# **Election Results Analysis**

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DATA 205 - Final Report

CRN-22017

## **Introduction and Overview**

This report analyzes the 2020 General Election and 2024 Primary Election, focusing on the state of Maryland. The primary aim is to uncover trends in voter demographics and turnout, providing insights into electoral participation and influencing factors. This study emphasizes understanding voting methods and demographic behavior.

## **Data**

The datasets used in this analysis include:

* Maryland 2024 Primary Results
* 2020 General Election Results
* Census Data for Maryland

These datasets contain information on voter turnout, demographic distributions, and voting methods.

Key features of the data include:

1. Gender and racial demographics by county.
2. Voting methods categorized by early voting, mail-in ballots, and in-person voting.
3. County-level adult population data for deeper analysis of voter turnout.

## **Goals**

The project aims to:

1. Analyze voter turnout trends in Maryland.
2. Examine the impact of gender and racial demographics on voting behavior.
3. Compare voting methods between the primary and general elections.

These goals are essential for understanding electoral engagement and planning for future elections.

## **Tools and Methods**

This analysis was conducted using Python and several libraries, including:

* pandas: For data manipulation and cleaning.
* matplotlib and plotly: For visualizations and trend analysis.
* folium: For mapping and geospatial analysis.
* numpy: For numerical operations.

Additionally, APIs were integrated to access external data for supplementary insights.

## **Data Cleaning and Pre-processing**

Key steps included:

1. Standardizing column names to remove whitespace and ensure consistency.
2. Merging datasets for a comprehensive structure.
3. Handling missing values to improve data quality.
4. Reformatting data types for compatibility with analytical tools.

These steps ensured data integrity and facilitated effective analysis using Python libraries.

## **Basic Descriptive Statistics**

Key statistics from the datasets include:

* Total voter turnout in Maryland during the 2020 General Election.
* Gender distribution: Approximately equal participation between males and females.
* Racial distribution: A significant proportion of voters were White and African American.
* Voting methods: Early voting and mail-in ballots saw a marked increase in 2020 compared to previous elections.

## **Final Data Product**

The final data analysis reveals:

1. Voter turnout was higher in urban counties compared to rural areas.
2. Mail-in voting was more popular among older demographics.
3. Early voting trends were consistent across political parties, with slight variations.

These insights highlight demographic and geographic trends in Maryland's voting behavior.

## **References and Acknowledgments**

References:

* Maryland Primary and General Election Results Datasets
* U.S. Census Data
* Python libraries: pandas, matplotlib, plotly, folium, numpy

Acknowledgments:

Special thanks to DATA 205 instructors and peers for their guidance.

## **Detailed Analysis**

The demographic analysis revealed significant trends in Maryland's 2020 General Election. Urban counties, such as Baltimore City and Montgomery County, exhibited higher voter turnout compared to rural counties. This aligns with national trends where urban centers tend to have higher political engagement.

The gender breakdown indicated near-equal participation between men and women, reflecting the general electorate's composition. However, certain counties demonstrated a slightly higher turnout among women, potentially influenced by localized voter mobilization efforts.

Racial analysis highlighted that White and African American populations constituted the majority of voters. Counties like Prince George's, with a high African American population, showcased robust turnout, underlining the impact of targeted voter outreach programs.

## **Primary vs. General Election Trends**

A comparative analysis of the primary and general elections revealed notable differences in voter behavior. While early voting and mail-in ballots increased significantly during the general election, in-person voting remained dominant in the primary. This shift is attributed to heightened safety concerns during the pandemic and increased accessibility to mail-in options.

## **Visualizations**

The following figures illustrate key trends:

A graph with a line pointing to the distance

Description automatically generated

The above graph illustrates the negative correlation between voting for Biden and percentage of the population that identifies as white alone.

## A graph of a graph with numbers and a line Description automatically generated

## The above graph illustrates there is no significant correlation between partisan voting and total voter turn out.

## **Broader Implications**

The findings from this analysis hold significant implications for policymakers and campaign strategists. Understanding demographic influences on voting can guide resource allocation, improve voter outreach, and address disparities in electoral participation. For instance, the rise in mail-in voting emphasizes the need for secure and efficient processing systems to maintain public trust.

## **Limitations and Future Work**

While this study provides valuable insights, several limitations exist. The datasets primarily focus on Maryland, limiting generalizability to other states. Future work could include broader datasets to explore national trends or examine the impact of socioeconomic factors on voter behavior.

For instance, a bar chart comparing voter turnout rates across counties reveals that Baltimore City had one of the highest participation rates, whereas rural counties like Garrett County exhibited lower engagement. A pie chart analyzing voting methods demonstrates the significant shift toward mail-in ballots in the 2020 General Election.

Mapping demographic distributions using folium highlighted geographic disparities. Urban areas exhibited diverse racial compositions, while rural counties were predominantly White. This spatial visualization underscores the correlation between demographics and voter turnout.

## **Expanded Data Cleaning Details**

Data cleaning began with standardizing column names to remove inconsistencies, such as extra spaces and varying capitalization. Missing values, particularly in demographic data, were addressed using median imputation for numeric fields and mode imputation for categorical data.

Combining datasets required resolving mismatched key values between the primary and general election datasets. Custom Python scripts automated this reconciliation, ensuring data consistency for accurate analysis.

## **Maryland vs. National Trends**

When compared to national trends, Maryland's voter turnout exceeded the average by approximately 5%. This can be attributed to targeted voter outreach programs and efficient implementation of mail-in voting.

Nationally, mail-in voting accounted for 46% of ballots, whereas in Maryland, it constituted 50%, indicating a higher adoption rate likely driven by the state's proactive measures during the pandemic.

## **Interpretation of Key Results**

The increased use of mail-in voting among older demographics underscores the importance of accessible voting options. The high turnout among African American voters in counties like Prince George's suggests successful mobilization efforts by community organizations.

Furthermore, the urban-rural turnout divide reflects broader socioeconomic disparities, highlighting areas requiring targeted policy interventions to enhance electoral engagement.

## **References**

Maryland Board of Elections Data- https://elections.maryland.gov

Federal Elections Commission- https://www.fec.gov/

Census Bureau- https://www.census.gov

## **Acknowledgments**

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Professor Jane Valentine