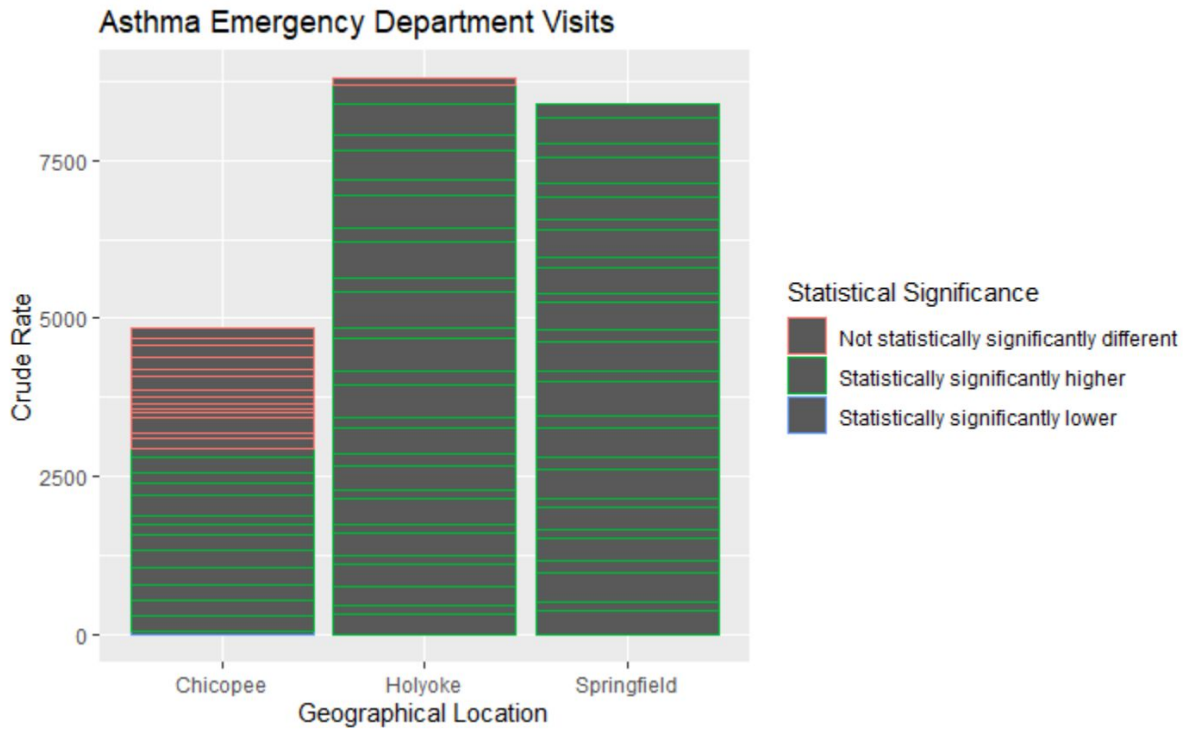


Figure 2.2: Asthma Emergency Department Visits by crude rate

All three cities have significantly higher asthma related emergency department visit rates(crude) than the rest of Massachusetts, for both males and females from under 5 years to 34 years of age. Holyoke has a higher rate of emergency department visits among the three cities.

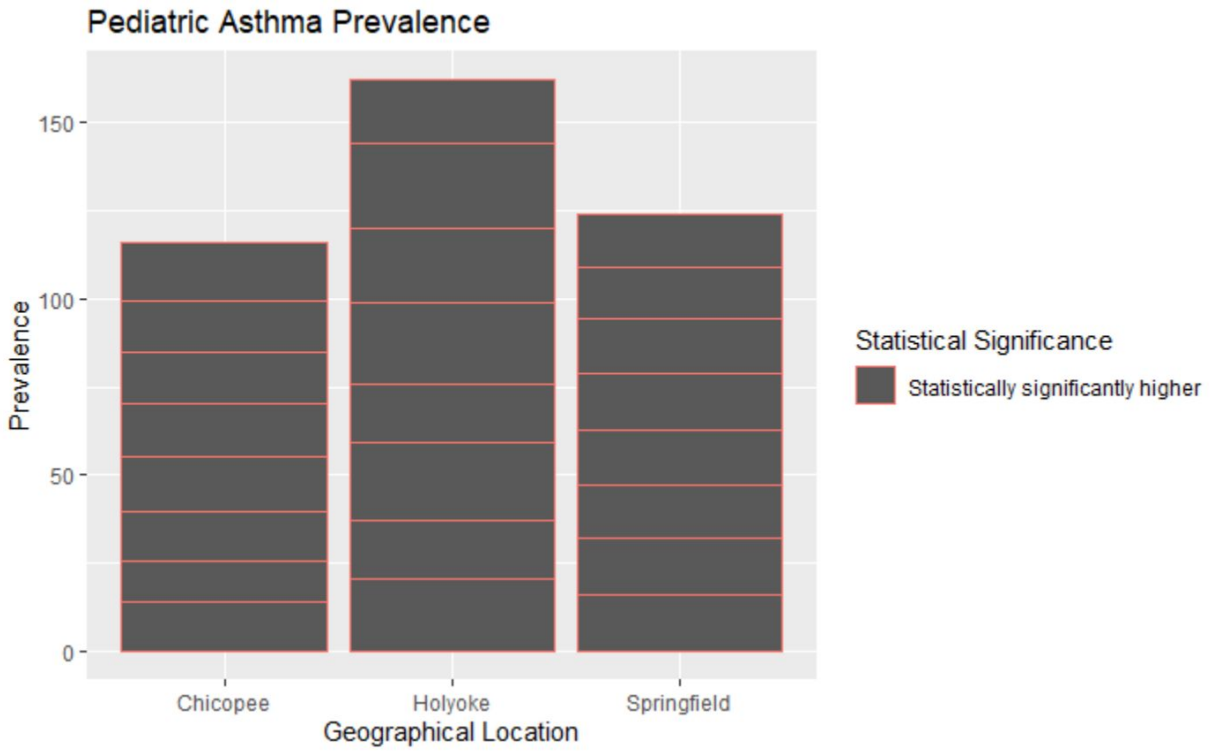


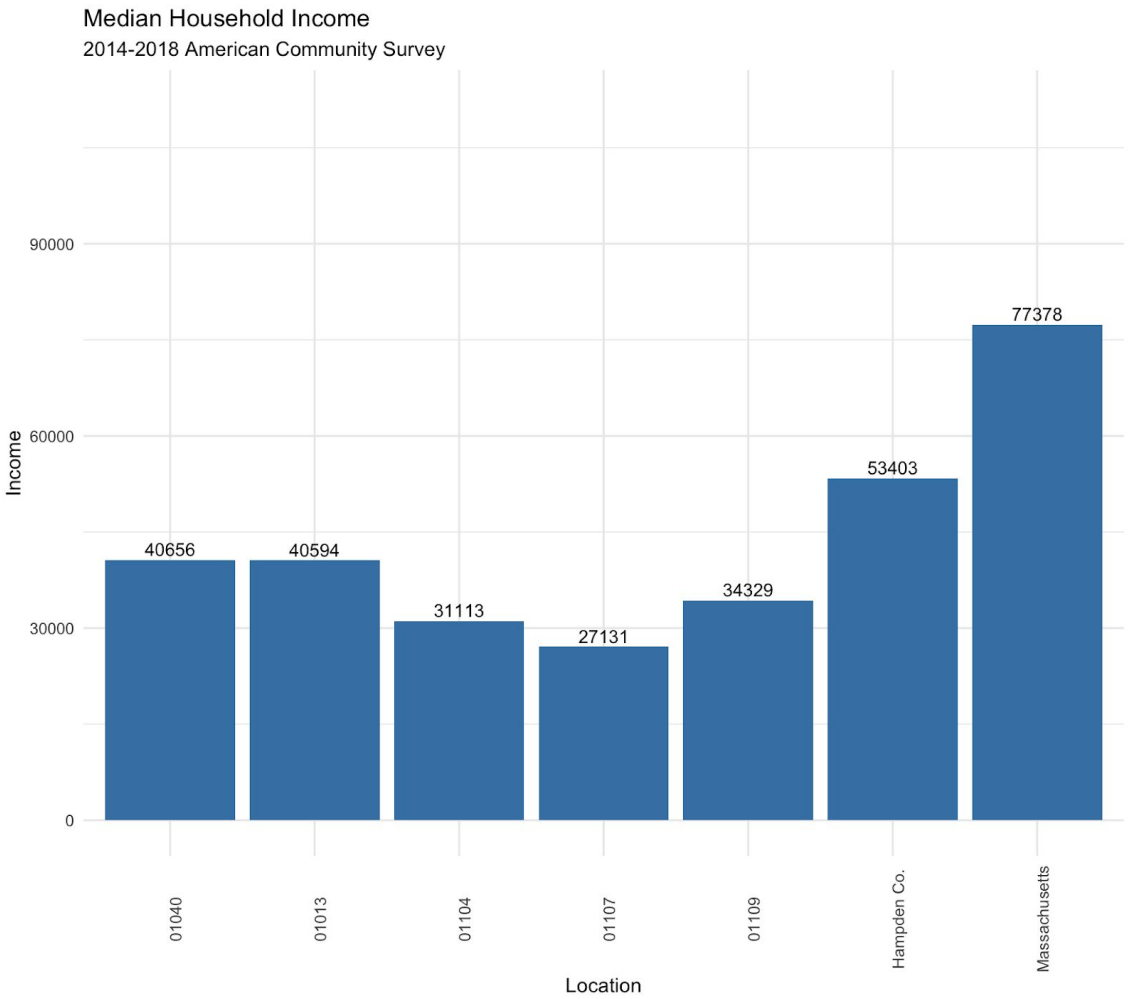
Figure 2.3: Pediatric Asthma Prevalence

All three cities have significantly higher pediatric asthma prevalence in kindergarten to 8th grade students (females aged 5 to 14 years), as compared to the rest of Massachusetts. Holyoke has a higher pediatric asthma prevalence among the three cities.

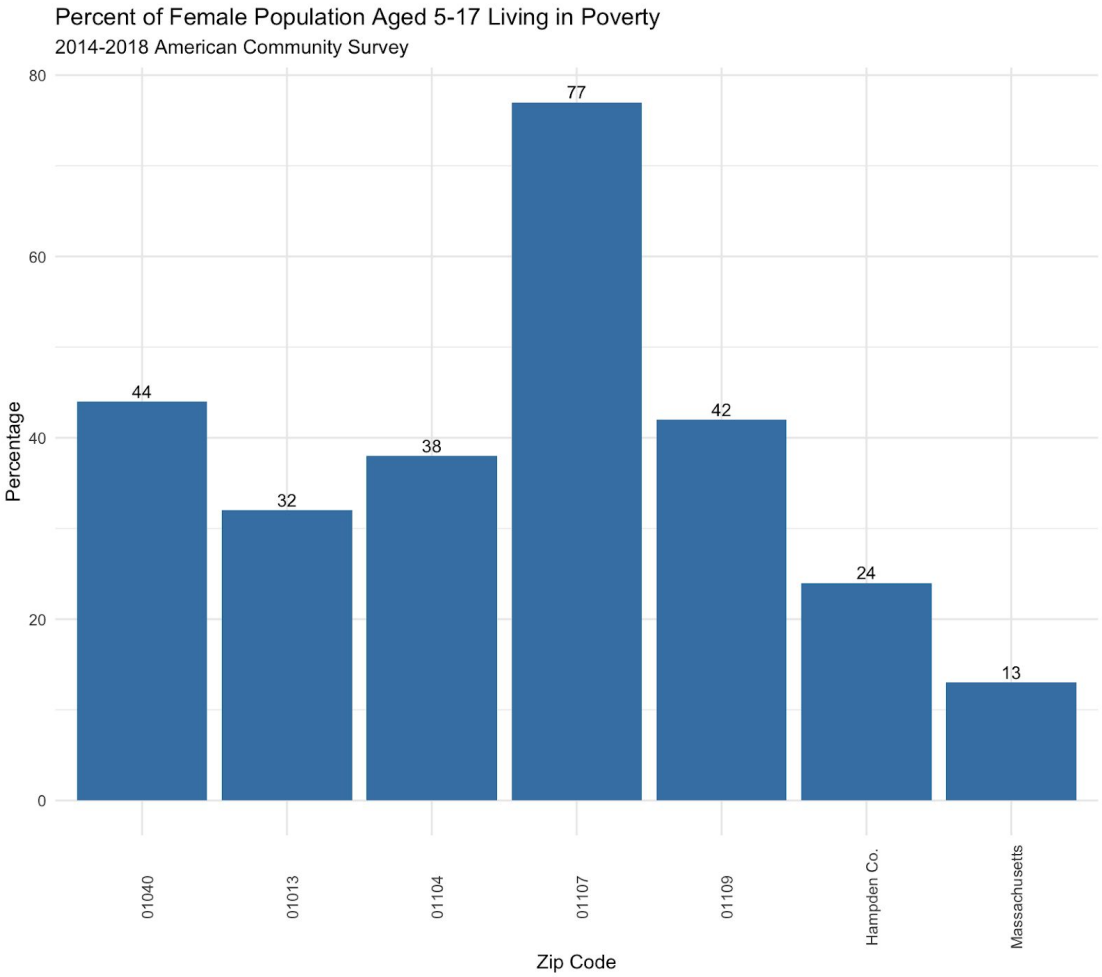
Robin Joyce

Median Household Income and Female Poverty Rates From 2014 - 2018

The data is sourced from the US Census American Community Survey 5-Year Data. The data was filtered to the zip codes from which 79% of Girls Inc. members hailed (01040, 01013, 01104, 01109, 01107), composing most of the cities Holyoke, Chicopee, and Springfield. Zip code areas with less than 20 Girls Inc. members were excluded from visualizations for clarity. Two datasets are provided: median household income of the five zip codes compared to the rest of Hampden County and Massachusetts, and female poverty rates for populations aged 5-17 of the five zip codes compared to the rest of Hampden County and Massachusetts. While historic redlining data could not be found, this data provides insight into the lasting impacts of redlining in the area.



All five zip codes representing a majority of Girls Inc. members have a considerably smaller median household income than the rest of Hampden County and Massachusetts. The zip codes belonging to Springfield (01104, 01107, 01109), representing 31% of Girls Inc. members, have the smallest median household income.



All five zip codes representing a majority of Girls Inc. members have a considerably higher rate of female poverty among those aged 5-17 than the rest of Hampden County and Massachusetts. The Springfield zip code of 01107, representing 12% of Girls Inc. members, has the highest rate of female poverty within this age range.

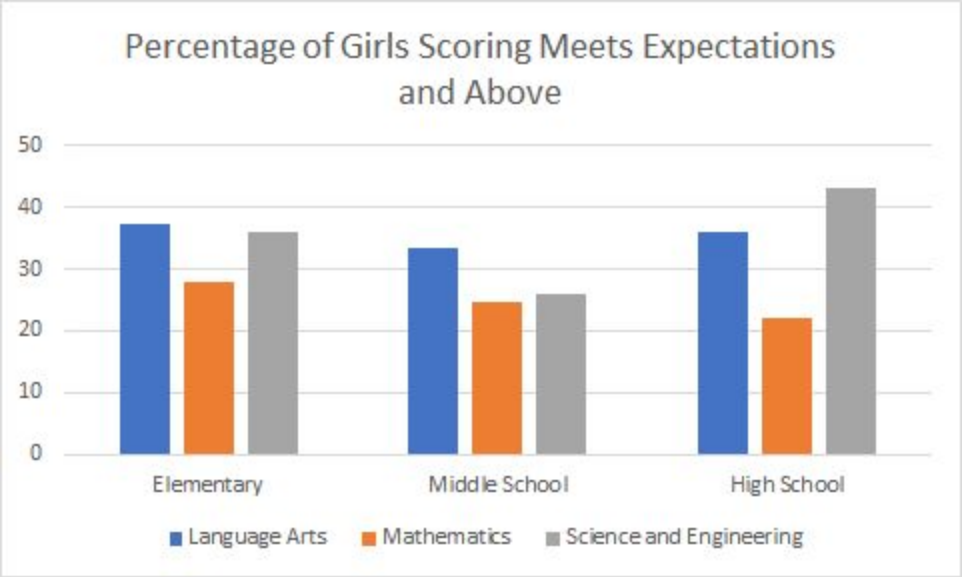
Elisabeth Eigerman

Girls' MCAS Scores in 2019 for Springfield, Holyoke, and Chicopee

The data is sourced from the Massachusetts Department of Elementary and Secondary Education's portal for school and district profiles. Looking at the reports for Springfield, Holyoke, and Chicopee the data was then filtered further for solely scores from female students.

The Massachusetts Comprehensive Assessment System or MCAS are the state mandated exams once a year for grades three through eight and once in high school for grade ten as a part of the state graduation requirement. There are four grades on the exam,

Exceeding Expectations, Meeting Expectations, Partially Meeting Expectation, and Not Meeting Expectations.



On average most girls in these districts are not meeting expectations regardless of subject matter or grade level. The math scores are particularly concerning as they illustrate not only low scores but declining scores.

Limitations

The original plan for this project was to create a map visualization to accompany the data, however we were unable to complete the visualization portion and have instead opted for static charts. The main issue in creating a visualization was finding a method which specified the Massachusetts geography down to the county level. Though there are many libraries in R which can be used to visualize states on a more broad basis, we needed to be able to map our data onto the Chicopee, Holyoke, and Springfield cities specifically. Furthermore, there was the issue of finding or making a method of visualization which could be generalized to all of our data which varied in different locational markers of the three cities – with Robin's census data using zip codes, whereas Reese and Maha's Massachusetts state data referencing the cities themselves, for example. Finally, an underlying issue with the finalization of the project was our timeline was shifted after our on-campus dismissal due to COVID-19.

Future Plans

Reese and Maha will continue working on the project through the Summer to develop a map visualization for the data. They are currently exploring different avenues, however as of right now the leaflet library of R and arcGIS seem like promising options since they are both able to specify geography down to the city level of Massachusetts.