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CHSI

INFORMATION FOR  
IMPROVING COMMUNITY HEALTH

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, CENTERS FOR DISEASE CONTROL AND PREVENTION

# Community Health Status Indicators (CHSI) Analysis

STAT 605

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1. Goal: Use the Community Health Status Indicators to effectively figure out main leading causes of death in US and Texas and their related risk factors
2. Outline:
  - Introduction of CHSI health indicators
  - Leading Causes of Death in US
  - Leading Causes of Death in Texas
  - Risk Factors for premature death
  - Conclusion



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## What is CHSI (Community Health Status Indicators)?

- A resource for monitoring and analyzing community health status and its determinants at the county level
- The goal of CHSI is to give local public health agencies another tool for promoting community health status



## What Are Health Indicators?

- A **health indicator** is “a characteristic of an individual, population, or environment which is subject to measurement and can be used to describe one or more aspects of the health of an individual or population.”  
(e.g. Life expectancy, Obesity, Diabetes, High blood pressure, Cancer )

- Source:
  - Definition of Wellness web site  
<http://www.definitionofwellness.com/dictionary/health-indicator.html>



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## CHSI Health Indicators Dataset

**Data: 3,141 U.S. counties, 10 tables**

- Demographics
- Summary measures of health
- National leading causes of death
- Measures of birth and death
- Relative health importance
- Vulnerable populations
- Environmental health
- Preventive services use
- Risk factors for premature death
- Access to care



Source: [http://www.communityhealth.hhs.gov/Companion\\_Document/CHSI-Data\\_Sources\\_Definitions\\_And\\_Notes.pdf](http://www.communityhealth.hhs.gov/Companion_Document/CHSI-Data_Sources_Definitions_And_Notes.pdf)

## Table 1: Leading Causes of Death

- Pregnancy Complication Rate
- Birth Defect Rate
- Injury Rate
- Cancer Rate
- Homicide Rate
- Suicide Rate
- Heart Disease Rate
- HIV Rate

Each health indicator rate is mortality rate per 100,000 population



### Table 2: Risk Factors and Access to Care

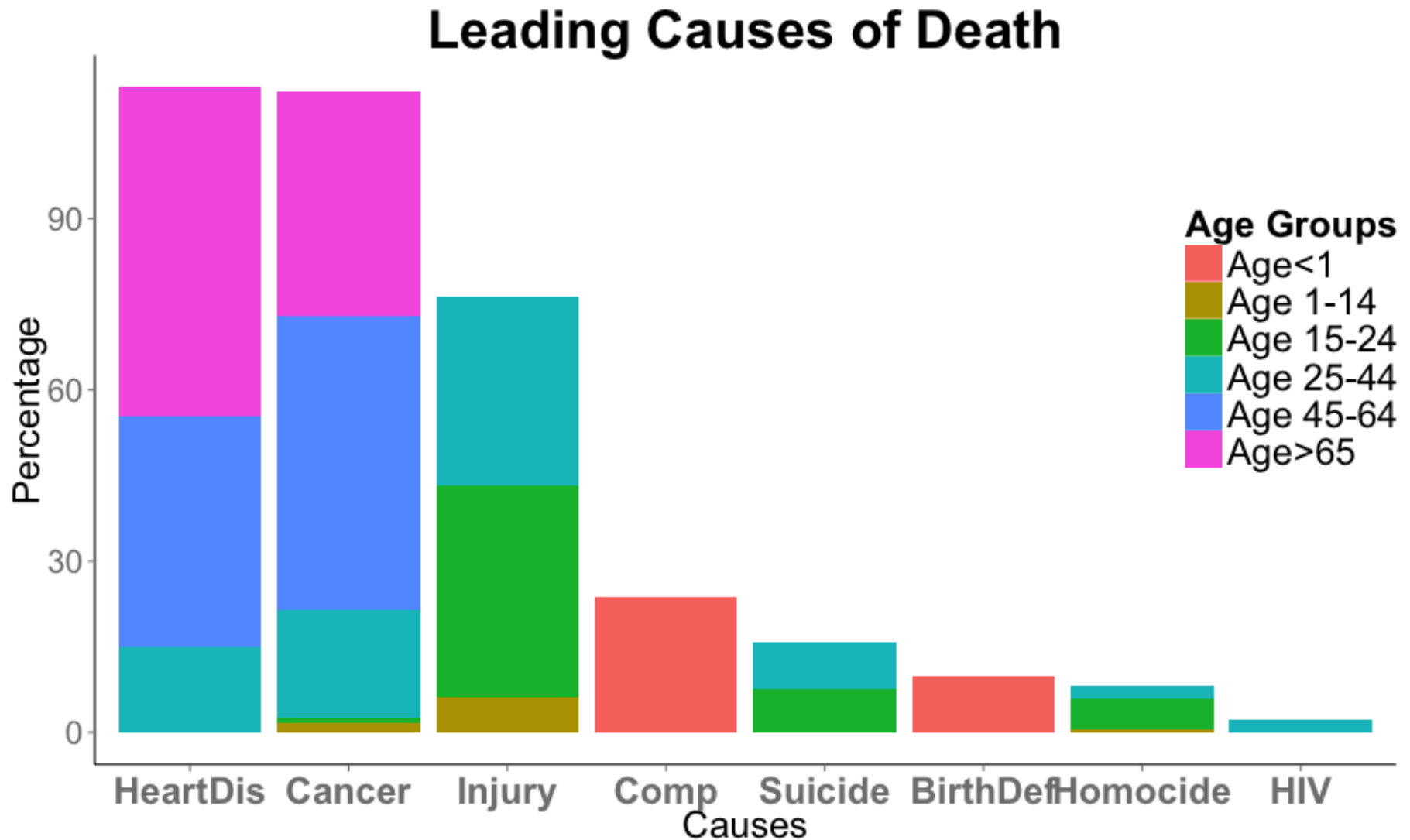


- No Exercise Rate
- Few Fruit and Vegetable Rate
- Obesity Rate
- High Blood Pressure Rate
- Smoker Rate
- Diabetes

Each health indicator rate measures the count of people at this specific risk per 100 population



## Leading Causes of Death in US



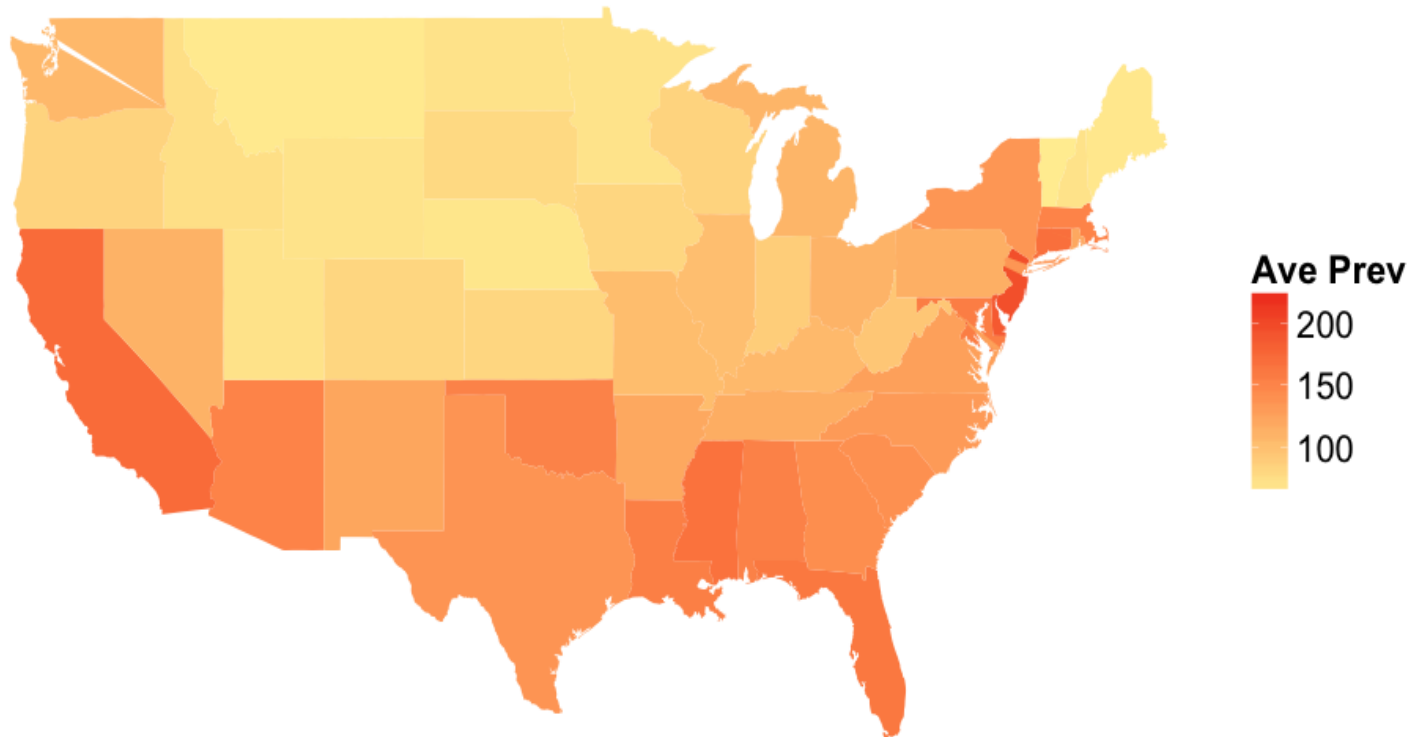




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## Prevalence of Deaths Caused by Heart Disease National Level

### Average Prevalence of Deaths Caused by Heart Disease



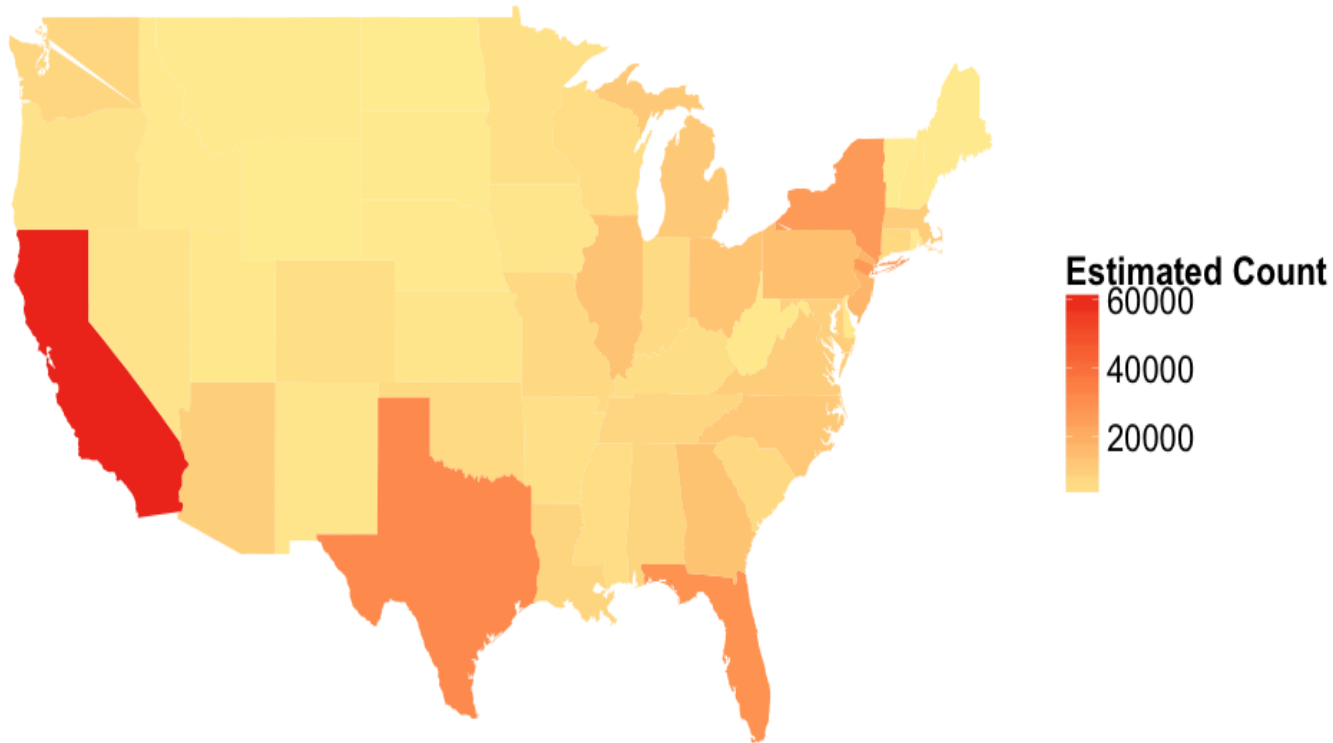
1. Average prevalence of deaths for every 100,000 people throughout the nation
2. Higher in the south, west and east coast



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## Count of Deaths Caused by Heart Disease National Level

### Estimated Count of Deaths Caused by Heart Disease



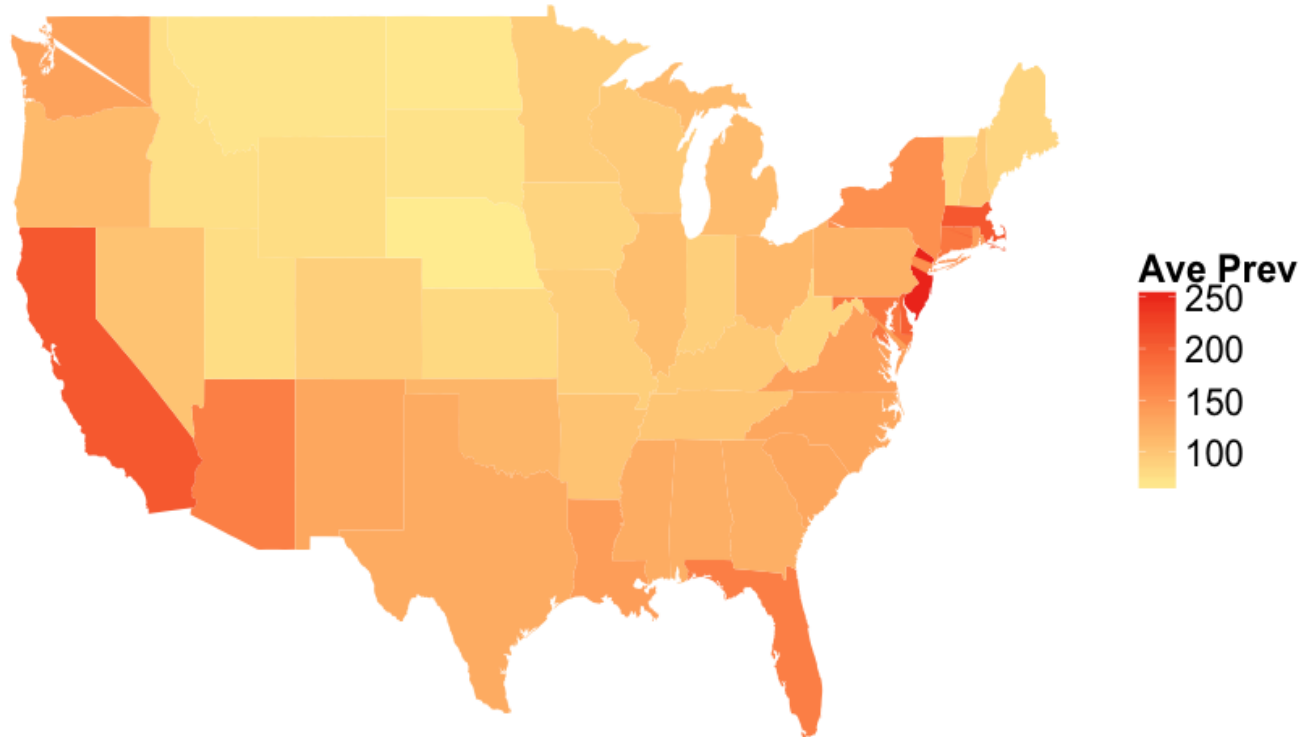
**Texas:** Second highest estimated count of death caused by heart disease (after taking consideration of population size)



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## Prevalence of Deaths Caused by Cancer National Level

### Average Prevalence of Deaths Caused by Cancer



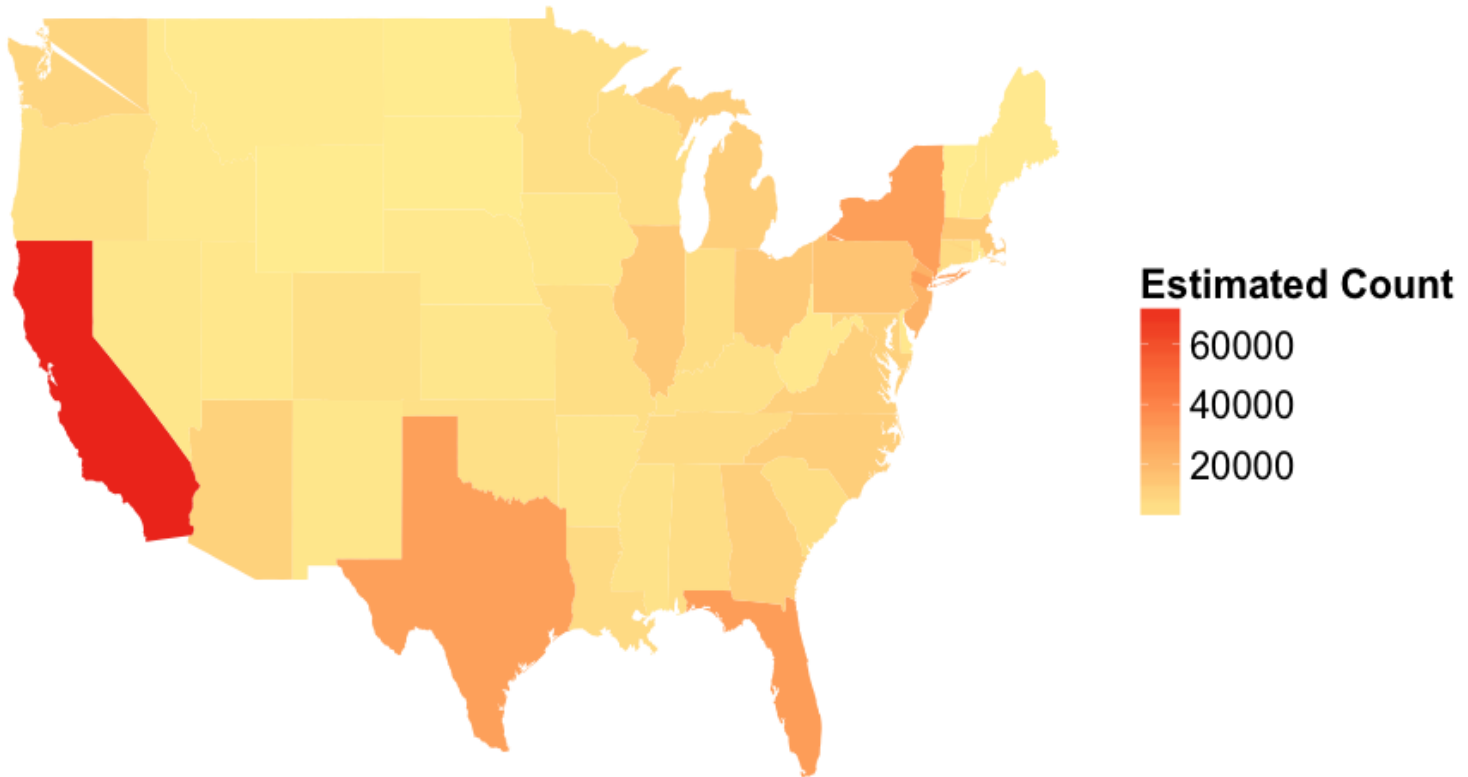
1. Average prevalence of deaths for every 100,000 people throughout the nation
2. Higher in the south, west and west coast



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## Count of Deaths Caused by Cancer National Level

### Estimated Count of Deaths Caused by Cancer



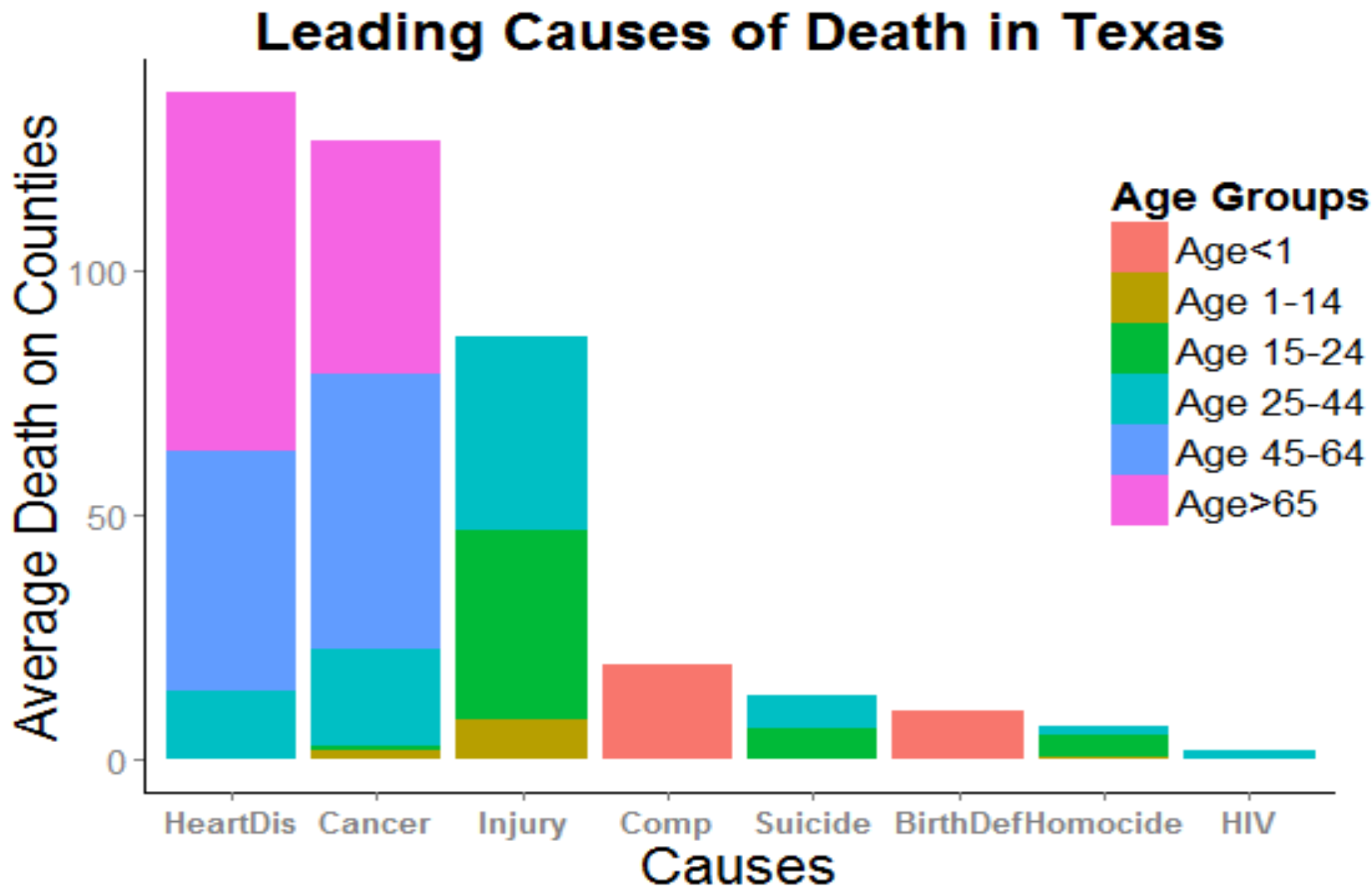
**Texas:** Second highest estimated count of death caused by heart disease (after taking consideration of population size)



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# Leading Causes of Death in Texas

## 254 Counties in Texas



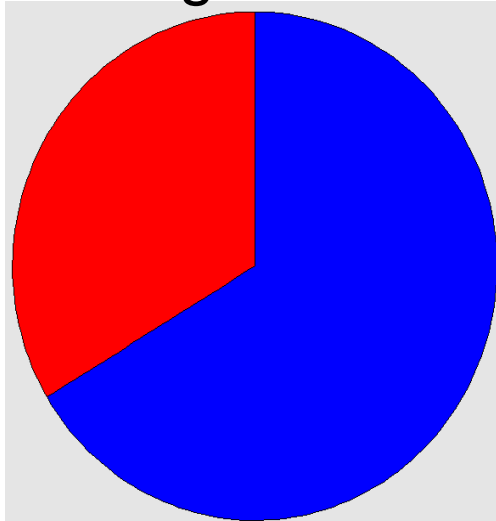


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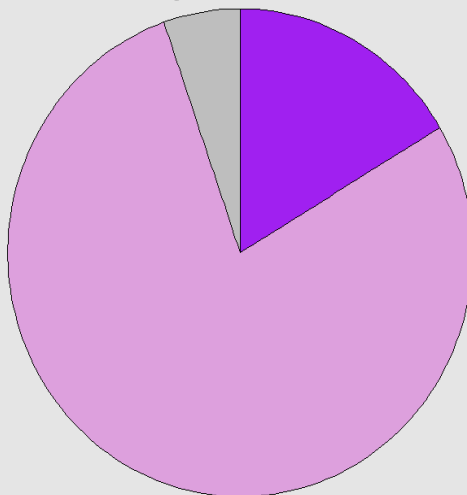
# Leading Causes of Death in Texas

## Disease Structure at Age Levels

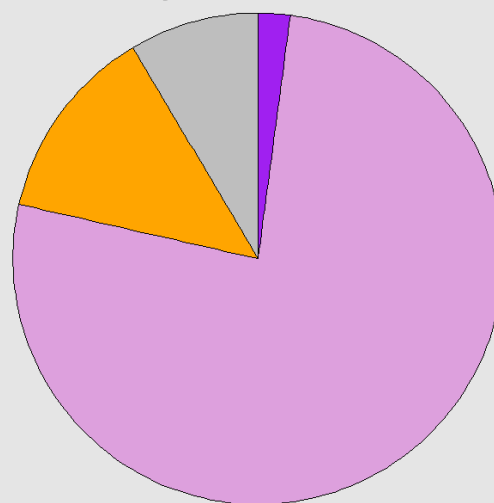
Age <1



Age 1-14



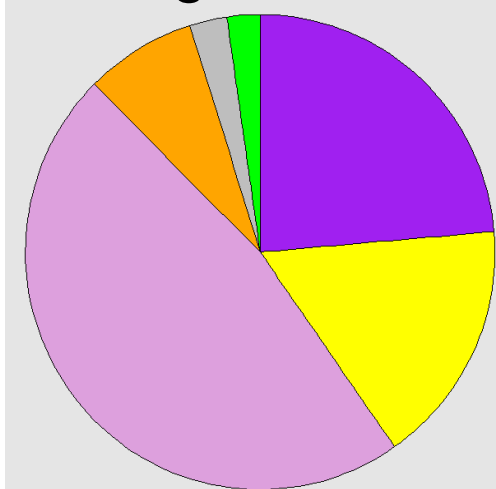
Age 15-24



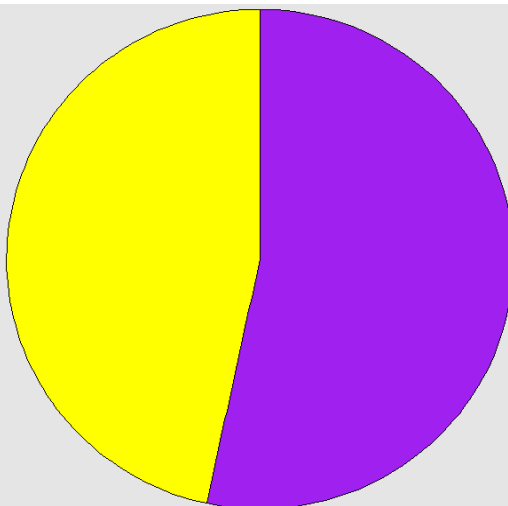
Death\_cause

BirthDef  
Cancer  
Comp  
Heart Disease  
HIV  
Homicide  
Injury  
Suicide

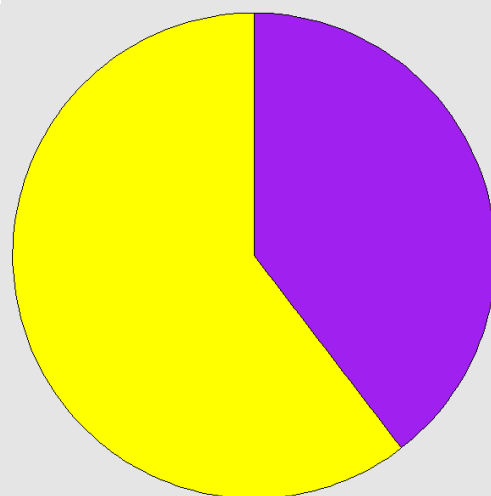
Age 25-44



Age 45-64



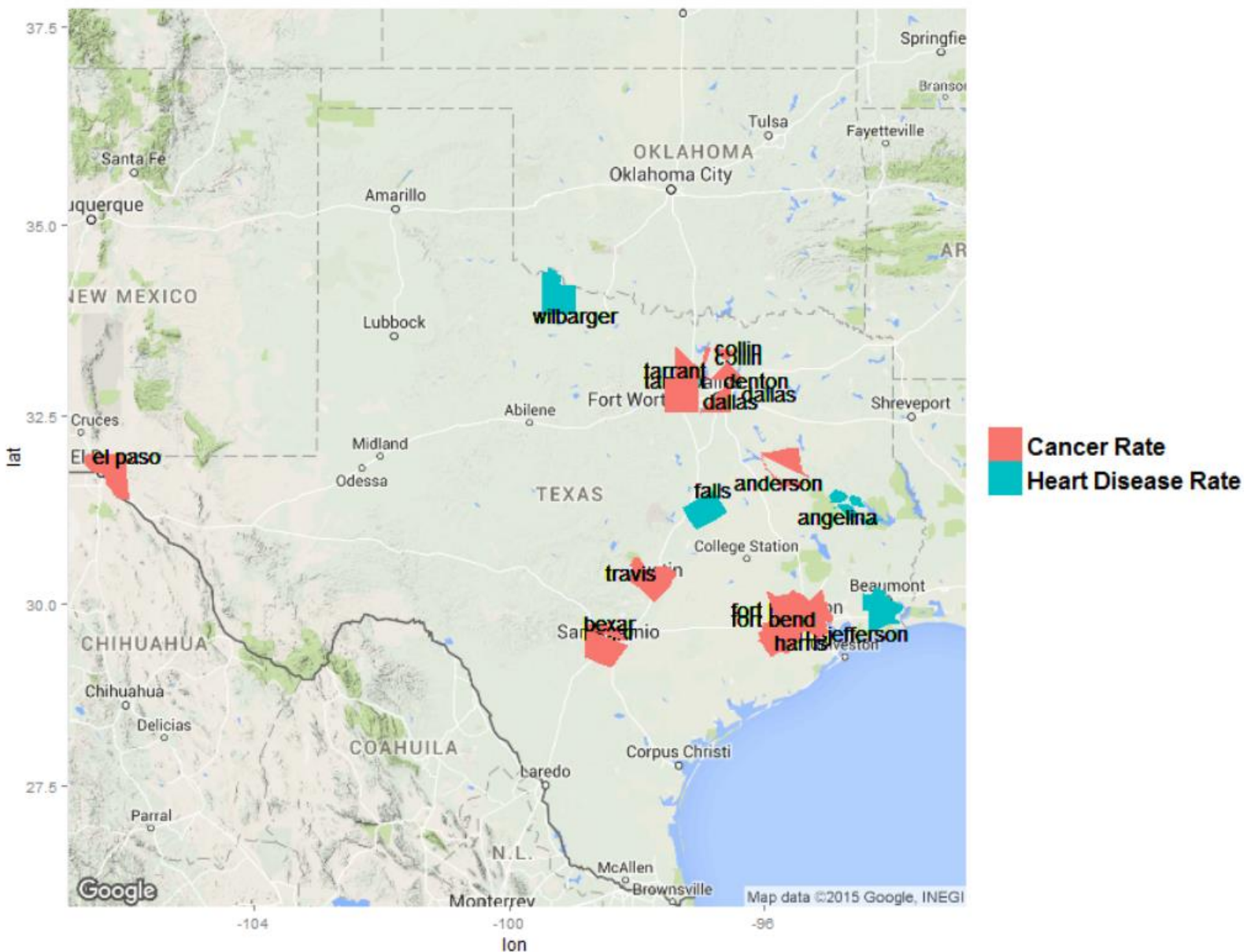
Age >65





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## Top 10 Counties for Heart Disease and Cancer County-Level

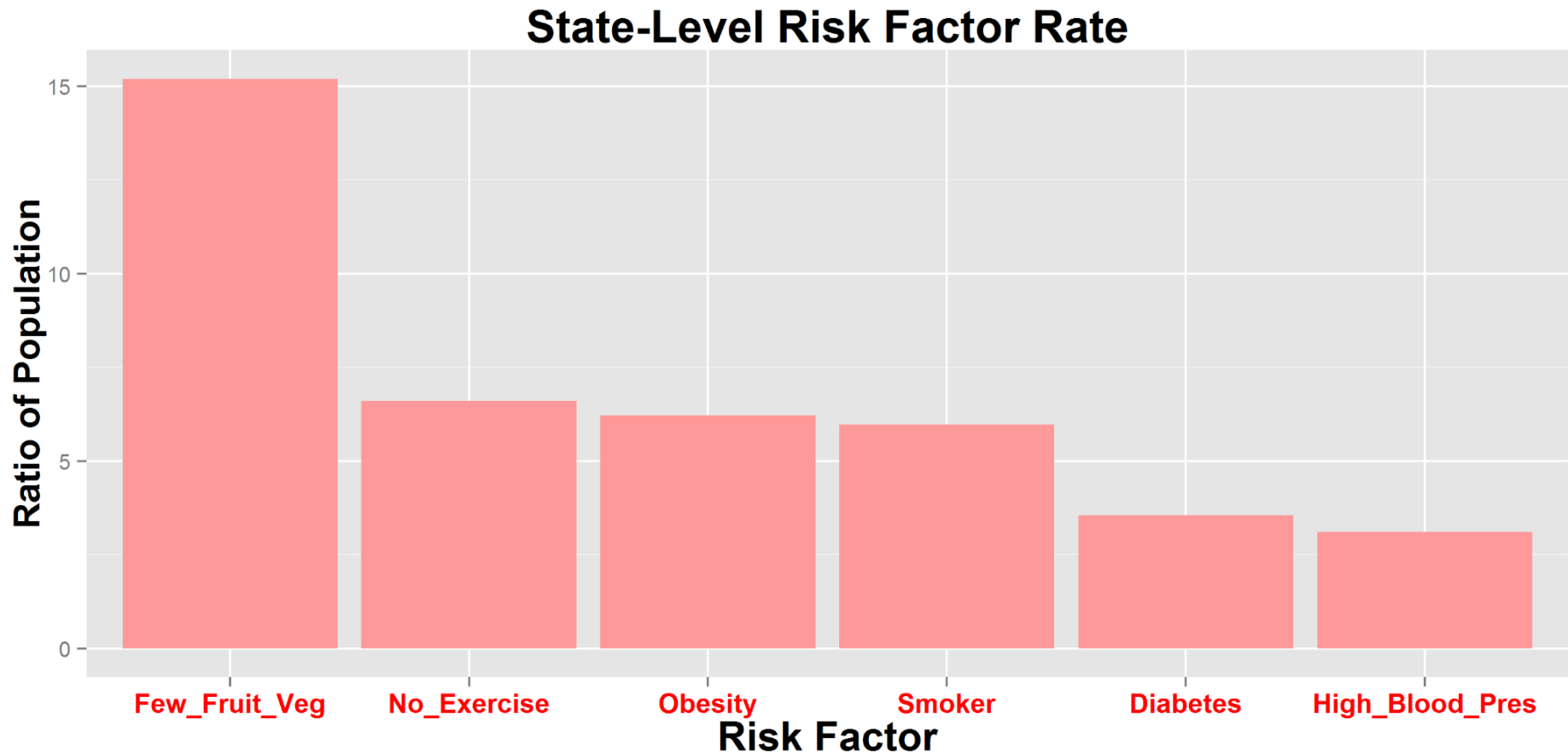




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## Risk Factors for Premature Deaths

### State-Level Status







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# Risk Factors for Premature Deaths

## Regression of Heart Disease Rate on Risk Factors

Risk Factors	Coefficients	P-Value
Diabetes	0.17983	0.000149
High Blood Pressure	0.11485	0.001089

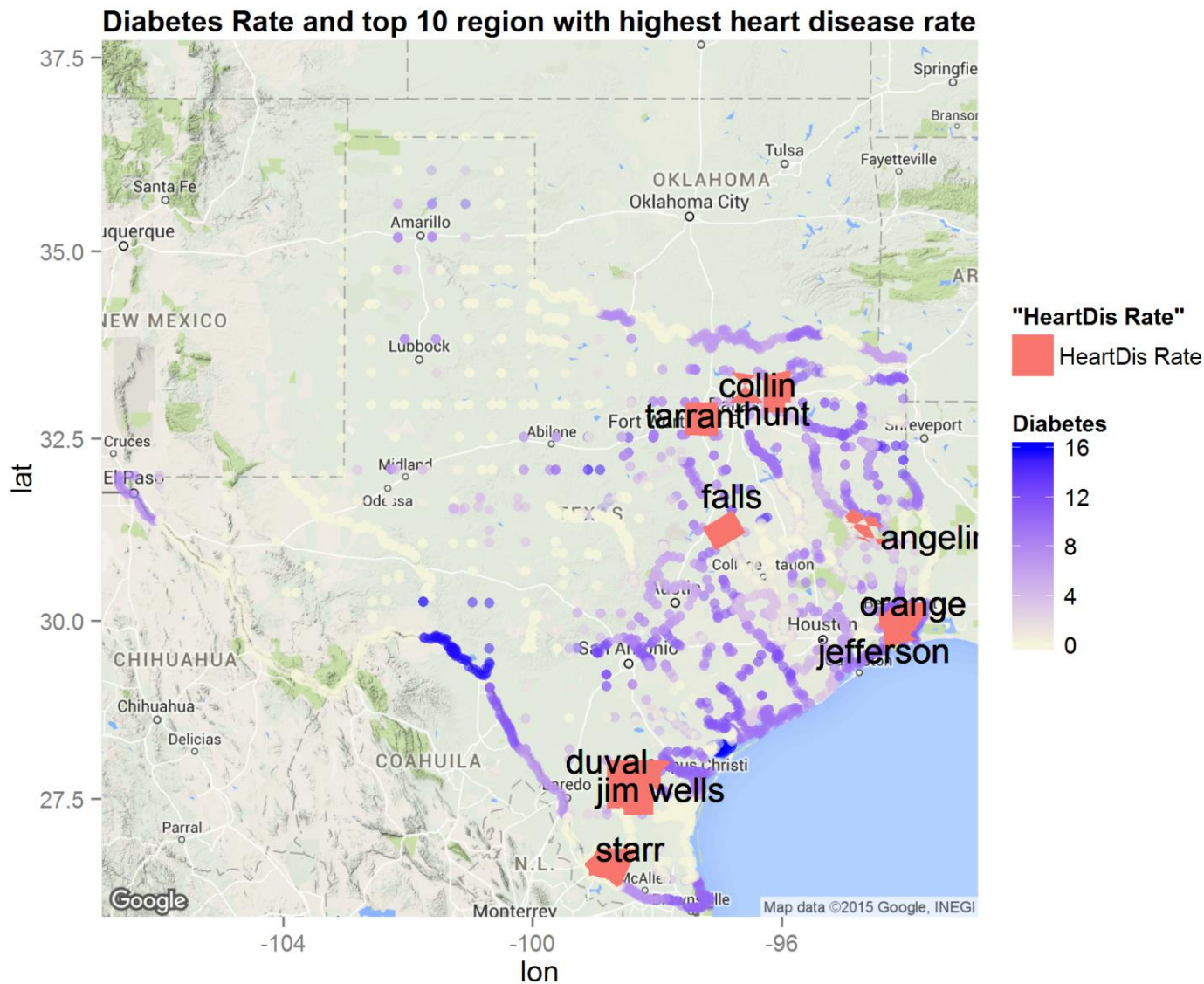
$R^2 = 0.8582$

Adjusted  $R^2 = 0.8571$



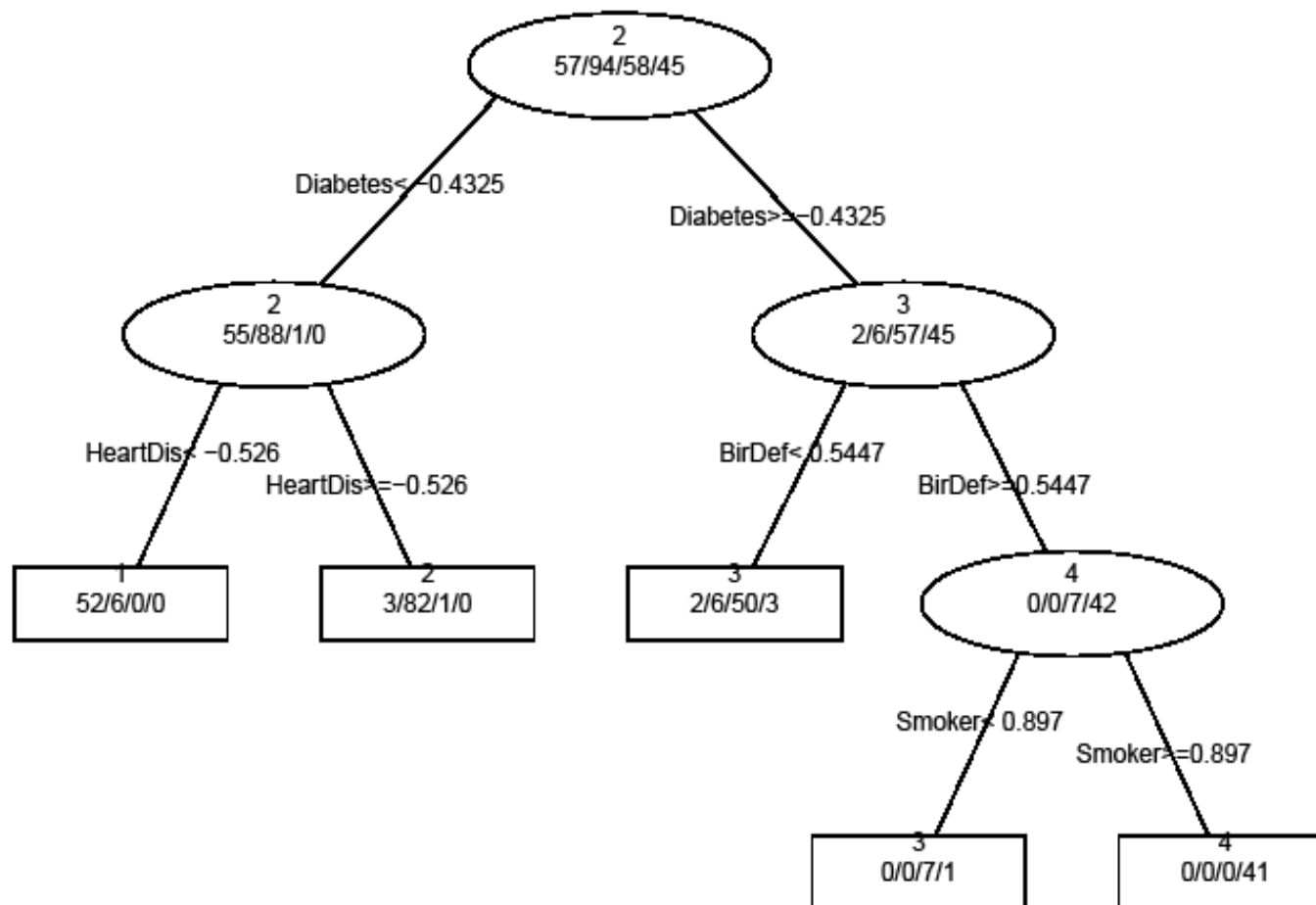
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## Risk Factors High Heart Disease Rate Area V.S. Diabetes Rate Area





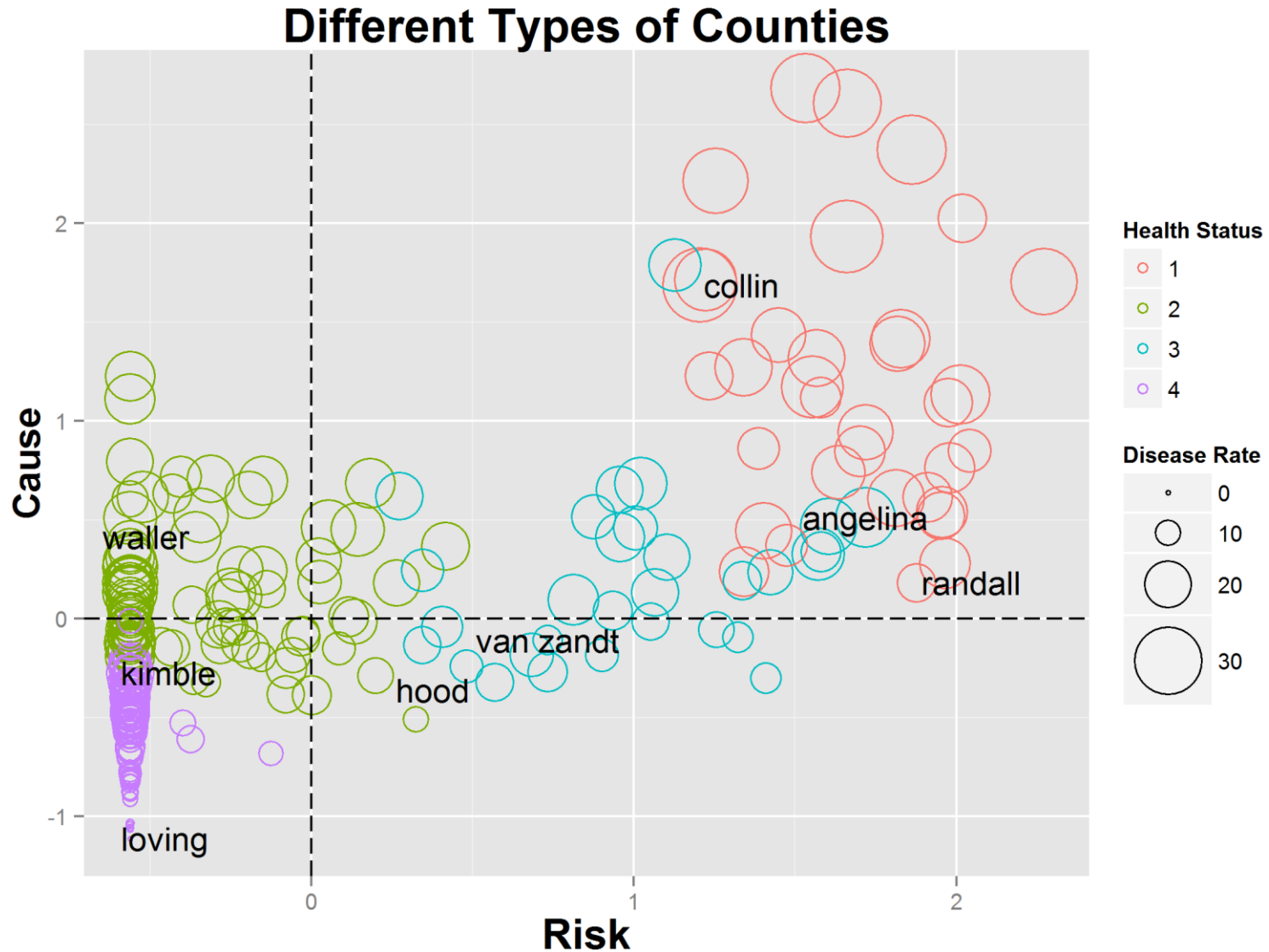
Pruned Classification Tree for 254 Counties





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## Risk Factors Different Types of Counties





# Conclusion

- Heart disease and cancer are the two top leading causes of death in the US and in Texas
- People who are 45 years of age and above are the major victims of deaths due to these two diseases
- Diabetes and high blood pressure are two significant influential risk factors that are highly associated with mortalities caused by heart disease
- Different counties exhibit different patterns in terms of risk factors and mortality rate, so health recommendations should be made accordingly



Thank You For Your Time

ANY QUESTIONS?