Project Document

**Heart Attack Incidence by Age Group in Germany:**

* The youth group experienced a certain number of heart attack cases.
* The adult group had a higher number of heart attacks compared to the youth group. This indicates that heart attacks are more common among adults than youths.

**Average BMI by Gender Across States:** There is minimal variation in average BMI across states or genders, with all values remaining close to 25.

**Top 5 States with Highest Youth Heart Attack Incidence Rates:**

* Hesse has the highest number of youth heart attack cases.
* Berlin follows closely, with slightly fewer cases.
* Saxony, Bavaria, and Baden-Württemberg report similar, slightly lower incidences compared to Hesse and Berlin.

**Heart Attack Incidence: Urban vs. Rural Areas:** Rural areas report a marginally higher number of heart attack cases than urban areas, suggesting that heart attacks are somewhat more frequent in rural settings.

**Average Heart Attack Incidence by Socioeconomic Status:**

* There is little variation in heart attack incidences across socioeconomic groups.
* The incidence is slightly lower among those with high socioeconomic status, with middle and low groups showing minimal differences. This suggests that socioeconomic status has little impact on heart attack incidences.

**Year with the Highest Adult Heart Attack Incidence:** 2017 had the highest number of adult heart attack cases, totaling 4686.

**Regional Comparison of Youth and Adult Heart Attack Rates:**

* Rural areas show slightly higher heart attack rates for both youth and adults compared to urban areas.
* Adults experience the highest incidence rates in both rural and urban settings.

**Percentage of Smokers with Heart Attacks Across Age Groups:** 10.01% of smokers have experienced a heart attack.

**Physical Activity in States with Below-Average Heart Attack Rates:**

* Bavaria, Lower Saxony, and North Rhine-Westphalia have below-average heart attack rates.
* Among these, Bavaria has the lowest heart attack rate.

**Alcohol Consumption Above National Average:**

* Alcohol consumption exceeded the national average in all the listed years, with values being close to each other.
* 2017 recorded the highest average alcohol consumption, while 2018 had the lowest.

**Average Stress Levels in States with the Highest Air Pollution Indices:**

* Hamburg reports the highest average stress level, followed by Berlin.
* North Rhine-Westphalia, Baden-Württemberg, and Bavaria show slightly lower stress levels, but their values are quite similar.

**Cholesterol Levels by Education Level:**

* People with Primary education have the highest average cholesterol levels, followed by those with Secondary and Tertiary education.
* The differences in cholesterol levels between education groups are small.

**Heart Attack Rate in Regions with Above-Average Healthcare Access:** Heart attack rates are fairly similar in both rural and urban areas, with rural areas having slightly lower average rates.

**Heart Attack Incidence by Socioeconomic Status in Urban vs. Rural Areas:**

* The low socioeconomic status group experiences higher heart attack incidences in rural areas compared to urban areas.
* The middle and high socioeconomic groups show similar patterns across urban and rural areas.

**Most Common Diet Quality Rating Among Youth with Heart Attacks:** The most common diet quality rating for youth experiencing heart attacks is "Average."

**States with Year-Over-Year Heart Attack Rate Increases for Three Consecutive Years:**

* Baden-Württemberg and Bavaria have shown a general increase in heart attack incidences over consecutive years.
* States like Hamburg, Hesse, and Saxony also show a similar trend.

**Physical Activity by Employment Status:**

* Unemployed individuals show the highest average physical activity, while employed individuals score slightly lower.
* Retired and student groups report similar physical activity levels, which are closer to those of the employed group.

**States with Above-National Average BMI:**

* Bavaria, Hamburg, and Baden-Württemberg have average BMIs above the national average, while Saxony has a slightly below-average BMI.

**States with Higher Youth Heart Attack Rates than Adults (Using Self-Join):** In Bavaria, the youth heart attack rate is higher than the adult rate.

**Heart Attack Incidence in Smokers vs. Non-Smokers (Using a Join):**

* Hesse has the highest incidence rate among smokers, closely followed by Saxony.
* For non-smokers, Berlin has the highest incidence rate, slightly higher than that for smokers.

**States with Higher Stress Levels and Lower Heart Attack Incidences (Using a Subquery):** Saxony, Berlin, and Bavaria have higher-than-average stress levels but lower-than-average heart attack incidences.

**Ranking States by Adult Heart Attack Incidence Rates, Partitioned by Year:**

* State rankings fluctuate yearly.
* Baden-Württemberg ranked the highest in 2021, while Saxony and North Rhine-Westphalia maintained consistent rankings over the years.
* Berlin ranked highest in 2023.

**Top 3 States with Highest Youth Heart Attack Rates Each Year (Using a Window Function):**

* Baden-Württemberg, Saxony, and Hamburg consistently had the highest youth heart attack rates in 2015.
* Other states like Lower Saxony, North Rhine-Westphalia, and Bavaria also had high rates in specific years.

**Correlation Between Air Pollution and Heart Attack Incidence Rates:** The correlation between the air pollution index and heart attack incidence rate is very weak (0.000764), indicating a minimal relationship.

**Regions with Consistent Increase in Heart Attack Rates Across All Socioeconomic Levels:** Baden-Württemberg, Bavaria, Berlin, Hamburg, Lower Saxony, and Saxony show a consistent increase in heart attack rates across all socioeconomic levels.

**Impact of Diabetes on Heart Attack Incidences for Different Age Groups:**

* Adults with diabetes have a slightly higher incidence rate compared to non-diabetics.
* For youth, the rates are nearly identical, with diabetic youth having a marginally higher rate than non-diabetic youth.

**Year-Over-Year Growth in Youth Heart Attack Incidences in Germany:**

* Incidences show some fluctuations, with 2019 seeing the highest growth percentage at 6.75%.
* In 2023, there was a decrease in incidences, although 2022 showed signs of recovery.

**Correlation Between Smoking, Alcohol, and Heart Attack Incidences:**

* The correlation between alcohol consumption and heart attack incidence is weakly negative (-0.002767), showing a minimal inverse relationship.
* Smoking status also shows an extremely weak correlation with heart attack incidence (-0.000188).

**Impact of Education Level on Physical Activity and Heart Attack Rates:**

* Individuals with Primary education tend to engage in more physical activity, while those with Tertiary education are more likely to have lower physical activity levels.
* Heart attack rates vary slightly across education levels, but the differences are not significant.

**States Where Family History Most Affects Heart Attack Rates (Controlling for Age and Gender):**

* Saxony has the greatest impact of family history on youth heart attack rates, especially among males.
* Lower Saxony and North Rhine-Westphalia also show significant family history effects in youth.

**Diet Quality and Heart Attack Rates in Adults (Using a CTE):**

* Poor and average diet quality correlate with higher heart attack rates, indicating a high-risk group.
* Good diet quality is associated with a slightly lower incidence rate, indicating a low-risk group.

**Hypertension and Cholesterol Levels’ Combined Effect on Heart Attack Incidence Rates:** People with hypertension have slightly lower cholesterol levels, yet experience a lower average heart attack rate compared to those without hypertension.

**Segmentation of Population into High-Risk and Low-Risk Groups for Heart Attacks:** The majority of the population falls into the low-risk category based on stress levels, BMI, and healthcare access, with moderate and high-risk groups being significantly smaller.