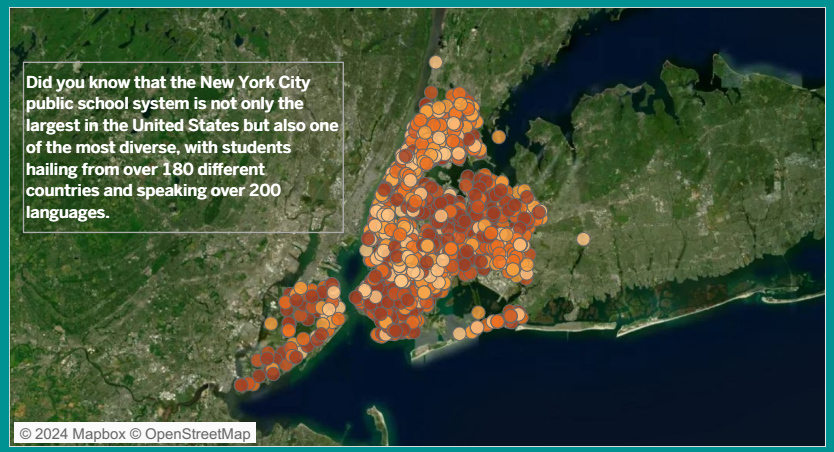
Case Study: Public School Enrollment Analysis in NYC

NYC Public School Map



Gain insights into the dynamics of the New York City (NYC) public school system, a crucial pillar of the city's educational infrastructure. Understanding enrollment trends and demographic factors is paramount for educational stakeholders, policymakers, and community members alike.

In this analysis, we delve into the multifaceted landscape of NYC's public schools to explore enrollment trends and demographic patterns across various grades and administrative districts. By examining these factors, we aim to uncover valuable insights that can inform strategic decision-making and initiatives aimed at improving educational outcomes for all students in the city.

KEY QUESTIONS:

Enrollment Trends: What are the enrollment patterns across different grades and districts in NYC schools?

Demographic Patterns: How do demographics vary across elementary, middle, and high school grades, and what's the correlation with academic success?

Strategic Insights: How can demographic analysis inform strategies to improve educational outcomes citywide?

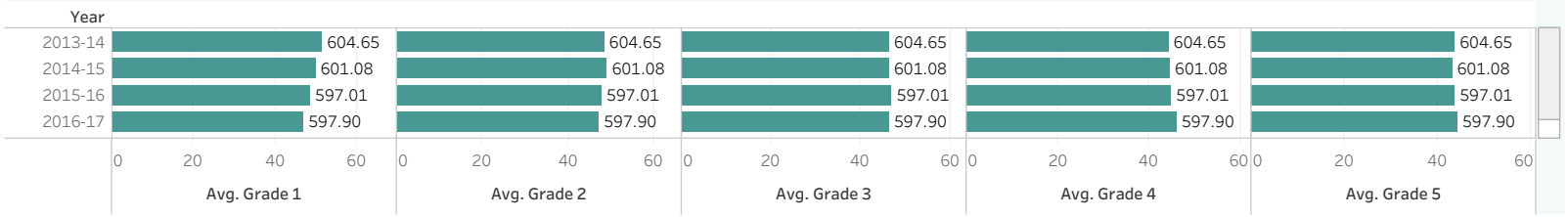
Schoolname

- Null
- 47 THE AMERICAN SI..
- 51 AVENUE ACADEMY..
- A. PHILIP RANDOLPH ..
- ABRAHAM LINCOLN H..
- Academic Leadership ..
- ACADEMY FOR CAREE..
- ACADEMY FOR COLLE..
- ACADEMY FOR CONSE..
- ACADEMY FOR ENVIR..
- ACADEMY FOR HEALT..
- ACADEMY FOR LANG..
- ACADEMY FOR NEW A..
- ACADEMY FOR PERSO..
- ACADEMY FOR SCHOL..
- ACADEMY FOR SOCIA..
- ACADEMY FOR YOUN..
- ACADEMY OF AMERIC..
- ACADEMY OF APPLIE..
- ACADEMY OF BUSINE..
- ACADEMY OF ENVIRO..
- ACADEMY OF FINANC..
- ACADEMY OF HOSPIT..
- ACADEMY OF INNOVA..
- ACADEMY OF INNOVA..
- ACADEMY OF MEDICA..

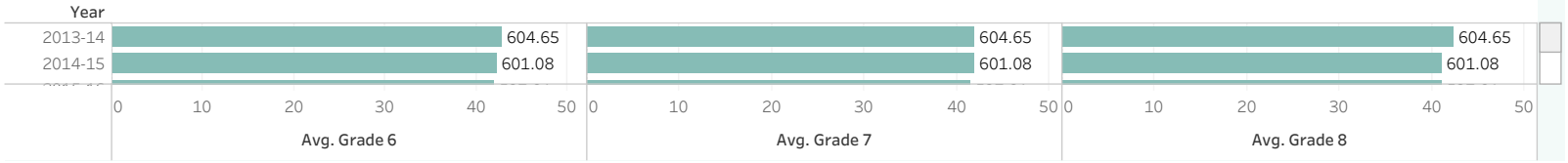
Total Enrollment

100 5,000

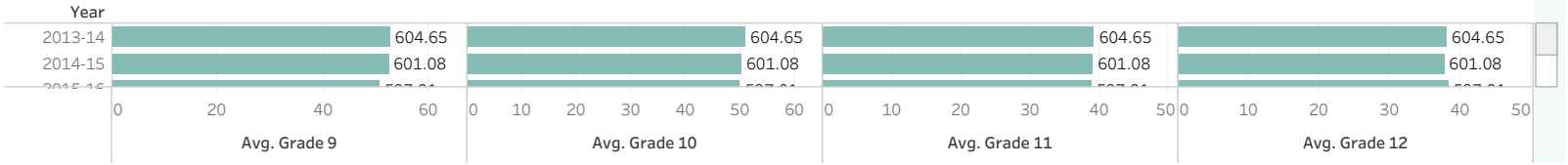
Elementary school



Middle school



High school



a) Some districts exhibit notably higher average enrollments, indicating potential differences in student population and resource demands

b) Varied enrollment levels across grade levels, with higher enrollment typically seen in lower grades in a Elementary school cohort compared to higher grades in a High school cohort.

c) Fluctuations in enrollment over time, potentially influenced by demographic changes, educational policies, and socioeconomic conditions

Linear Regression By Demographics

The map provides an overview of demographic trends including poverty rates, students with disability, and english language learners across school districts enrollment, showcasing areas with varying levels of socio-economic disadvantage. It reveals both high concentrations of poverty and areas with lower poverty rates, offering insights into socioeconomic disparities within the city.

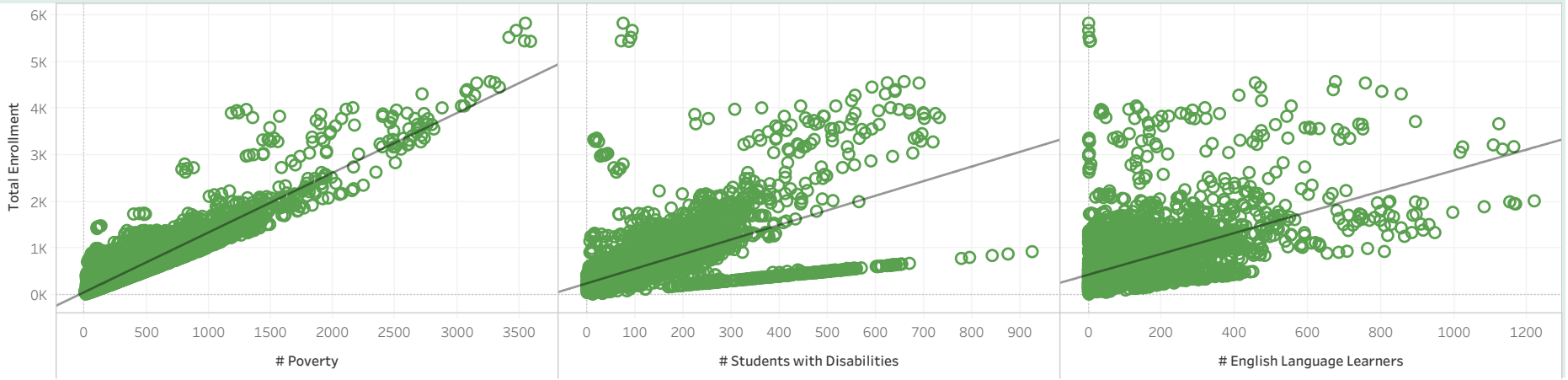
We begin to explore factors that may be correlated with public school enrollment. The expectation of finding to find a linear dependence between average enrollment and students with disability and english language learners among public school districts, suprisingly showed no linear dependence.

However, we can see in the first scatterplot a higher correlation between total enrollment and poverty. As the poverty rate increased the total amount of enrollment increases.

To test this hypothesis, we conducted a linear regression. The results showed that poverty to total enrollment only contributes to about 50% of the trend in the data. The relationship between the two variables is not entirely linear. There are many points that fall beyond the regression line. Another approach is needed to fully explain the data.

Socioeconomic Disparities: Districts with higher poverty rates face unique challenges related to student well-being, academic performance, and access to resources. High poverty rates can adversely affect educational outcomes, leading to disparities in academic achievement and graduation rates.

Linear trend



Cluster Analysis of Poverty Rate by Enrollment:

Since the linear regression wasn't enough to prove our hypothesis, a non-linear approach was needed.

Exploring a cluster analysis allows groups of data points into clusters. This way we can compare the groups of data to uncover new patterns.

The cluster analysis yielded 4 distinct groups, which you can see represented in different colors on this scatterplot - gold, light green, green, dark green.

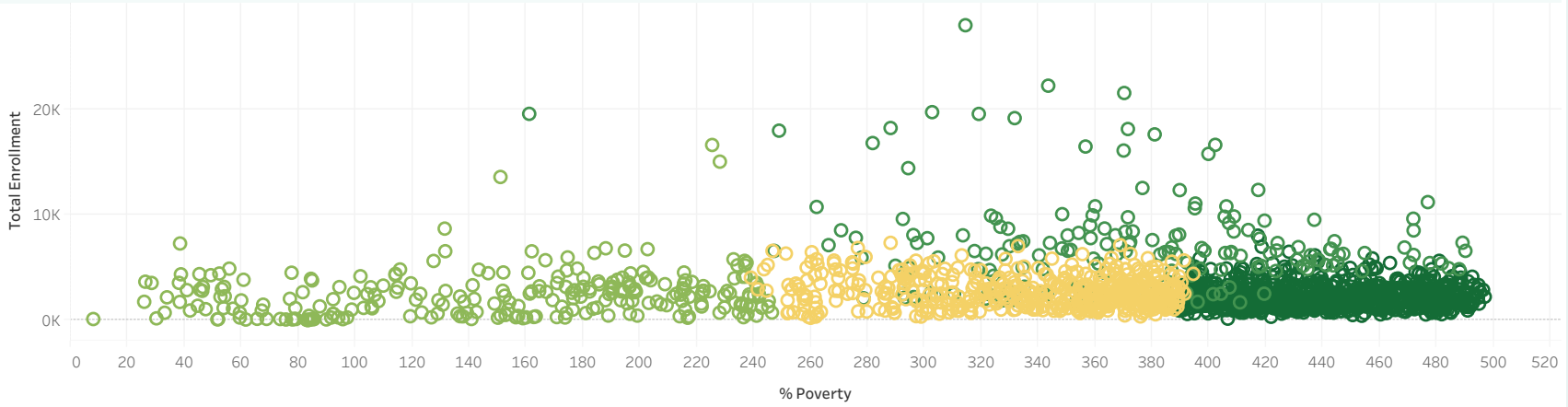
The findings suggest lower porverty areas tend to have higher enrollments, while higher poverty areas show lower enrollments.

The implications of povery influences enrollment, but other factors like location and community demographics also play a role. Understanding these dynamics is crucial for targeted interventions to address enrollment disparities and support diverse student needs.

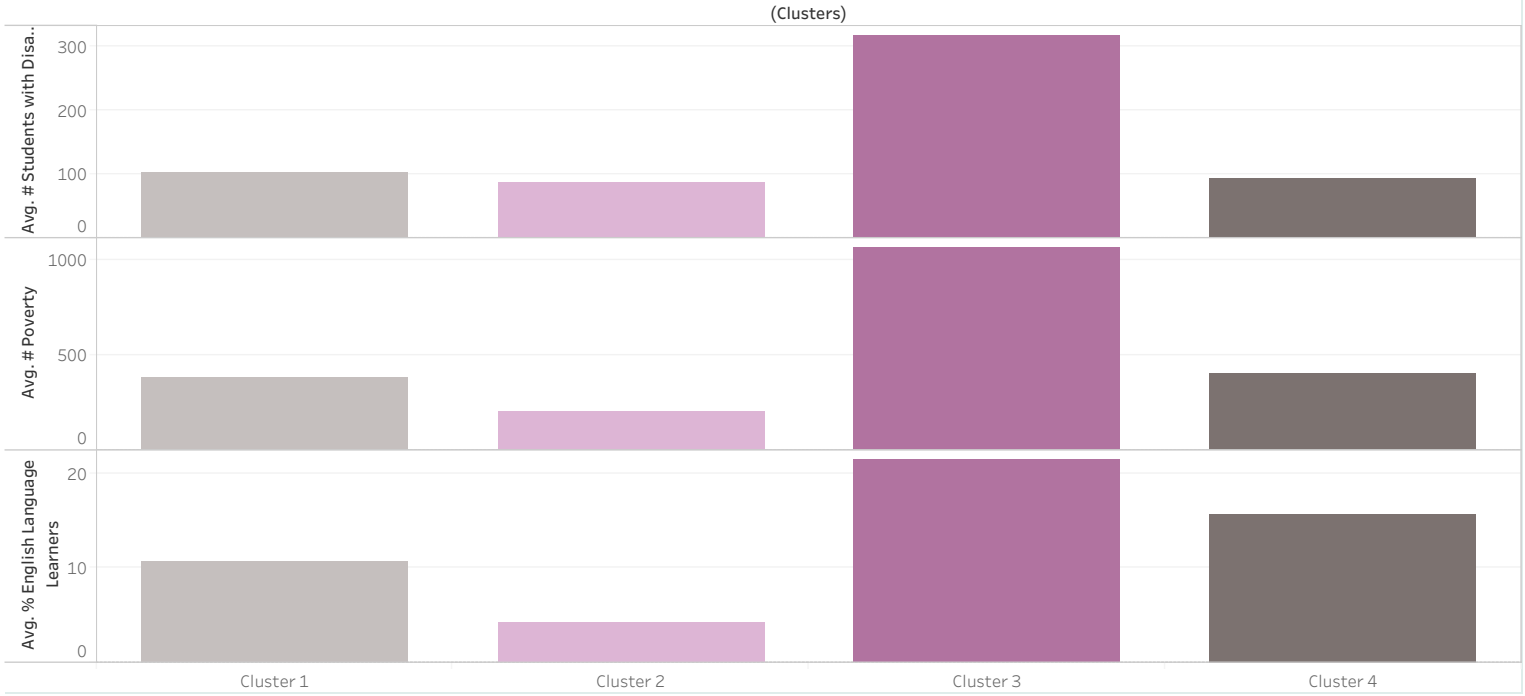
Overall, the analysis highlights the complex interplay between economic need and enrollment, emphasizing the importance of holistic approaches to educational equity and access.

Clusters
- Cluster 1
- Cluster 2
- Cluster 3
- Cluster 4

Poverty among total enrollment cluster



Difference between clusters

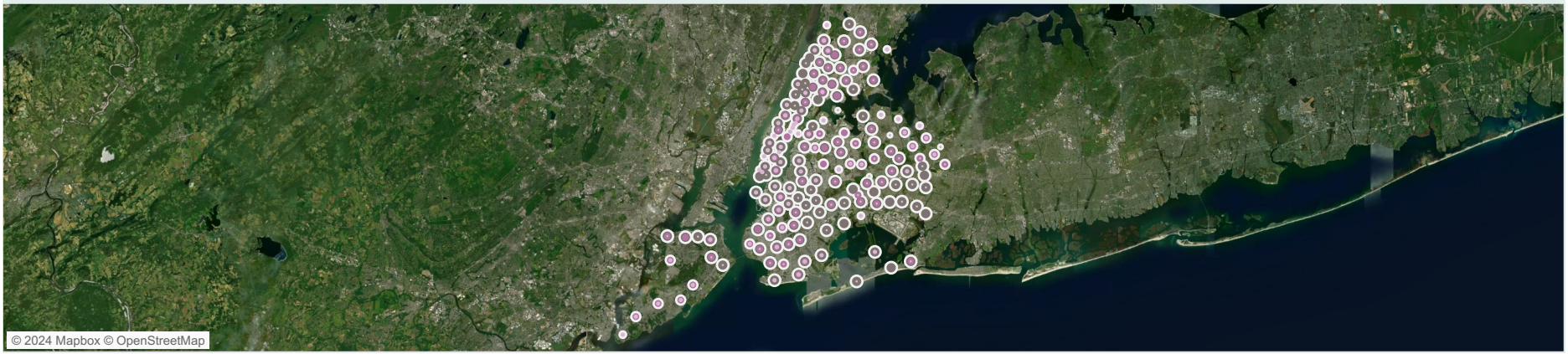


(Clusters)

- [x] Cluster 1
- [x] Cluster 2
- [x] Cluster 3
- [x] Cluster 4

The subgroup analysis by cluster indicates significant variations in socio-economic indicators and enrollment metrics.

Among the clusters, "purple" emerges as particularly noteworthy, characterized by the highest percentage of english language learners, poverty rate, and students with disabilities, despite having the lowest total enrollment. In contrast, cluster "light purple" exhibits the highest total enrollment but comparatively lower levels of demographic characteristics. Clusters "grey" and "dark grey" fall somewhere in between, showing moderate economic need and poverty rates, with "black" demonstrating a higher proportion of English language learners. These findings underscore the necessity for tailored interventions suited to the unique socio-economic contexts an..



Results:
Enrollment Disparities: Significant differences in student enrollment were observed across various school districts, indicating diverse student populations and potentially different resource needs.
Grade-Level Variations: Enrollment varied noticeably across different grade levels, with higher enrollment typically seen in lower grades compared to higher grades. This suggests varying demands for educational services among grade levels.
Temporal Fluctuations: Fluctuations in enrollment over time were noted, likely influenced by factors such as changes in population demographics, educational policies, and socioeconomic conditions.

Limitations of the Analysis:
Data Completeness: The analysis may be limited by incomplete or inaccurate data, which could affect the accuracy and comprehensiveness of the findings.
Scope of Variables: The analysis focuses primarily on enrollment trends and demographic patterns, p..

Next Steps:

Resource Allocation: Insights from the analysis guide resource allocation to areas with the greatest need, such as those with high poverty and low enrollment, where additional support can ensure equitable opportunities for all students.
Quality Enhancement: Focus on improving educational quality and individualized learning experiences in areas with high enrollment but lower poverty, optimizing learning for better outcomes.
Predictive Planning: These findings aid in predicting future enrollment trends, enabling proactive resource allocation and strategic planning for effective education delivery.
Continuous Evaluation: Emphasize the importance of ongoing evaluation to assess intervention effectiveness and make necessary adjustments, ensuring improved educational outcomes for all students.