

The Correlation Between Sugar Sweetened Beverages and Cardiovascular Diseases

Thousand Oaks High School

AP Research STEM

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Introduction



#1

Cause of death

800,000

Annual deaths caused by cardiovascular disease

\$316.6 billion

In health care costs



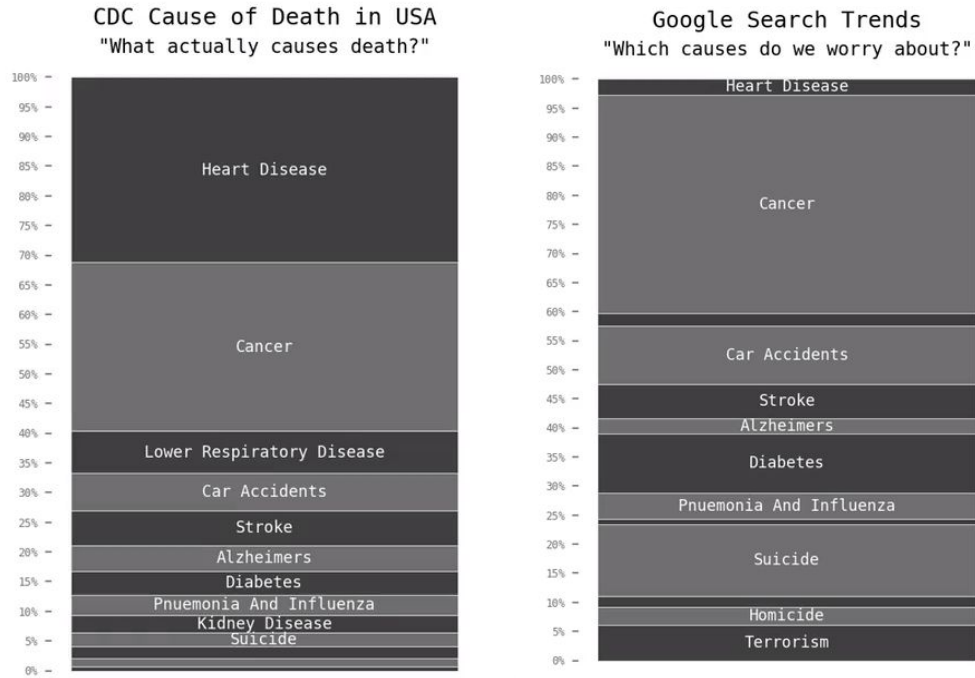


Figure 1: A comparison of causes of death in the US and the most searched for causes of death

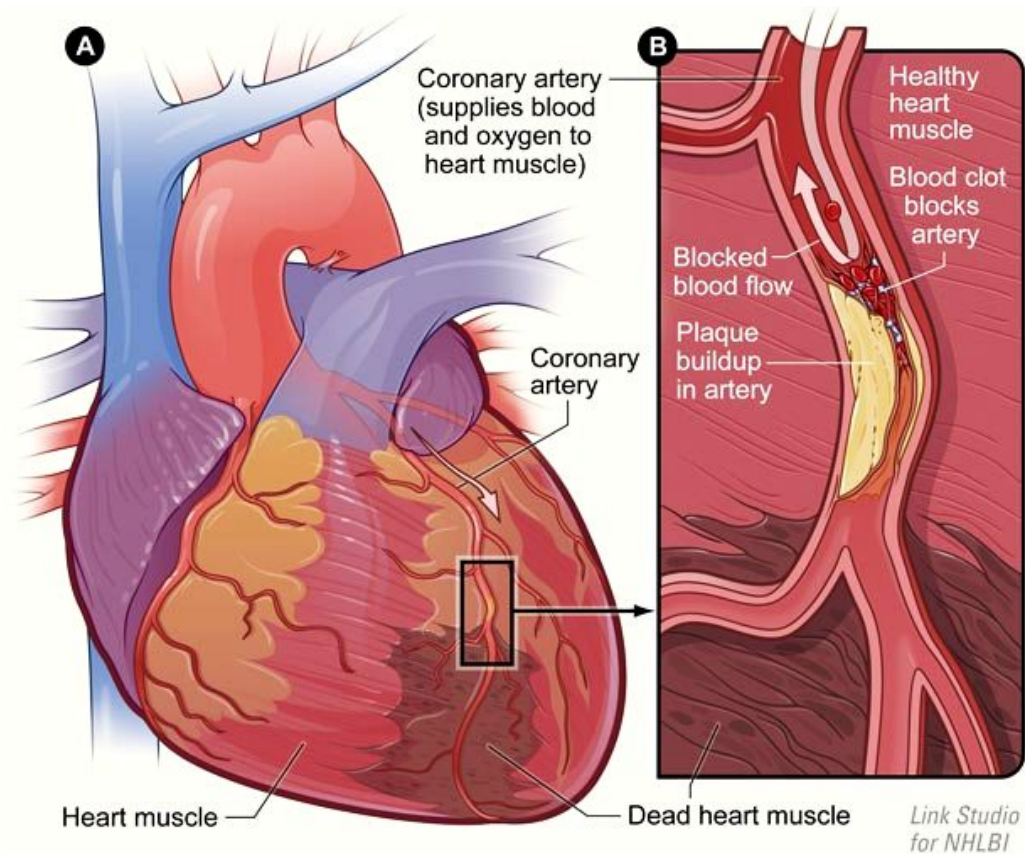


Figure 2: A buildup of plaque in arteries causes cardiovascular diseases

Factors



Figure 3: Factors that cause CVD

Saturated Fats

- Animal fats
- 5-6% recommended intake (calories)
- Increases large LDL cholesterol

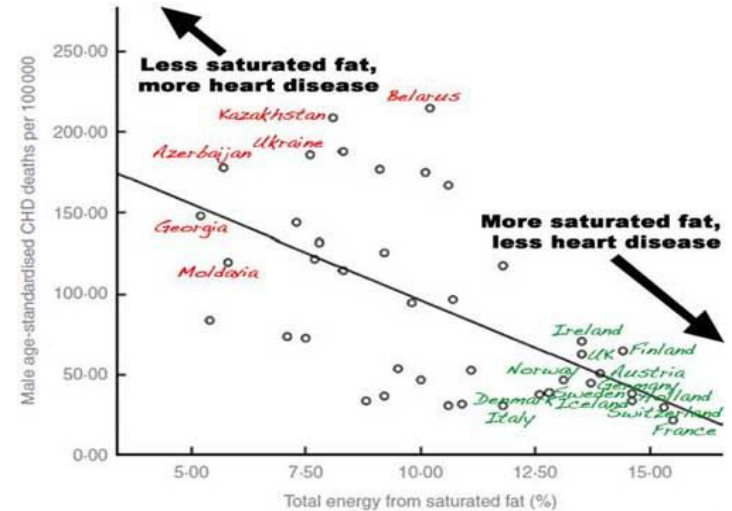


Figure 4: Increased saturated fat consumption in different countries results in lower risks of CVD

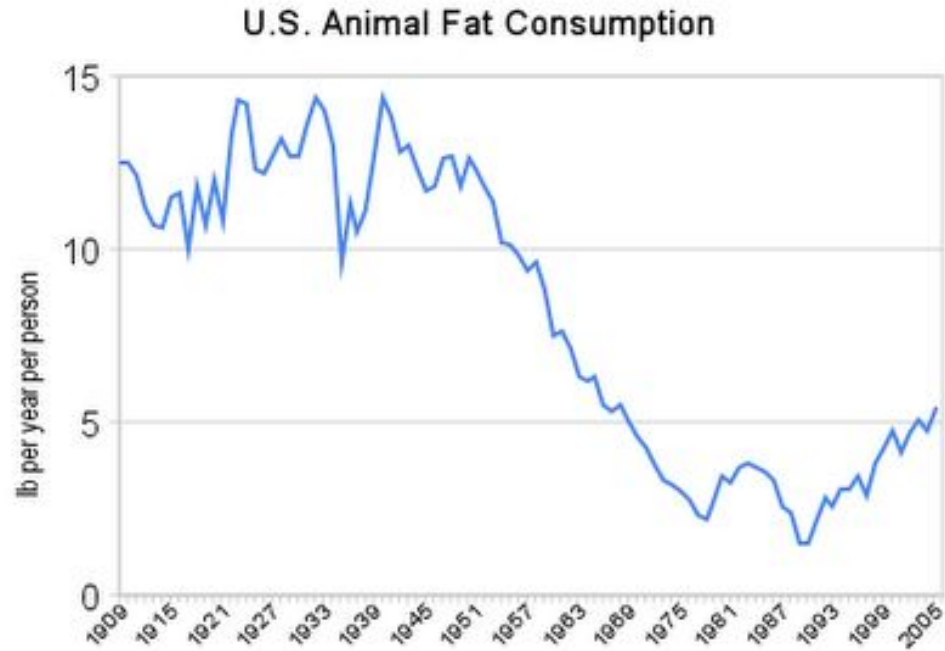


Figure 5: US animal fat consumption over time

Sugar Consumption

■ Causes:

- ▷ Obesity
- ▷ Type 2 diabetes
- ▷ Kidney diseases
- ▷ Tooth decay
- ▷ Gout

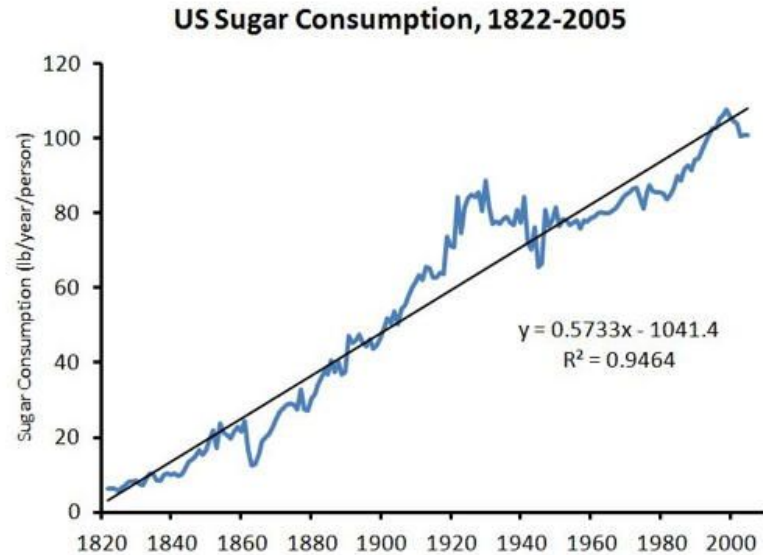


Figure 6: Increase sugar consumption in the US

Sugar Sweetened Beverages

- Recommends daily intake of 6-9 tablespoons
- Average SSB contains about 13 tablespoons
- Average person drinks 1-2 beverages per day



Figure 7: Popular SSB and their sugar contents

Sugar's Effect on the Heart

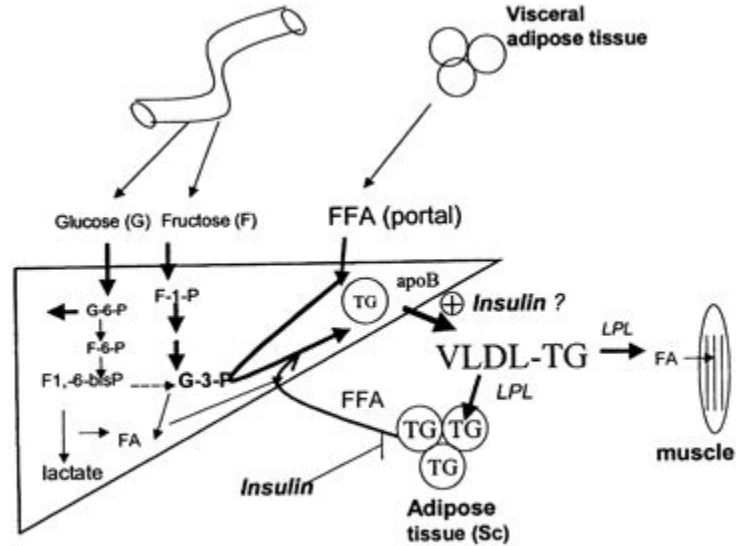


Figure 8: Interrelations of sugar and triacylglycerol (TG) metabolism

Current Solutions

- Sugar alternatives in SSB
- SSB Tax

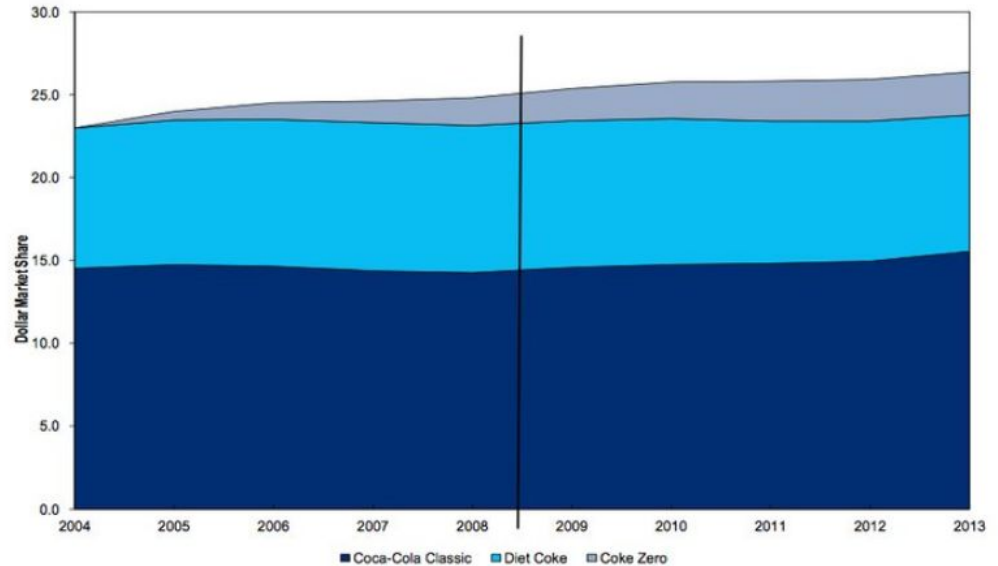


Figure 9: The market share of different Coca Cola types: classic, diet, and zero

Purpose

To understand the extent of the relationship between excessive sugar intake through SSB and CVD

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**Is there a significant correlation
between sugar consumption and
cardiovascular disease?**

Hypotheses

- ***Alternate Hypothesis:*** There is a significant correlation between cardiovascular disease and excess sugar consumption
- ***Null hypothesis:*** There is no significant correlation between cardiovascular disease and excess sugar consumption

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Methods

Process

Step 1

Current
Literature
Review

Step 2

Selection
Criteria

Step 3

Accumulated
Data by
ethnicity

Step 4

Conclusions
Discussions
Implications

Step 5

Communicate
findings

Selection Criteria

- Studies must be
 - a. Scholarly (peer reviewed) journals
 - b. Use data from a nationally represented sample (NHANES)
 - c. Sort data by ethnicity
 - d. Include participants aged ≥ 20 years

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Results

Data Set	Asians or Pacific Islanders	Non-Hispanic Whites	Hispanics	Non Hispanic Blacks	P value
Average Energy intake from SSBs (kcal/d)	70.6	158.9	173.5	197.2	<0.01
Average Energy intake from from Saturated Fats (% kcal/d)	9.7	11.7	10.2	10.1	<0.01
Age-Adjusted Death Rates per 100,000	97.6	182.7	132.7	230.4	<0.01

Table 1: SSB and SFA consumption and death rates by ethnicity

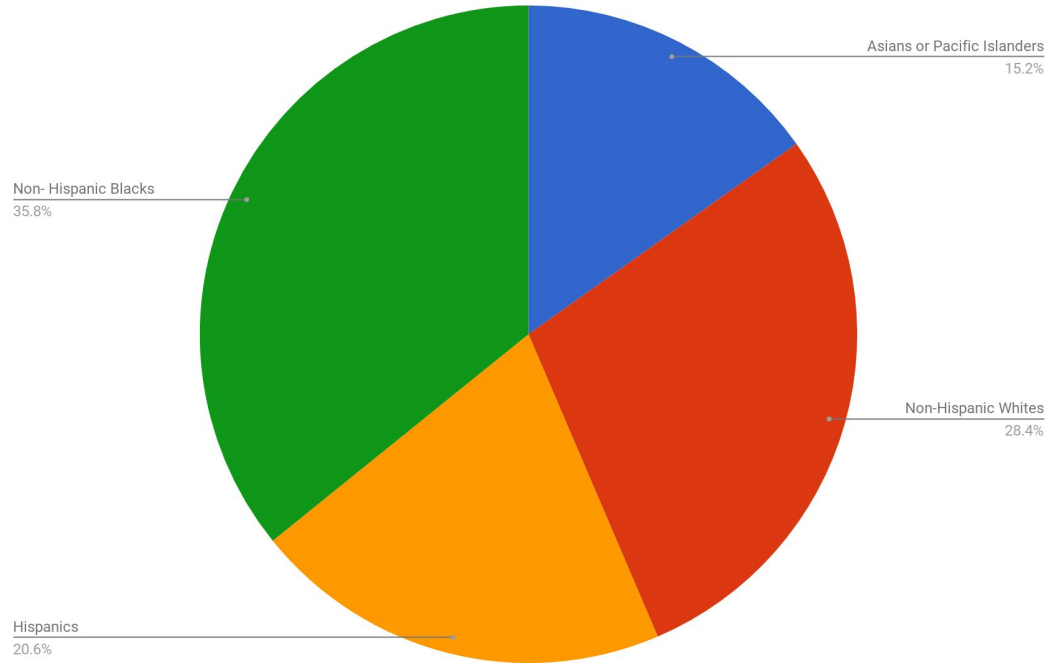
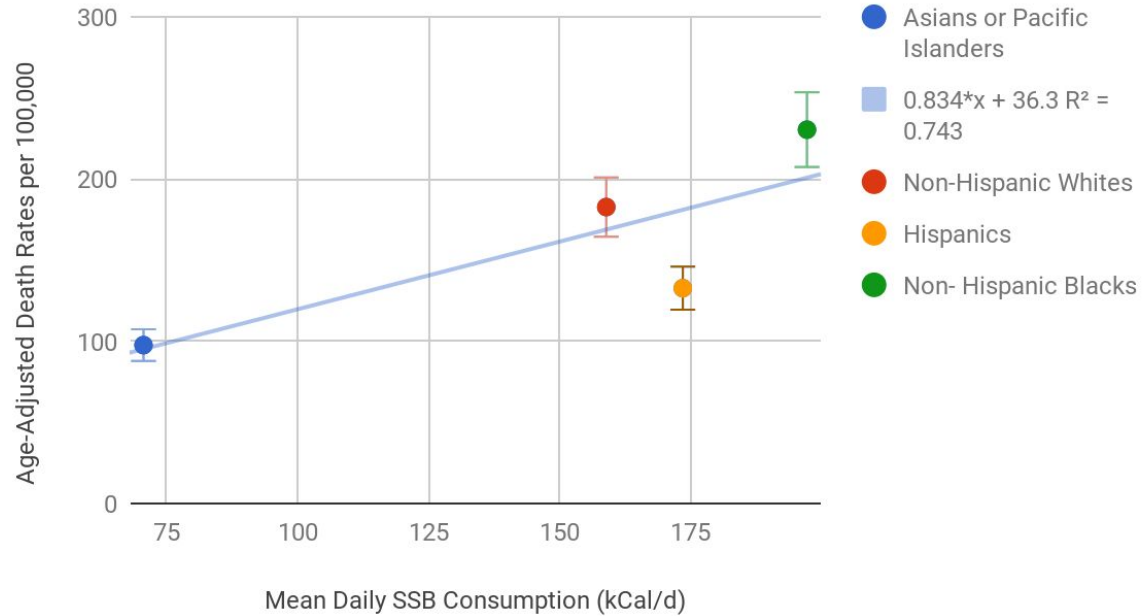


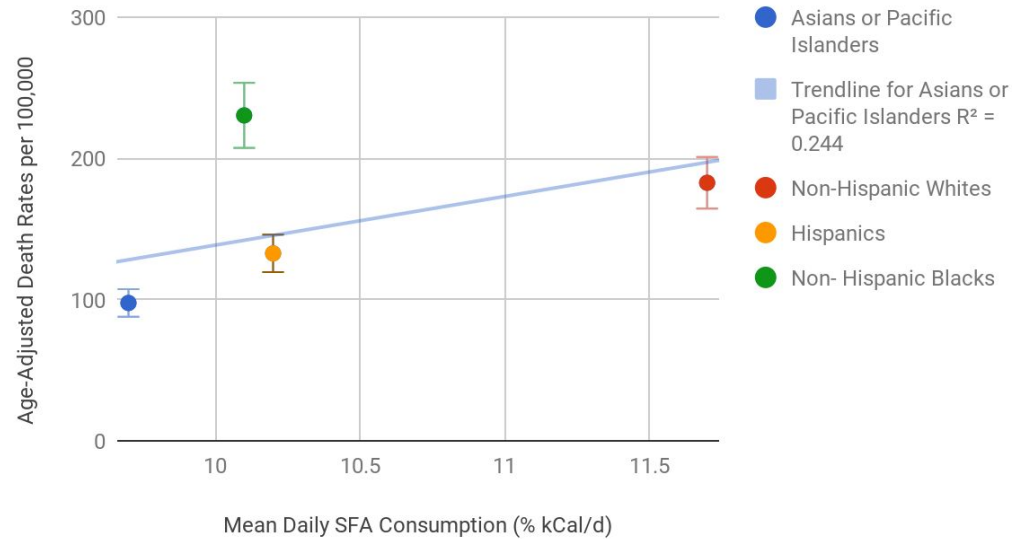
Figure 10: Distribution of CVD by ethnicity

SSB Consumption's Effect On CVD Risk By Ethnicity



Graph 1: Increase of SSB consumption results in an increase of CVD risk

SFA Consumption's Effect On CVD Risk By Ethnicity



Graph 2: Increase of SFA consumption results in less of an increase of CVD risk

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Discussion

Conclusion

- Alternate hypothesis accepted
- SSB is more significant in CVD Risk
- SFA little effect on CVD

Further Work

- Current Solutions
- Other Demographics
- Trans Fats
- Hispanic Paradox
- Further research on causation

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References

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