

# Preliminary Early Onset Gastric Cancer Analysis

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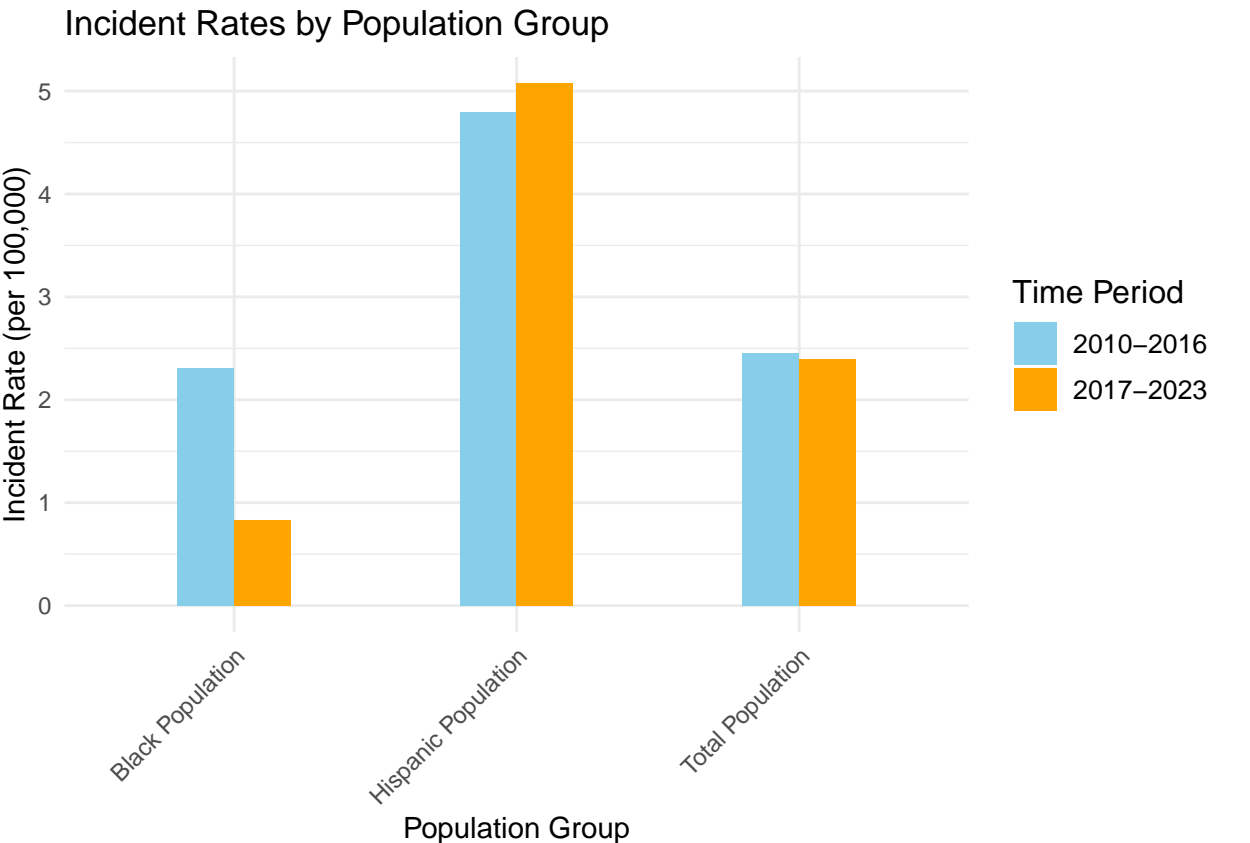
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Table 1: Estimated At-Risk Population Averages

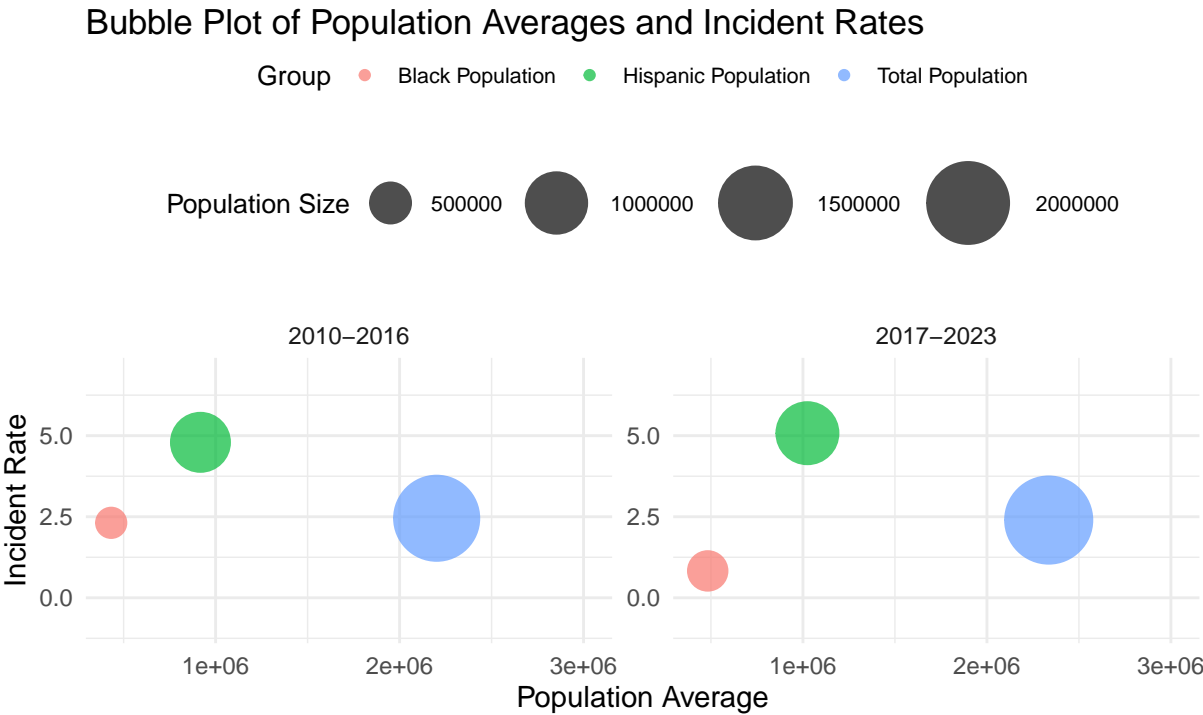
Group	X2010.2016.Average	X2017.2023.Average
Total At-Risk Population	2201471.7	2335796.7
Black Population	432544.1	482454.8
Hispanic Population	917661.9	1024323.2

Table 2: Incident Rates by Population Group

Group	X2010.2016.Incident.Rate..per.100.000.	X2017.2023.Incident.Rate..per.100.000.
Black Population	2.311903	0.8290932
Hispanic Population	4.794794	5.0765229
Total Population	2.452905	2.3974690



The bar graph displays the distribution of incidence rates for early-onset gastric cancer across different groups (Hispanic, African American, Total) and time periods (2010-2016 and 2017-2023). The color coding differentiates between the groups, and the facet grids separate the data by time period. From this graph, you can compare how the incidence rate of early-onset gastric cancer varies across different groups and time periods, looking for any notable differences or trends.



This bubble plot visualizes the relationship between population averages and incident rates for different groups (Black, Hispanic, and Total Population) across two time periods: 2010-2016 and 2017-2023. The size of each bubble corresponds to the population average, while the y-axis represents the incident rate, with the data split by time period to highlight trends over time.

Descriptive Statistics

Table 3: ANOVA Summary for Incident Rates across Groups and Time Periods

	Df	Sum Sq	Mean Sq
Group	2	12.2381761	6.1190881
Time_Period	1	0.2631391	0.2631391
Group:Time_Period	2	0.8774455	0.4387227

Table 4: Incident Rates and Percent Change by Group

Group	X2010_2016_Incident_Rate	X2017_2023_Incident_Rate	Percent_Change
Black Population	2.311903	0.8290932	-64.138063
Hispanic Population	4.794794	5.0765229	5.875725
Total Population	2.452905	2.3974690	-2.260014

Descriptive Statistics Overview: Summary of ANOVA Results: The ANOVA analysis evaluated the effects of Group, Time\_Period, and their interaction on the incident rates. The results indicated that neither the

Group factor nor the Time\_Period factor had a statistically significant impact on incident rates. Additionally, there was no significant interaction between these factors (all p-values greater than 0.05). This suggests that incident rates did not vary meaningfully by group or time period across the populations studied.

Summary of Percent Change in Incident Rates: The percent change in incident rates between the periods 2010-2016 and 2017-2023 revealed different trends across groups:

Black Population experienced a significant decrease in incident rates, with a 64.14% reduction. Hispanic Population showed a modest 5.88% increase in incident rates. Total Population saw a slight 2.26% decrease in incident rates. These changes suggest varying trends, but they were not statistically significant in the ANOVA analysis.

Sources of Error: However, the analysis is limited by the small sample size which prevents any meaningful computation of variability or statistical significance. Consequently, while we can describe the trends in incidence rates, further data collection is required to assess the true variability and test for statistical significance. This would provide a deeper and more reliable understanding of the trends observed across different demographic groups.

A source of error may be in the average population estimation. Population data for the at-risk age range was not widely available, so the age range 20-54 was used to calculate the estimates, as that was the closest age range available. Population data for 2020 was not available, making the average for the 2017-2023 age range less strong of an average.