**Analysis of Regional Colon Cancer Diagnosis Trends (2005-2022): Age, Sex, and Race Factors**

For our project, we have chosen to study regional colon cancer diagnoses over time, by age, sex, and race. The data provided, which was retrieved from the National Cancer Institute’s SEER database, covers regional colon cancer cases between 2005 and 2022. Before analyzing the data, our hypothesis was that colon cancer (excluding rectum cancer) rates have increased over time in the US, despite the ongoing advancements in modern medicine. Additionally, we aimed to explore whether there is any correlation between regional colon cancer rates and factors such as sex and race.

**Trend of Regional Cancer Diagnosis Over Time:**

Our data reveals that between 2005 and 2022, the total number of documented colon cancer cases initially declined, followed by noticeable spikes in 2017 and 2022. This trend is clearly illustrated in the accompanying graph. The fluctuations observed may indicate shifts in diagnostic practices, increased screening, or changes in risk factors during these periods.

**Trend of Cancer Diagnosis by Age:**

The data is categorized by age groups, ranging from less than 1 year to 85+ years. It shows that the incidence of colon cancer increases with age, suggesting that the disease is less prevalent among younger individuals. Specifically, the diagnosis rate remains relatively stable for those between 1 and 39 years of age, with a significant rise beginning around age 40. The highest number of documented cases is observed in the 85+ age group, which is consistent with known patterns of colon cancer risk.

**Trend of Regional Cancer Diagnosis by Sex:**

The data for male and female colon cancer diagnoses show similar trends. The graphs indicate that colon cancer is not more prevalent in one sex over the other, suggesting that the disease affects both genders at comparable rates in the regions studied.

**Total Regional Cancer Diagnosis by Race:**

Our illustration depicts the regional distribution of colon cancer across three racial categories: White, Black, and Other. The line graph highlights that White individuals consistently have the highest number of diagnosed cases across all years, with cases consistently exceeding 8,000 annually. In contrast, Black individuals have the second-highest number of diagnosed cases, with their annual figures not exceeding 8,000. Other racial groups have the lowest number of diagnosed cases. This trend suggests that colon cancer is more prevalent among White individuals compared to Black and other racial groups.

**Limitations of the Study:**

While our study provides valuable insights, there are several limitations that may affect the data. One major limitation is that certain demographic groups may not undergo colon cancer screening as frequently as others, which could lead to underreporting or delayed diagnoses. For example, individuals in rural areas or those without adequate healthcare access may have fewer screenings, leading to lower reported rates. Additionally, there may be socio-economic factors that influence the likelihood of getting tested, such as lack of insurance or financial constraints. These factors could skew the data, as the diagnosis rates may not fully represent the actual incidence across all demographics. Furthermore, disparities in healthcare access or the quality of care received by different racial or sex groups could also contribute to these limitations.

**Conclusion:**

In conclusion, the data did not support our initial hypothesis that colon cancer (excluding rectum cancer) rates have increased over time in the US despite advancements in modern medicine. Rather than a general increase in colon cancer cases, the data reveals fluctuating trends with noticeable spikes in 2017 and 2022. Additionally, the incidence of colon cancer is shown to rise with age, particularly starting at age 40 and continuing through to the 85+ age group. The analysis of sex and race shows no significant disparities, with colon cancer diagnoses being relatively consistent across both genders and racial groups. This suggests that age remains the most influential factor in colon cancer risk, rather than advancements in medicine, sex, or race.