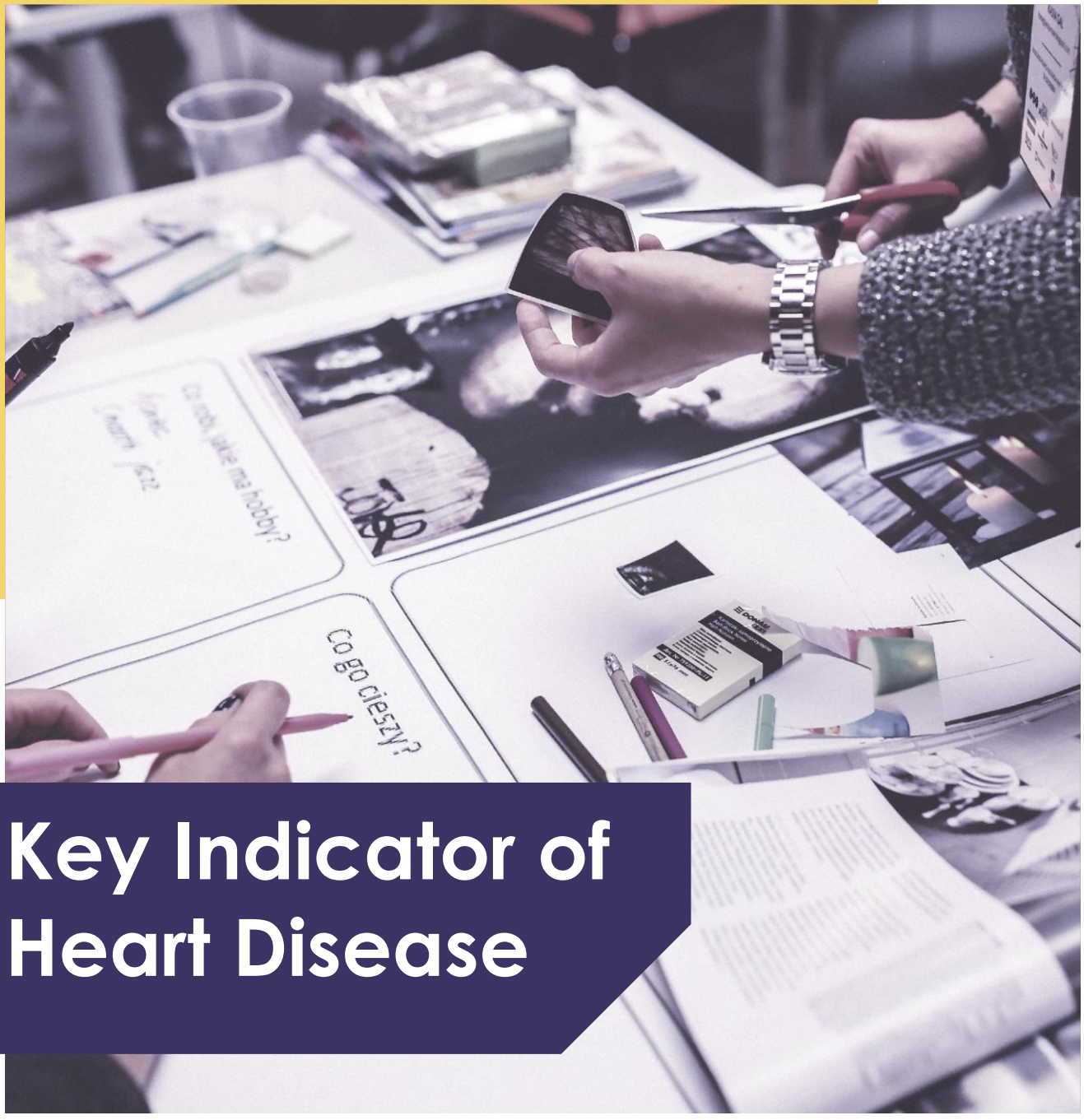


Key Indicator of Heart Disease

Ambika Sharma – CIN - 401349647

TABLE OF CONTENTS

INTRODUCTION

As per the CDC, heart illness is one of the main reasons of death for individuals of most races in the US (American Indians, African Americans, white individuals, and Alaska Natives). About a portion of all Americans (47%) have something like 1 of 3 crucial risk aspects for heart illness: hypertension, elevated cholesterol, and smoking. Other key pointers incorporate stoutness (high BMI), diabetic status, drinking an excessive amount of liquor, smoking extensively or not getting sufficient actual work. Identifying and forestalling the variables that affect heart illness is vital in medical care. Computational turns of events, thus, permit the use of AI strategies to recognize "designs" from the information that can foresee a patient's condition. The reason for this information examination and perceptive inspection is to even more likely comprehend which factors influence a patient's risk for coronary illness. To achieve this, a prologue to the information will be made, alongside a graphical investigation of the wellbeing factors in the dataset. The prescient demonstrating cycle will be presented, giving the foundation for the assessment of the calculated relapse prescient model. This assessment will comprise of exploring execution measurements from the disarray network. To conclude, an explanation of the model's calculation will be given in a specific manual to show how the factors drove the figure. The silver lining is that cardiovascular failures are uncommonly preventable and essential lifestyle modifications(such as diminishing alcohol and tobacco use; good dieting propensities and working out) joined with starting treatment tremendously work on its perception. It is, difficult to perceive high-risk patients because of contributory variables, for instance, hypertension, diabetes, elevated cholesterol, and so forth. This report centers around the factual way to deal with giving results through diagrams, designs, and so on perceiving a few perspectives that become known and assuming gone to viable lengths in the underlying stage, deadly infection like coronary failure can likewise be controlled at an underlying stage.[1]

[1] Agency for Healthcare Research and Quality. Healthcare Cost and Utilization Project (HCUP).Accessed April 1, 2020.

DATA DESCRIPTION

This report consists of data set from:

https://www.kaggle.com/datasets/kamilpytlak/personal-key-indicators-of-heart-disease

https://www.cdc.gov/dhdsp/maps/atlas/data-sources.html

The above links involves working on three excel sheets –

Year	LocationA	LocationD	Geograph	Heart Dise	Age	Race
1999	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2013	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2014	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2005	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2012	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2010	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2009	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2011	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2007	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2019	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2018	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2004	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2016	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2015	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2000	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2002	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2003	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2006	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2008	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2001	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2017	AL	Autauga	County	All heart d	Ages 35-6	American Indian/Alaska Native
2015	AL	Autauga	County	All stroke	Ages 35-6	American Indian/Alaska Native

Rates_and_Trends_in_Heart_Disea

Year	113 Cause	Cause Nar	State	Deaths	Age-adjuste
2017	Accidents	Unintentic	United Sta	169,936	49.4
2017	Accidents	Unintentic	Alabama	2,703	53.8
2017	Accidents	Unintentic	Alaska	436	63.7
2017	Accidents	Unintentic	Arizona	4,184	56.2
2017	Accidents	Unintentic	Arkansas	1,625	51.8
2017	Accidents	Unintentic	California	13,840	33.2
2017	Accidents	Unintentic	Colorado	3,037	53.6
2017	Accidents	Unintentic	Connectici	2,078	53.2
2017	Accidents	Unintentic	Delaware	608	61.9
2017	Accidents	Unintentic	District of	427	61
2017	Accidents	Unintentic	Florida	13,059	56.1
2017	Accidents	Unintentic	Georgia	4,712	45.2
2017	Accidents	Unintentic	Hawaii	585	35.7
2017	Accidents	Unintentic	Idaho	876	49.8
2017	Accidents	Unintentic	Illinois	6,019	44.4
2017	Accidents	Unintentic	Indiana	3,978	58.7
2017	Accidents	Unintentic	Iowa	1,536	42.8
2017	Accidents	Unintentic	Kansas	1,567	49.4
2017	Accidents	Unintentic	Kentucky	3,264	72.9
2017	Accidents	Unintentic	Louisiana	2,780	58.9
2017	Accidents	Unintentic	Maine	990	68
2017	Accidents	Unintentic	Maryland	2,408	36.9

NCHS_-_Leading_Causes_of_Death_

HeartDise	BMI	Smoking	AlcoholDr	Stroke	PhysicalHe	MentalHe	DiffWalkir	Sex	AgeCateg	Race	Diabetic	PhysicalAc	GenHealth	SleepTime	Asthma	KidneyDis	SkinCancer
No	16.6	Yes	No	No	3	30	No	Female	55-59	White	Yes	Yes	Very good	5	Yes	No	Yes
No	20.34	No	No	Yes	0	0	No	Female	80 or olde	White	No	Yes	Very good	7	No	No	No
No	26.58	Yes	No	No	20	30	No	Male	65-69	White	Yes	Yes	Fair	8	Yes	No	No
No	24.21	No	No	No	0	0	No	Female	75-79	White	No	No	Good	6	No	No	Yes
No	23.71	No	No	No	28	0	Yes	Female	40-44	White	No	Yes	Very good	8	No	No	No
Yes	28.87	Yes	No	No	6	0	Yes	Female	75-79	Black	No	No	Fair	12	No	No	No
No	21.63	No	No	No	15	0	No	Female	70-74	White	No	Yes	Fair	4	Yes	No	Yes
No	31.64	Yes	No	No	5	0	Yes	Female	80 or olde	White	Yes	No	Good	9	Yes	No	No
No	26.45	No	No	No	0	0	No	Female	80 or olde	White	No, borde	No	Fair	5	No	Yes	No
No	40.69	No	No	No	0	0	Yes	Male	65-69	White	No	Yes	Good	10	No	No	No
Yes	34.3	Yes	No	No	30	0	Yes	Male	60-64	White	Yes	No	Poor	15	Yes	No	No
No	28.71	Yes	No	No	0	0	No	Female	55-59	White	No	Yes	Very good	5	No	No	No
No	28.37	Yes	No	No	0	0	Yes	Male	75-79	White	Yes	Yes	Very good	8	No	No	No
No	28.15	No	No	No	7	0	Yes	Female	80 or olde	White	No	No	Good	7	No	No	No
No	29.29	Yes	No	No	0	30	Yes	Female	60-64	White	No	No	Good	5	No	No	No
No	29.18	No	No	No	1	0	No	Female	50-54	White	No	Yes	Very good	6	No	No	No
No	26.26	No	No	No	5	2	No	Female	70-74	White	No	No	Very good	10	No	No	No
No	22.59	Yes	No	No	0	30	Yes	Male	70-74	White	No, borde	Yes	Good	8	No	No	No
No	29.86	Yes	No	No	0	0	Yes	Female	75-79	Black	Yes	No	Fair	5	No	Yes	No
No	18.13	No	No	No	0	0	No	Male	80 or olde	White	No	Yes	Excellent	8	No	No	Yes
No	21.16	No	No	No	0	0	No	Female	80 or olde	Black	No, borde	No	Good	8	No	No	No
No	28.9	No	No	No	2	5	No	Female	70-74	White	Yes	No	Very good	7	No	No	No

heart_2020_cleaned

The sheets “Rates and Trends in Heart Disease” and “NCHS Leading Cause of Death” are referred from the **CDC** – Centers for Disease Control and Prevention for profundity in data representation. The other two references apart from “**Key Indicators of Heart Disease**” gave me in depth knowledge about the death rate, area and year in which heart stroke or heart disease occurred.

The dataset worked on contains 22 variables (10 Booleans, 1 integer, 6 strings, 1 date(year) and 4 decimals).

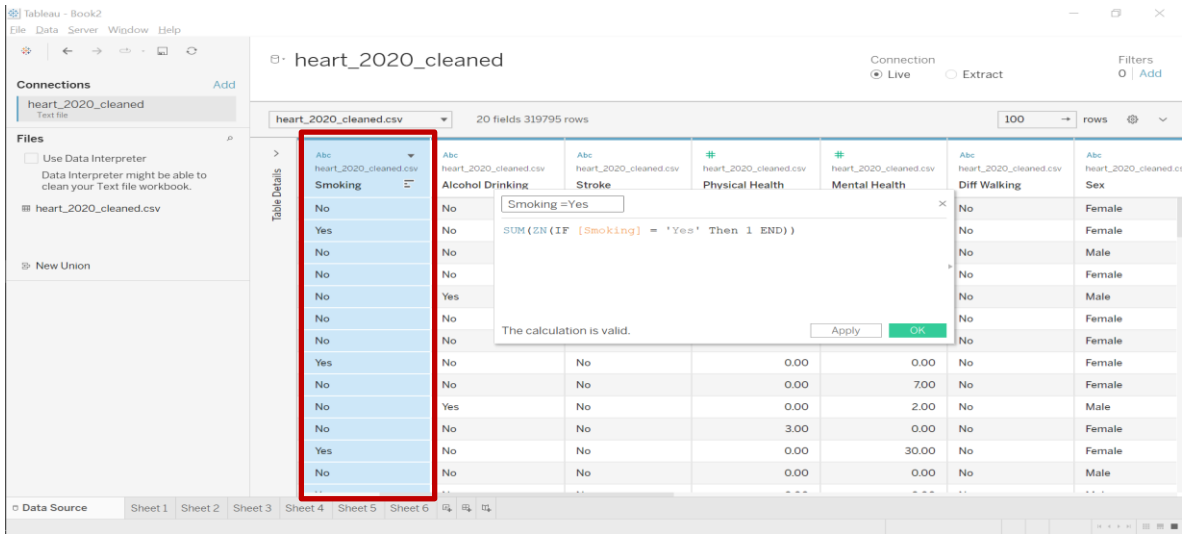
Name	Description	Data Type
HeartDisease	Respondents that have reported coronary heart disease (CHD) or myocardial infarction (MI)	Boolean
BMI	Body Mass Index (BMI)	Decimal
Smoking	Smoked at least 100 cigarettes in entire life? [Note: 5 packs = 100 cigarettes]	Boolean
AlcoholDrinking	Heavy drinkers (adult men having more than 14 drinks per week and adult women having more than 7 drinks per week	Boolean
Stroke	Had a stroke?	Boolean
PhysicalHealth	Physical health, that includes physical illness and injury during the past 30 days	Decimal
MentalHealth	Mental health, during the past 30 days was not good?	Decimal
DiffWalking	Have serious difficulty walking or climbing stairs?	Boolean
Sex	Male or female?	String
AgeCategory	Fourteen-level age category	String
Race	Imputed race/ethnicity value	String
Diabetic	Have diabetes?	Boolean

PhysicalActivity	Adults who reported doing physical activity or exercise during the past 30 days other than their regular job	Boolean
GenHealth	In general health.	String
SleepTime	On average, how many hours of sleep do you get in a 24-hour period?	Decimal
Asthma	Had asthma?	Boolean
KidneyDisease	Had kidney disease?	Boolean
SkinCancer	Had skin cancer?	Boolean
Year	Deaths due to heart disease in the year	Date
Location	Location where the deaths have occurred	String
Deaths	Number of people who died due to heart diseases	Integer
HeartDisease Type	Type of heart disease (Stroke, CDV etc)	String

DATA CLEANING

1. Calculated Fields

- PRE – CLEANING (Smoking)

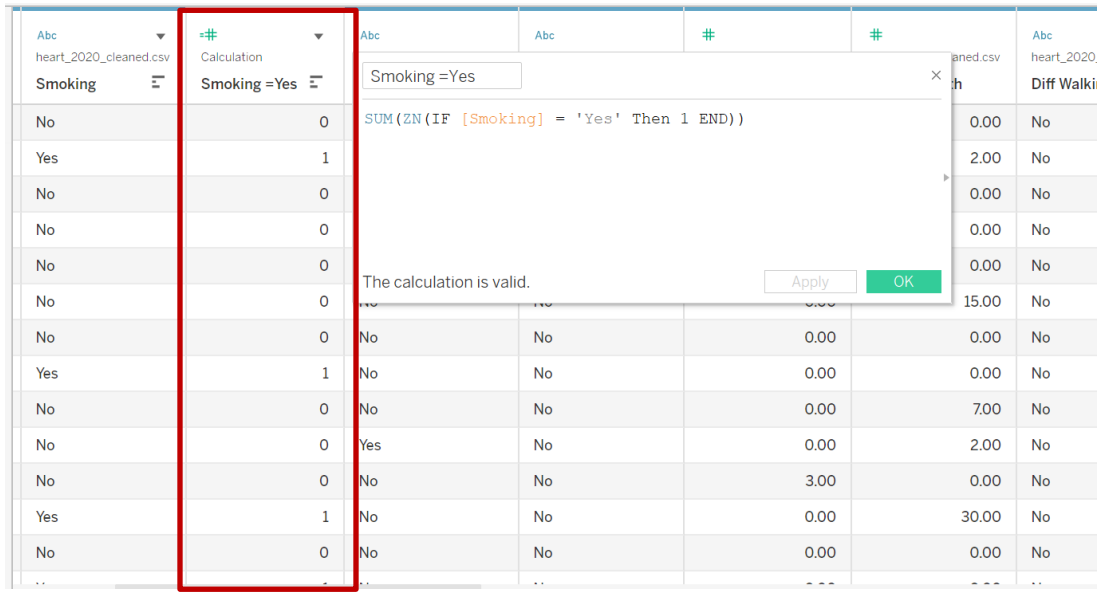


Smoking = Yes

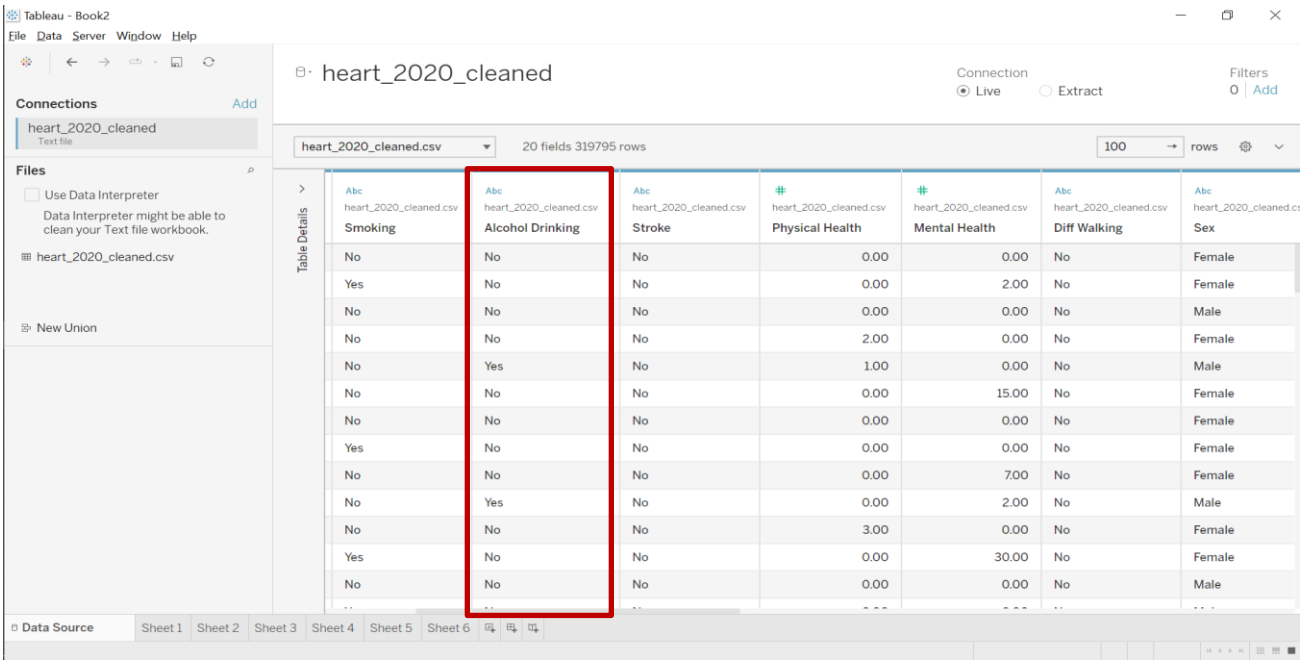
SUM(ZN(IF [Smoking] = 'Yes' Then 1 END))

Checking the value **Yes** in Smoking and converting into 1, so it can be later use in the count or sum of total smoking in the entire life

- POST – CLEANING (Smoking = Yes)



- PRE – CLEANING (Alcohol Drinking)

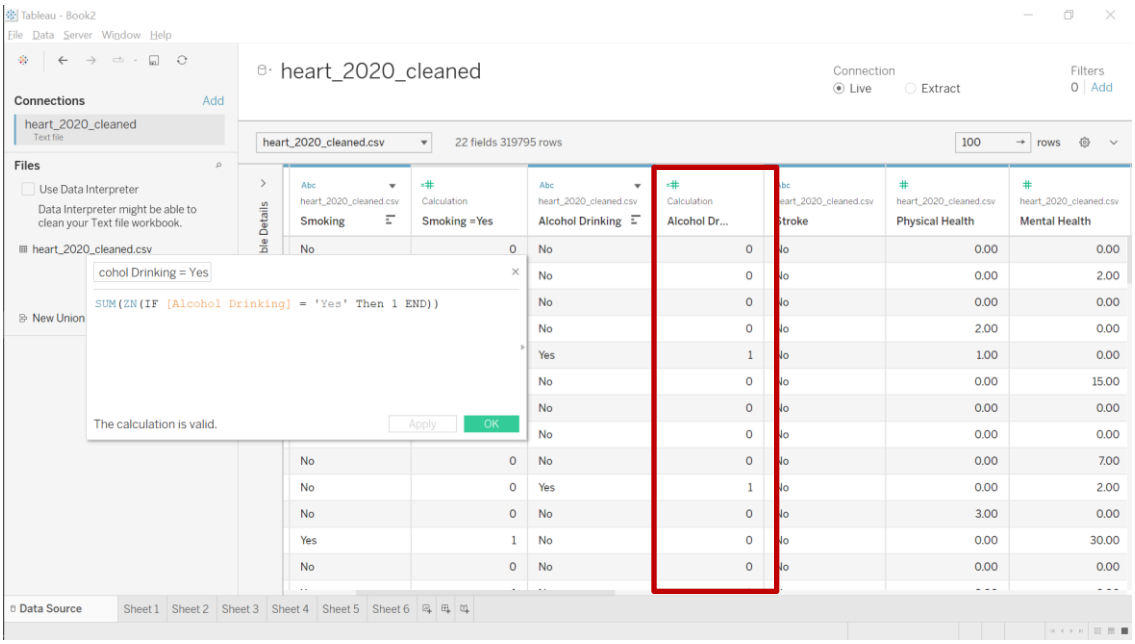


Alcohol Drinking = Yes

SUM(ZN(IF [Alcohol Drinking] = 'Yes' Then 1 END))

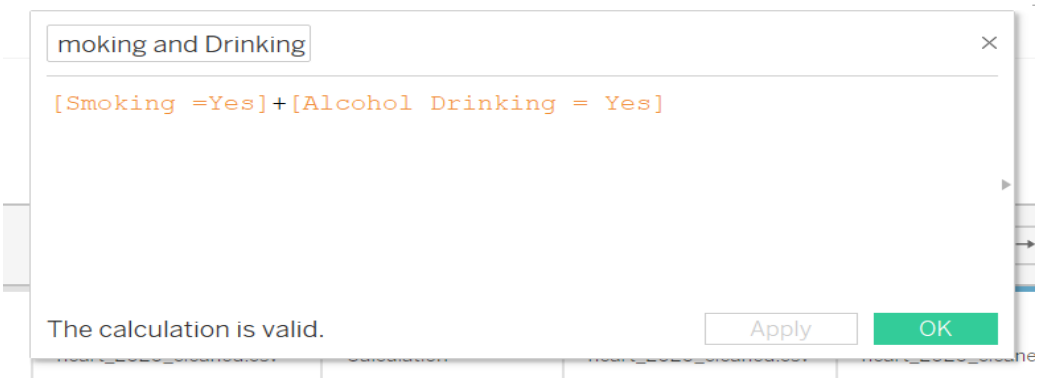
Checking the value **Yes** in Alcohol Drinking and converting into 1, so it can be later use in the count or sum of total alcohol consumption in entire life.

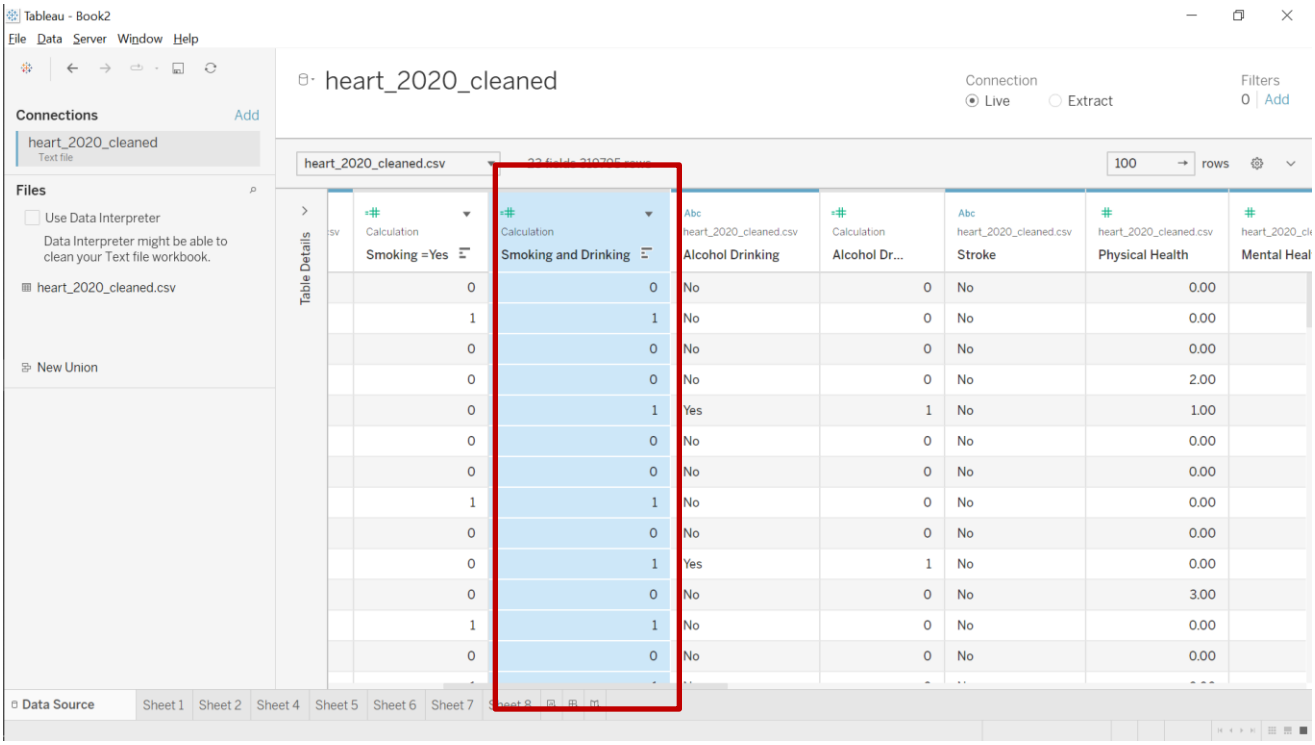
- POST – CLEANING (Alcohol Drinking = Yes)



- Combination of (Alcohol Drinking and Smoking = Yes)

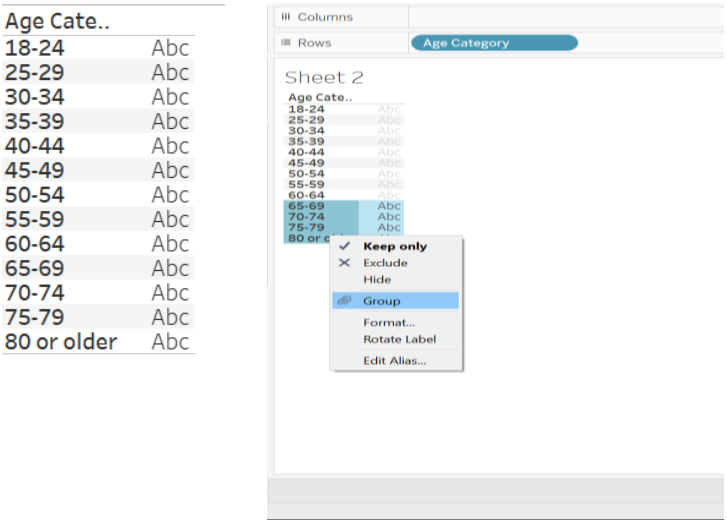
Later combining the drinking and smoking consumption in one column where count is taken for "**Smoking and Drinking**".



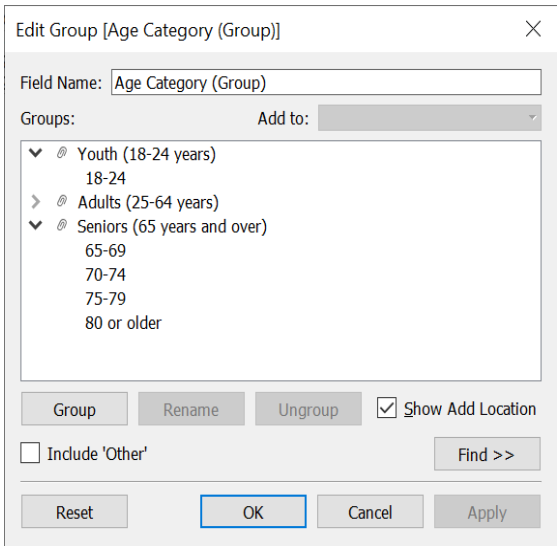


2. Grouping

- PRE – CLEANING (AGE CATEGORY)

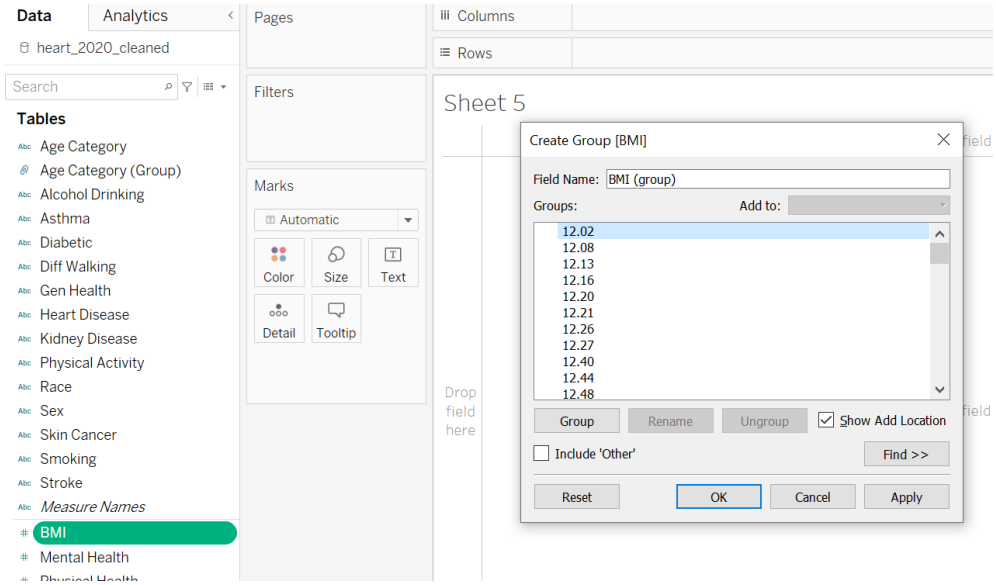


- POST- CLEANING(AGE CATEGORY (GROUP))

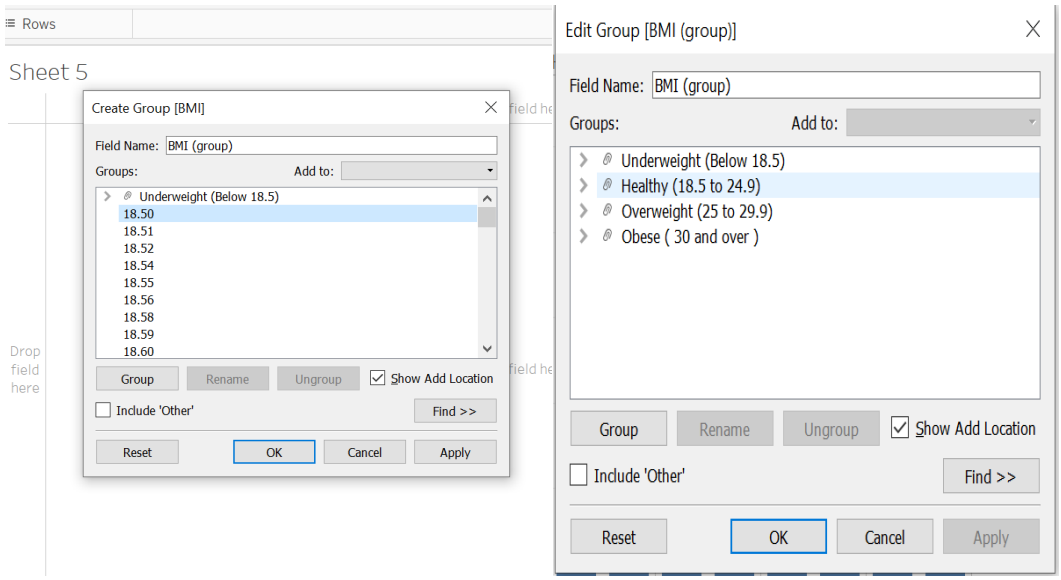


Created three groups of the age category - Youth, Adults, Seniors according to the age distribution in the column. This groups consist of the range from 18 to 24 years for Youth, 25 to 26 – Adults, 65 and above under Senior group.

- PRE – CLEANING (BMI)



- POST – CLEANING (BMI (GROUP))

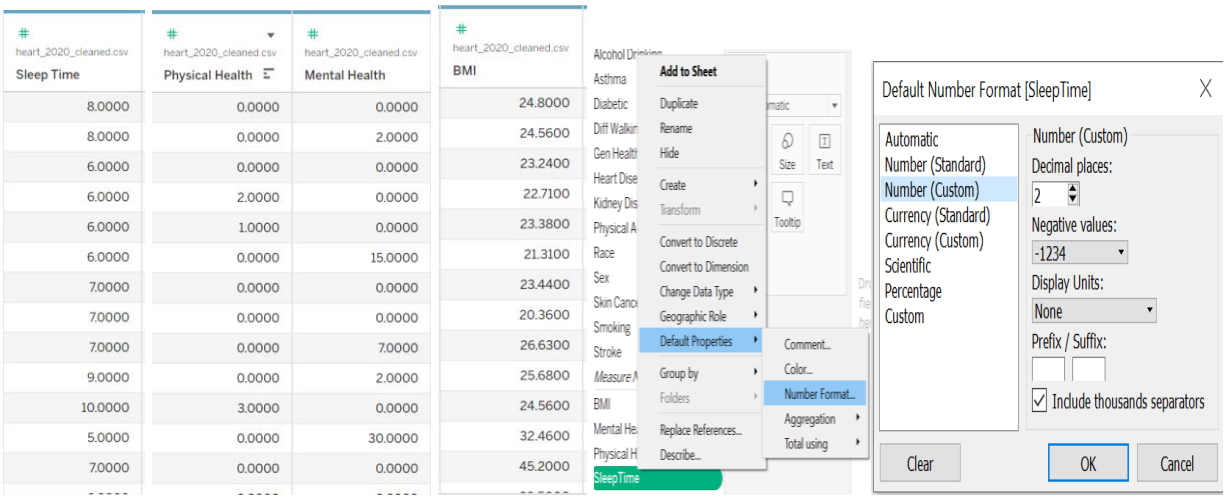


Created four groups of BMI - Underweight, Healthy, Overweight and Obese according to the BMI distribution in the column. This groups consist of the range from 18.5 below for Underweight, 18.5 to 24.9 – Healthy, 25 to 29.9 for Overweight, 30 and over that in group Obese.

3. Decimal to Fixed 2

- PRE – CLEANING (Sleep Time, Physical Health, Mental Health, BMI)

For the below column the data had more than 2 decimal places refining it to fixed 2 decimal places.



heart_2020_cleaned.csv Sleep Time	heart_2020_cleaned.csv Physical Health	heart_2020_cleaned.csv Mental Health	heart_2020_cleaned.csv BMI
8.0000	0.0000	0.0000	24.8000
8.0000	0.0000	2.0000	24.5600
6.0000	0.0000	0.0000	23.2400
6.0000	2.0000	0.0000	22.7100
6.0000	1.0000	0.0000	23.3800
6.0000	0.0000	15.0000	21.3100
7.0000	0.0000	0.0000	23.4400
7.0000	0.0000	0.0000	20.3600
7.0000	0.0000	7.0000	26.6300
9.0000	0.0000	2.0000	25.6800
10.0000	3.0000	0.0000	24.5600
5.0000	0.0000	30.0000	32.4600
7.0000	0.0000	0.0000	45.2000

- POST – CLEANING (Sleep Time, Physical Health, Mental Health, BMI)

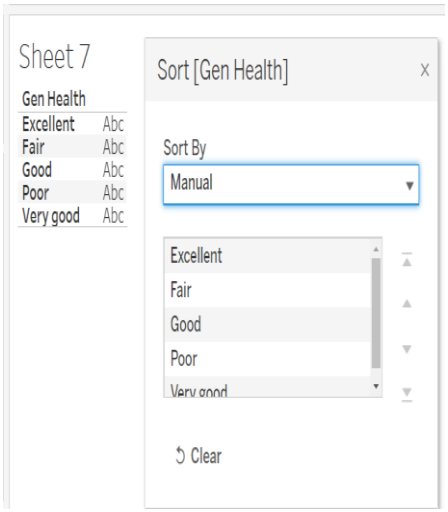
heart_2020_cleaned.csv BMI	heart_2020_cleaned.csv Physical Health	heart_2020_cleaned.csv Mental Health	heart_2020_cleaned.csv SleepTime
25.69	0.00	0.00	8.00
23.73	0.00	0.00	8.00
28.34	0.00	5.00	8.00
28.53	30.00	0.00	7.00
35.43	0.00	10.00	6.00
29.21	30.00	14.00	4.00
39.94	0.00	0.00	4.00
27.37	0.00	0.00	7.00
18.99	0.00	0.00	8.00
25.34	2.00	0.00	7.00
21.93	0.00	0.00	9.00
36.61	0.00	7.00	7.00
27.32	0.00	3.00	8.00

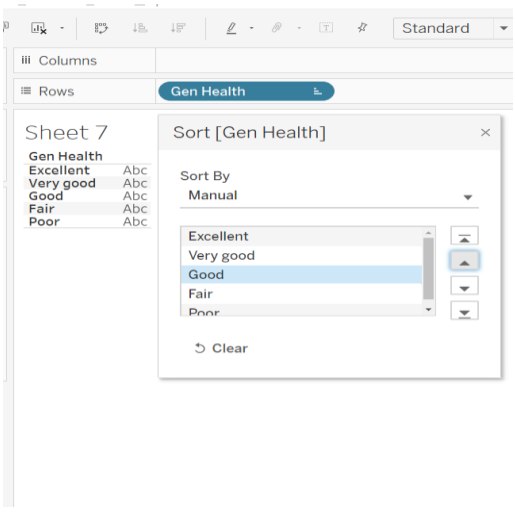
For the fields >> Default Properties>> Number Format>> Number (Custom) >> Decimal Places – 2 to clean the data.

4. Sorting

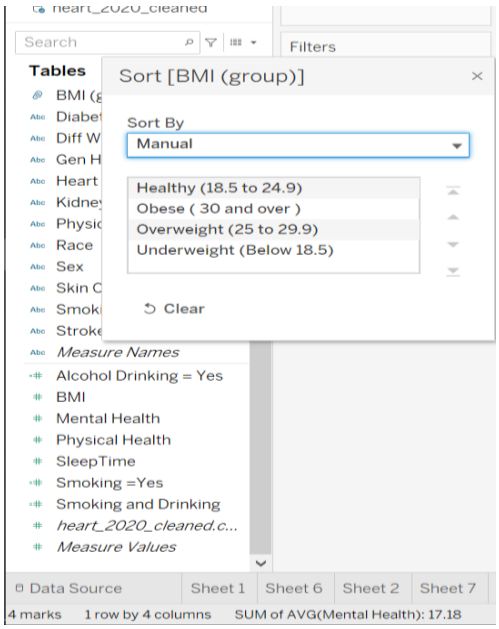
- PRE – CLEANING (Gen Health and BMI Group)

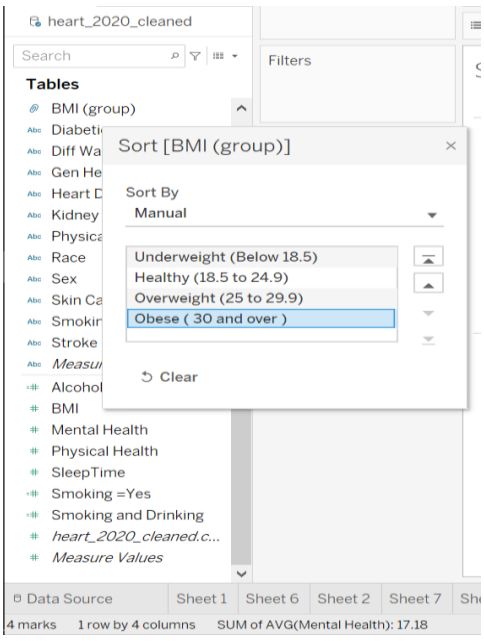
For the below column the data had more than 2 decimal places refining it to fixed 2 decimal places.





- POST – CLEANING (Gen Health and BMI Group)

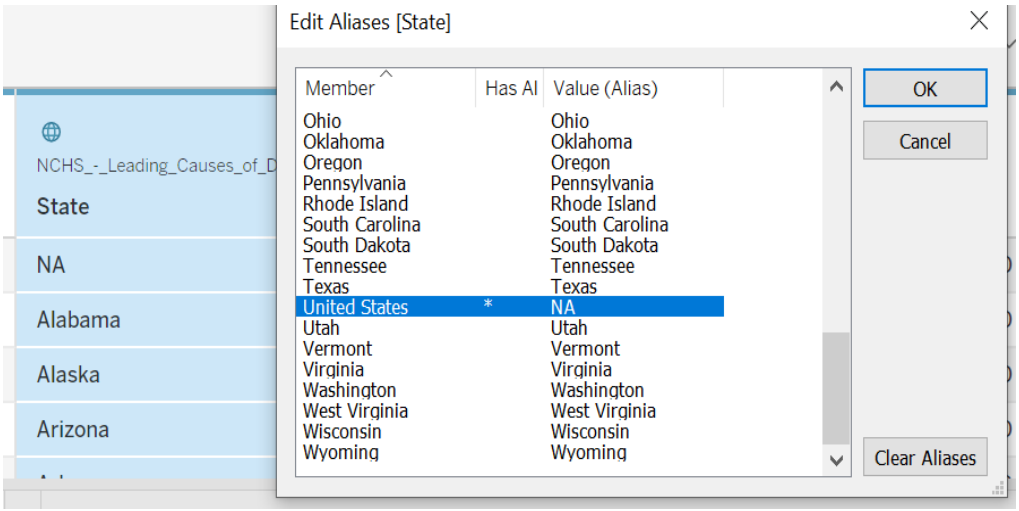




5. Creating Aliases and Filtering

- PRE – CLEANING (STATE)

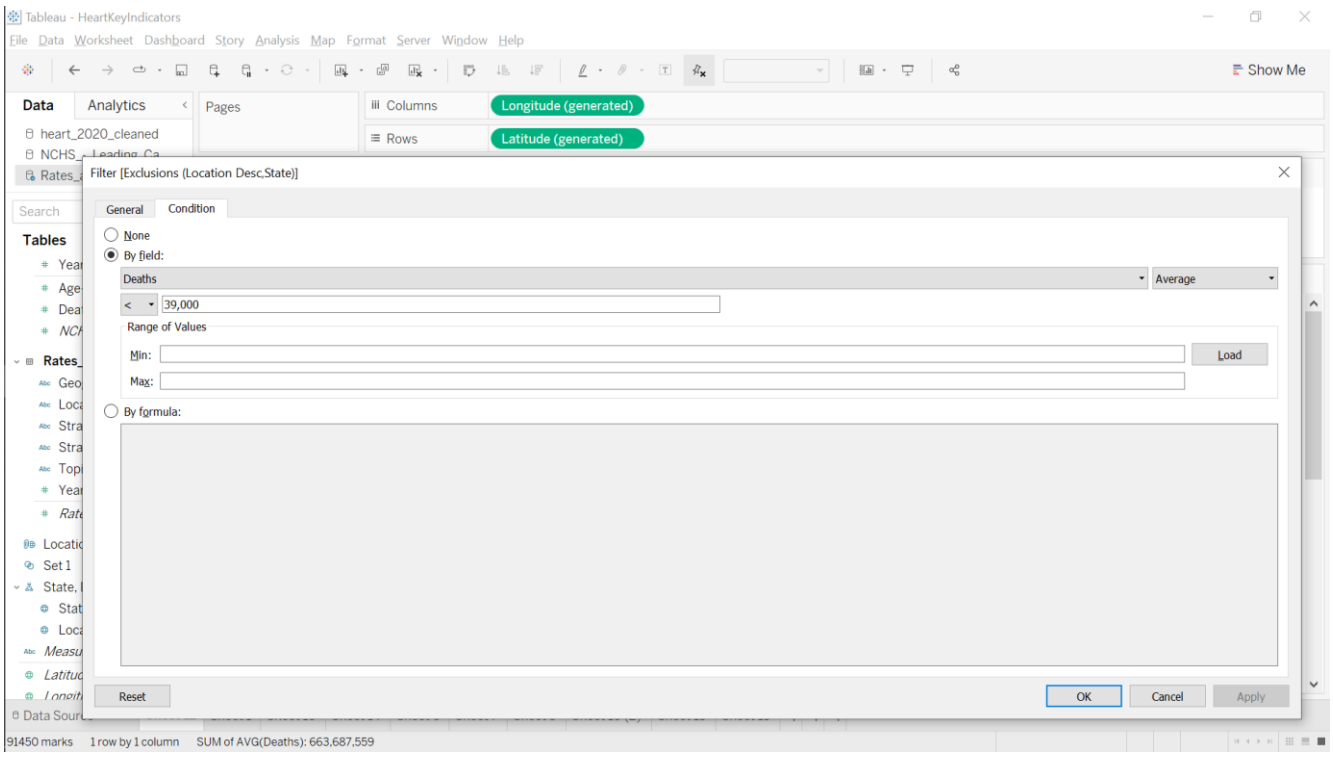
United State is present in State List, this is incorrect so replacing USA with NA through Aliases.



- POST – CLEANING (STATE)

Later taking the average count of deaths in places that involved United States in the calculation.

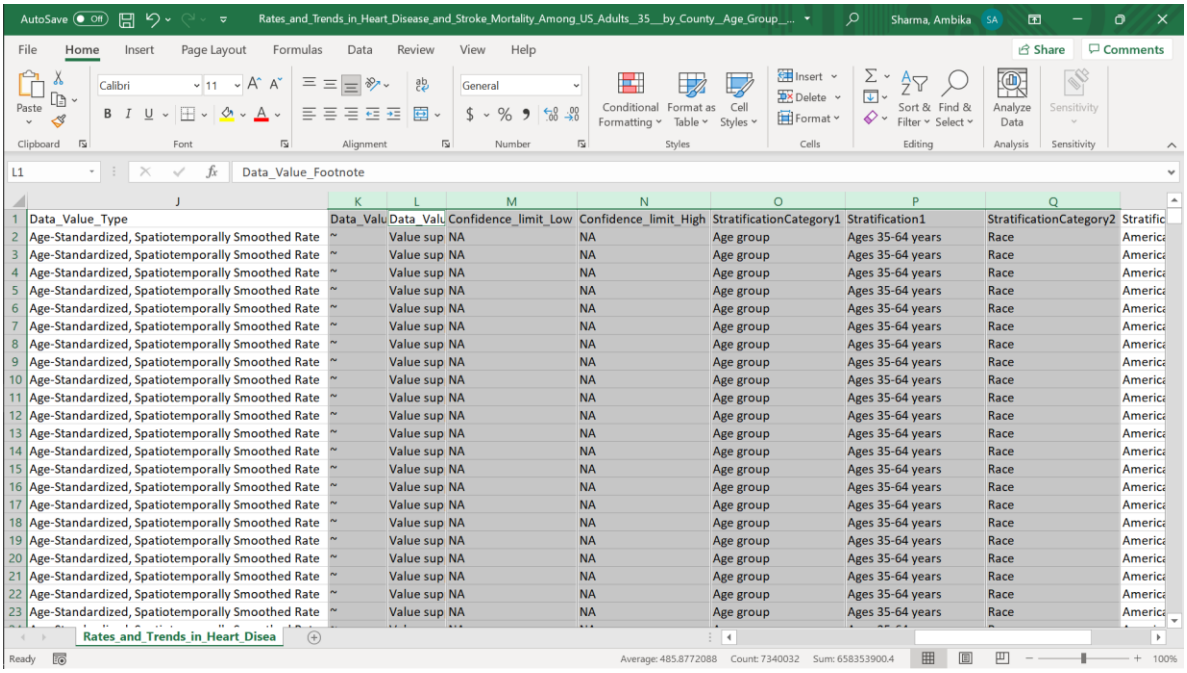
Further while data representation filtered the death count by excluding average value higher than 39,000 to get the exact count.



6. Missing Values/ Renaming Column (From Sheet 2/3)

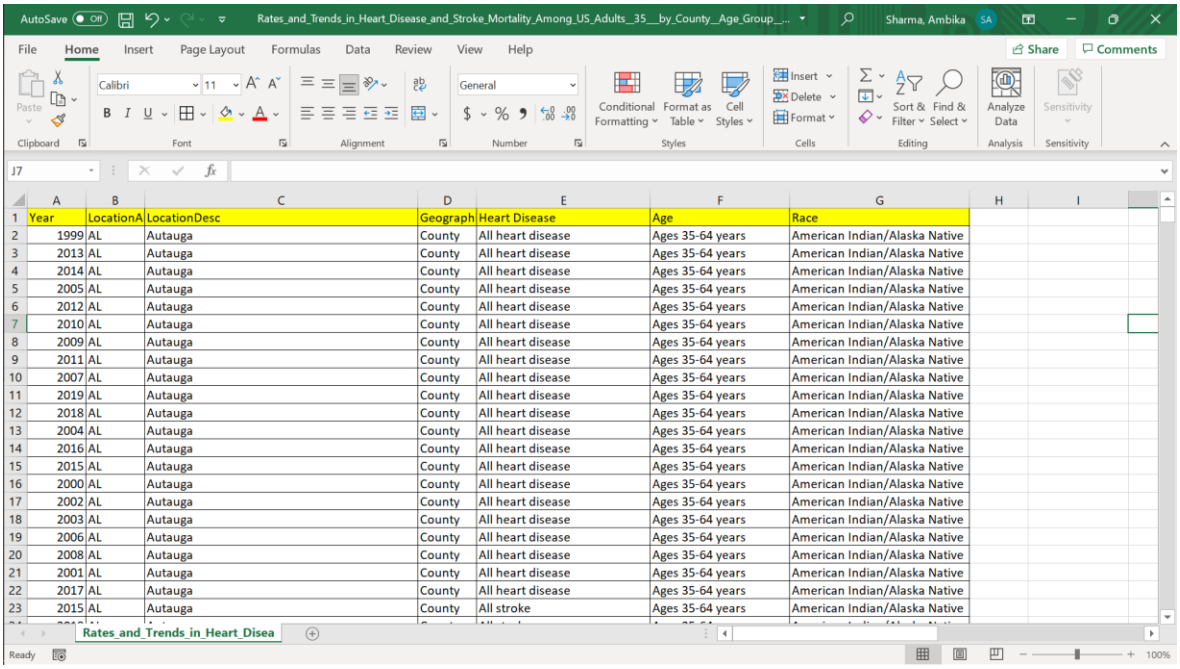
- PRE – CLEANING

There were several null values and columns



	J	K	L	M	N	O	P	Q	
1	Data_Value_Type	Data_Valu	Data_Valu	Confidence_limit_Low	Confidence_limit_High	StratificationCategory1	Stratification1	StratificationCategory2	Stratific
2	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
3	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
4	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
5	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
6	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
7	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
8	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
9	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
10	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
11	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
12	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
13	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
14	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
15	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
16	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
17	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
18	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
19	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
20	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
21	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
22	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America
23	Age-Standardized, Spatiotemporally Smoothed Rate	~	Value sup	NA	NA	Age group	Ages 35-64 years	Race	America

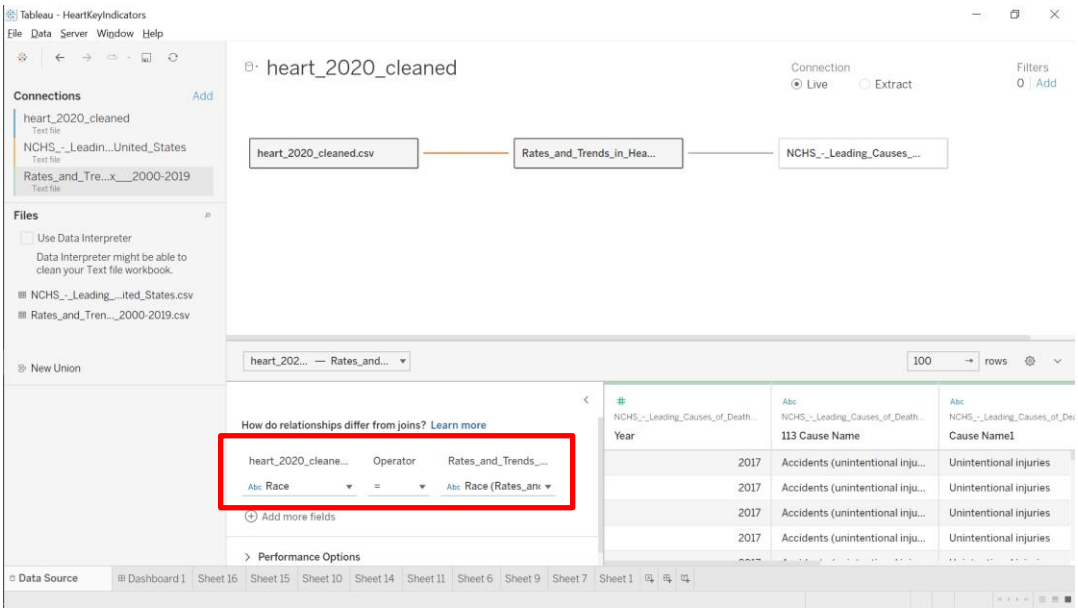
- POST – CLEANING



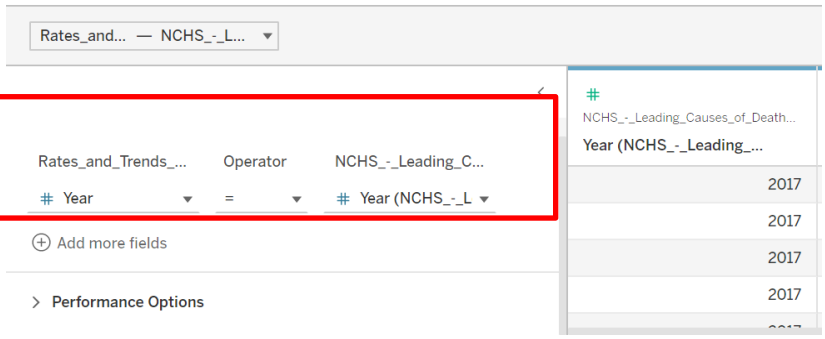
	A	B	C	D	E	F	G	H	I
1	Year	LocationA	LocationDesc	Geograph	Heart Disease	Age	Race		
2	1999	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
3	2013	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
4	2014	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
5	2005	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
6	2012	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
7	2010	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
8	2009	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
9	2011	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
10	2007	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
11	2019	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
12	2018	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
13	2004	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
14	2016	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
15	2015	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
16	2000	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
17	2002	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
18	2003	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
19	2006	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
20	2008	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
21	2001	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
22	2017	AL	Autauga	County	All heart disease	Ages 35-64 years	American Indian/Alaska Native		
23	2015	AL	Autauga	County	All stroke	Ages 35-64 years	American Indian/Alaska Native		

7. Union - Sheet 1, 2 and 3

Created a relationship – union in sheet 1 (Heart_2020_cleaned) and sheet 2 (Rates and Trends in heart disease) which have a common attribute(column) – Race.



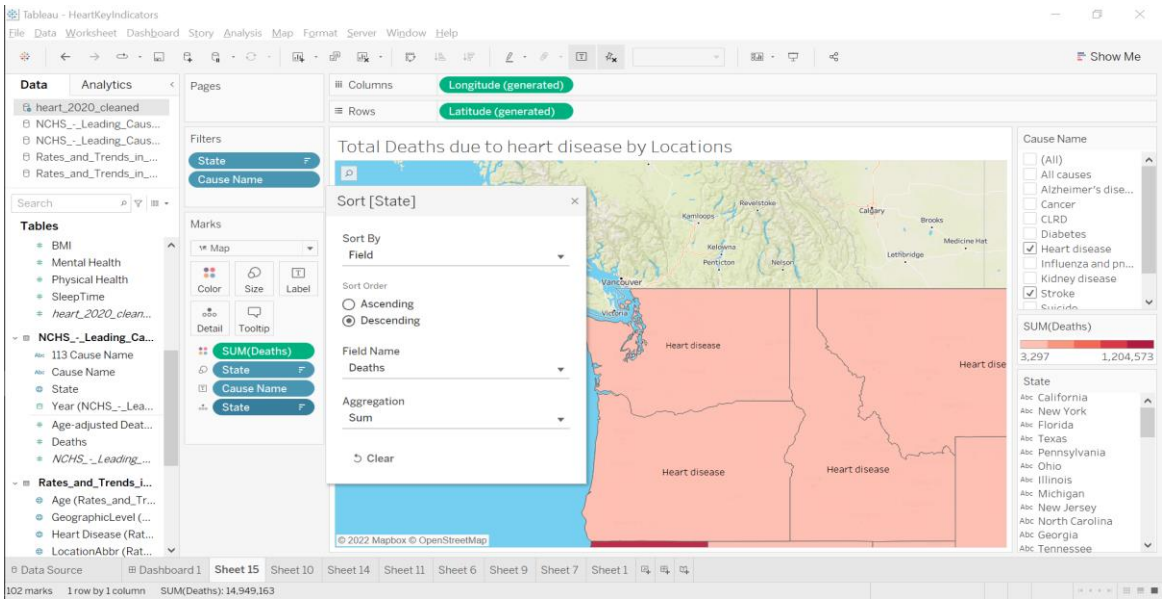
Created a relationship – union in sheet 2 (Rates and Trends in heart disease) and sheet 3 (NCHS_Leading_Causesofheartdisease) which have a common attribute(column) – Year.

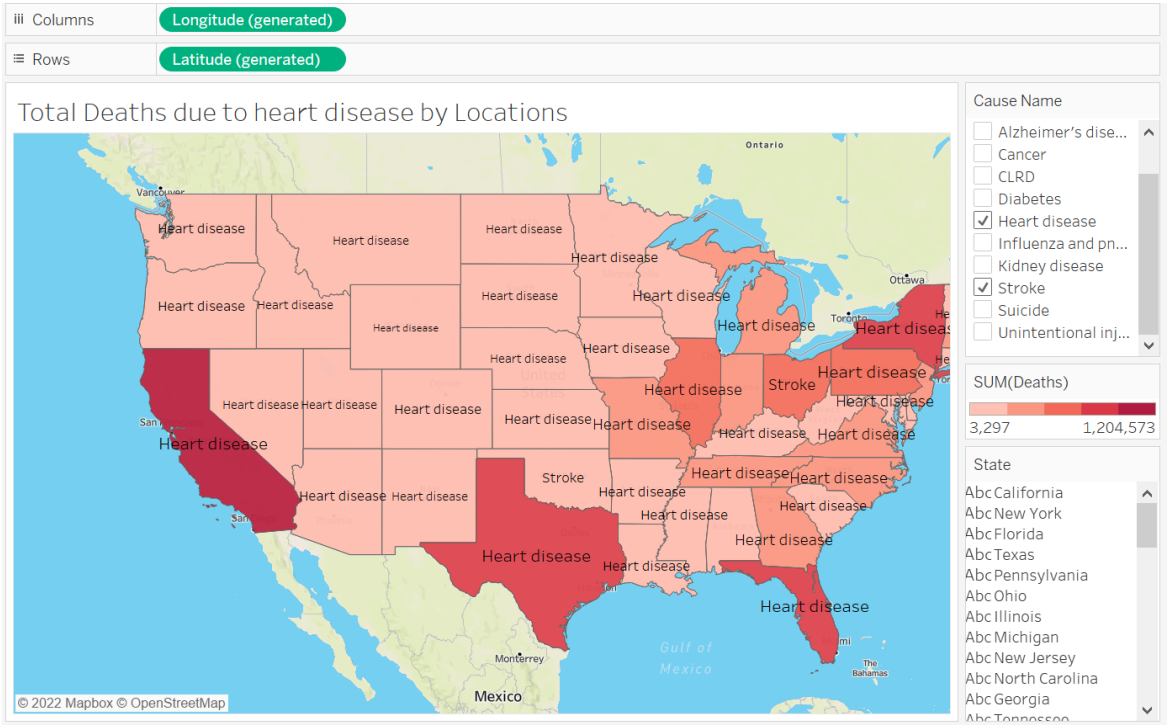


These union will help in depth data representation and calculation from several factors in the data.

DATA VISUALIZATION

1- What is the sum of deaths in different location in USA throughout year 2000 to 2017?

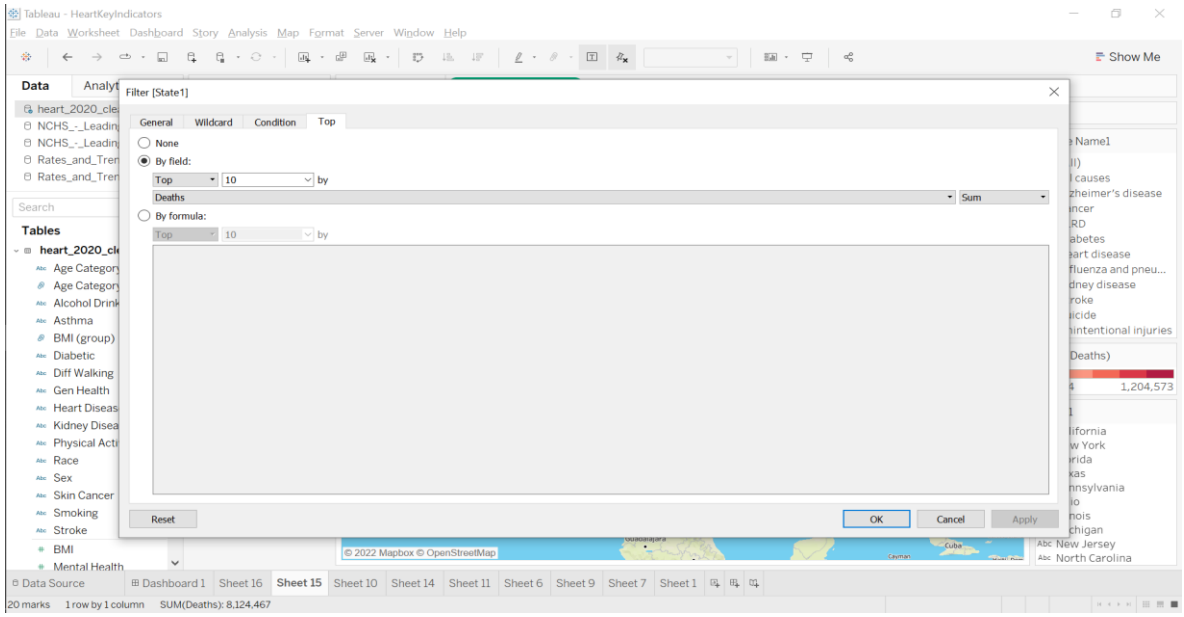




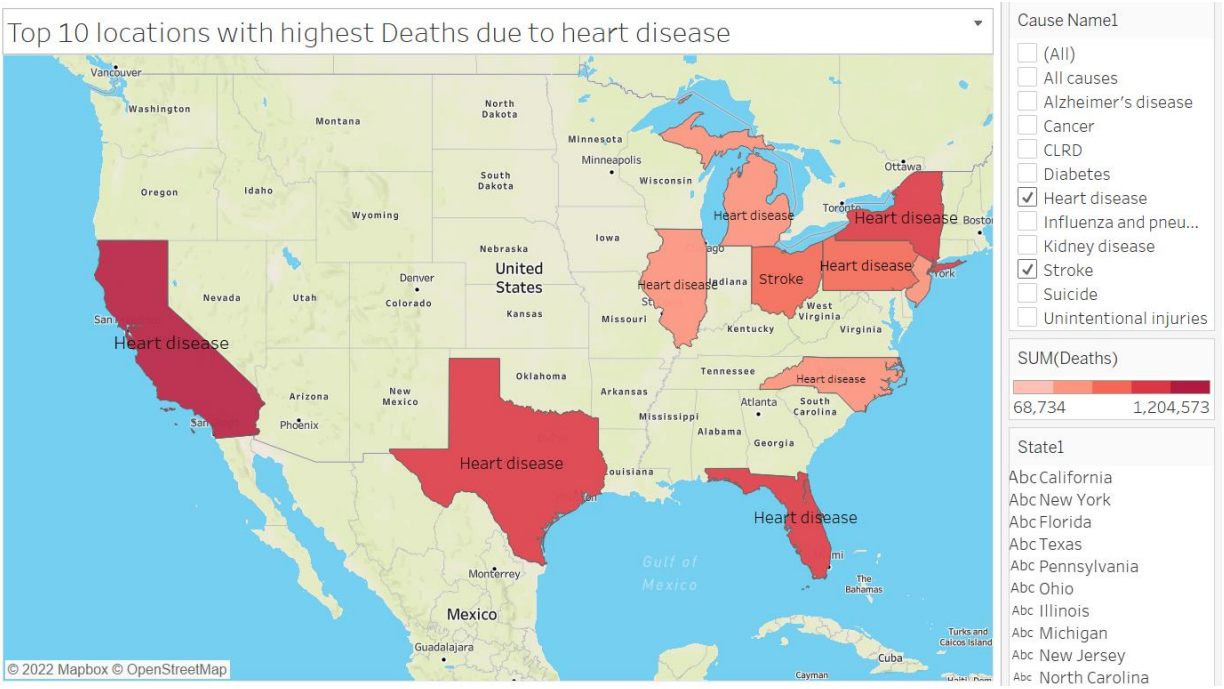
The **geographical representation** shows the total number of deaths from the year **2000 to 2017** which varies from **3,297 deaths to 1,204,573** deaths in 17 years. There are a few causes that cause

coronary illness and stroke. Stroke is a Cerebrovascular Disease, where a projected **7.0 million Americans ≥20 long** stretches of stage self-report suffered a heart attack, and the absolute stroke event was a projected 2.5%. In **2017, 1,204,573** resident deaths were enlisted in the United States. Ten first causes represented 74.1% of every single enrolled demise. The 10 principal reasons for death in 2017 were equivalent to in 2015: these incorporate **cancer, constant lower respiratory sicknesses, stroke, coronary illness/heart disease, flu and pneumonia, kidney illness, Alzheimer's illness, inadvertent wounds, DM, and self-destruction/suicide**. Seven of the 10 significant reasons for death had a decrease in age-changed passing rates. The age-changed passing rates diminished by **11.2% for flu and pneumonia, 1.7% for cancer, 1.4% for DM, 1.8% for coronary illness, 0.8% for stroke, 2.4% for constant lower respiratory infections, and 2.2% for kidney illness**. The age-changed rate expanded by **9.7% for inadvertent wounds, 3.1% for Alzheimer's infection, and 1.5% for self-destruction**.[2]

2- List the top 10 states of USA with highest death due to heart attack or stroke in the year 2000 to 2017?



[2] National Center for Health Statistics. Health, United States, 2015: With Special Feature on Racial and Ethnic Health Disparities. Hyattsville, MD: National Center for Health Statistics; 2015.



The above **geographical representation** discusses about the top 10 locations with highest death rates –

In a review populace-based study in northern California, **7% of youth ischemic strokes** what's more, **2% of youth hemorrhagic strokes** were owing to intrinsic heart surrenders.

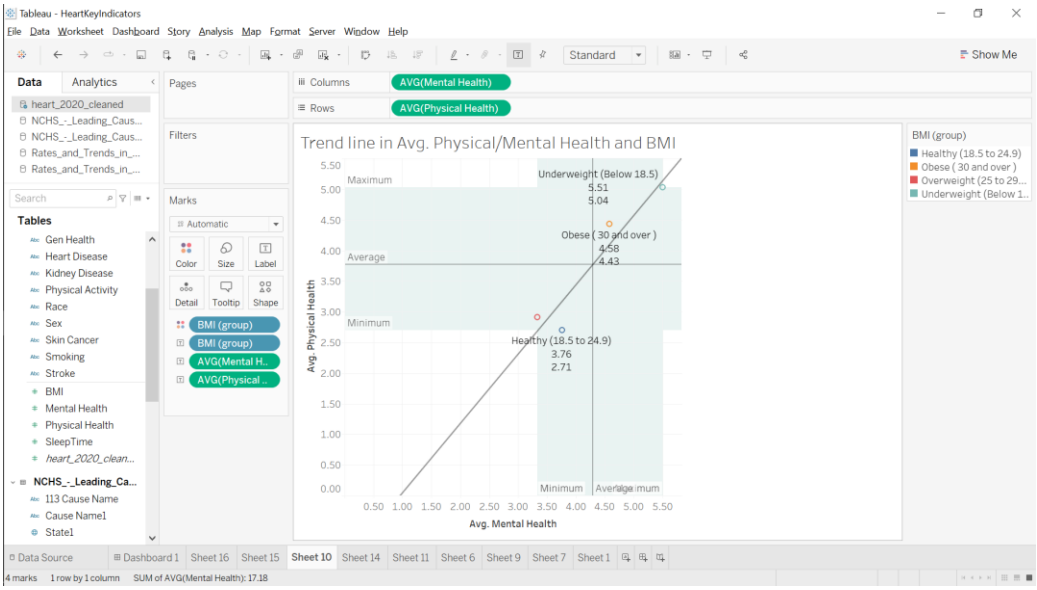
In one more instruction to the northern Californian populace, adolescents with headaches had a three - fold expanded chances of ischemic stroke contrasted and those without headache.

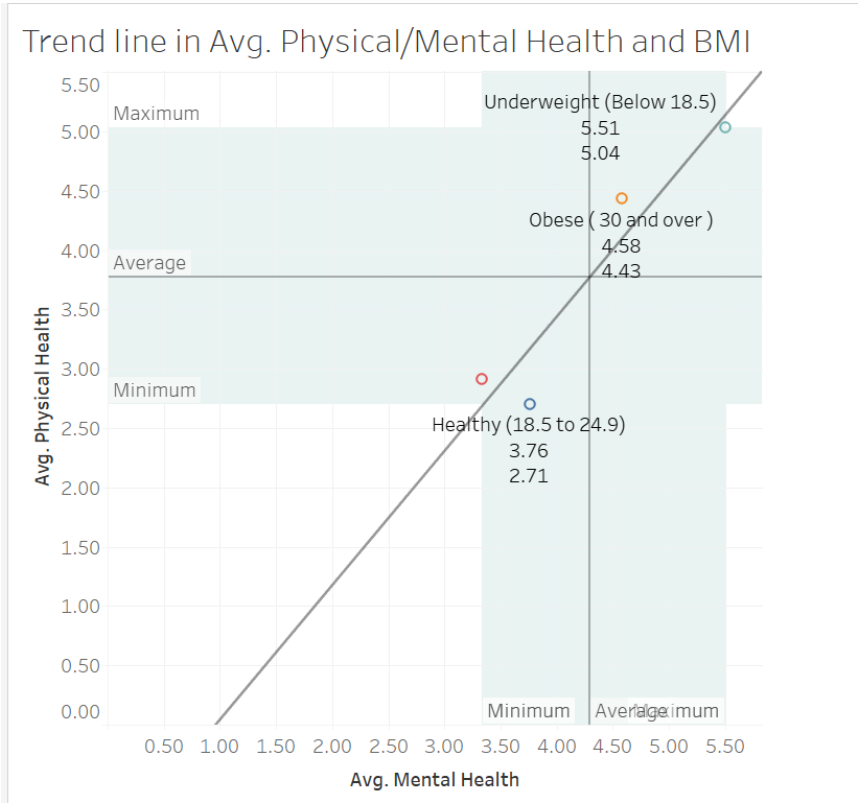
more youthful kids with headaches had no massive contrast in stroke risk. **California drove all with 1,204,573 with minimal passing in North Carolina with 68,734.**

The event of **perinatal strokes is 29 for every 100 000 live births or 1 for each 3500 live births in the 1997 to 2003** Kaiser Permanente of Northern California populace.[3]

[3] Agrawal N, Johnston SC, Wu YW, Sidney S, Fullerton HJ. Imaging data reveal a higher pediatric stroke incidence than prior US estimates.Stroke. 2009; 40:3415–3421.

3- How does mental and physical health impact the BMI of an individual ?





The **trend lines** represent - physical health, which includes physical illness and injury, during the past 30 days and mental health days during the past 30 days that was not good?

That shows result of **Underweight (below 18.5) BMI** has average mental health - 5.51 and average physical health 5.04 which is highest, whereas the people with **Healthy (18.5 to24.9)**

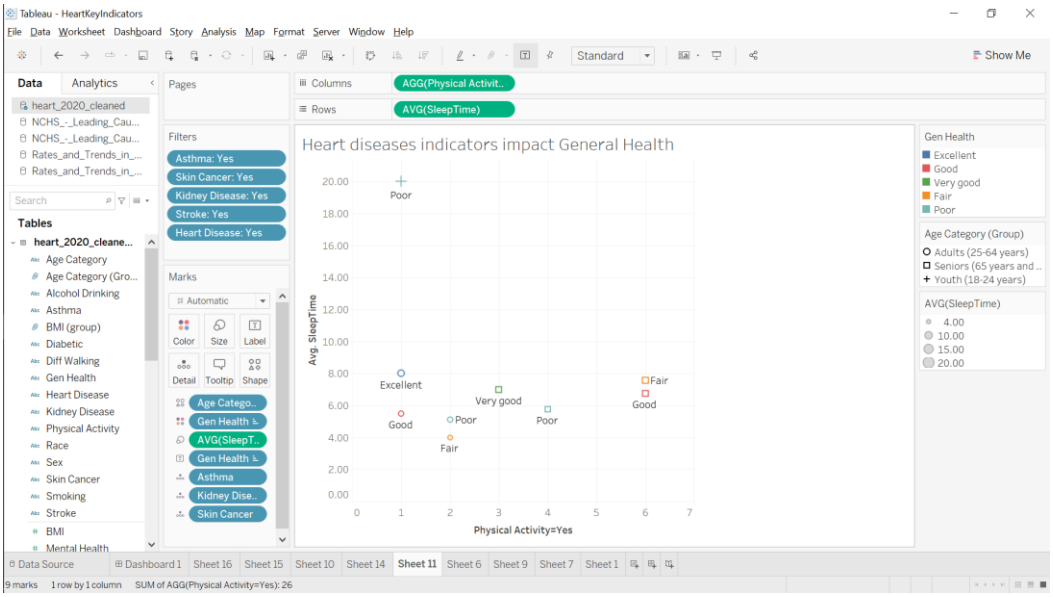
BMI has **3.76 days with mental illness and 2.71** in **average physical injuries in the past 30 days.** This shows that people within the **range of healthy BMI suffer from less physical and mental injuries in past 30 days.**

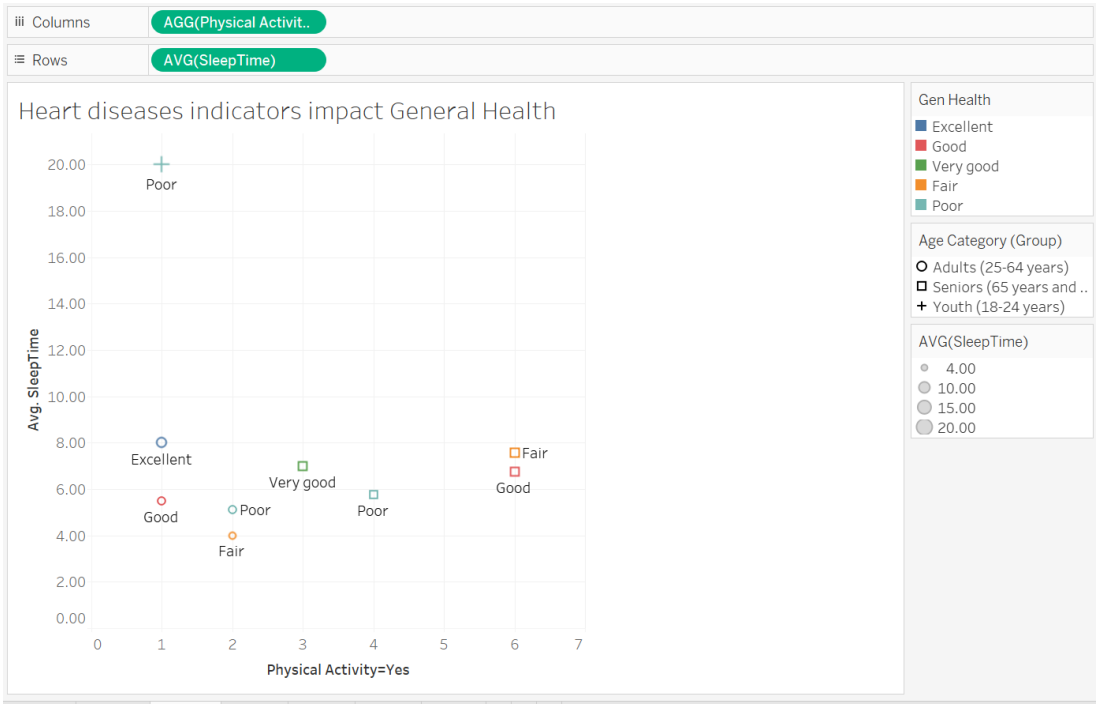
Trend Lines Model

A linear trend model is computed for average of Physical Health given average of Mental Health.

Model formula:	(Avg. Mental Health + intercept)
Number of modeled observations:	4
Number of filtered observations:	0
Model degrees of freedom:	2
Residual degrees of freedom (DF):	2
SSE (sum squared error):	0.387129
MSE (mean squared error):	0.193565
R-Squared:	0.901267
Standard error:	0.43996
p-value (significance):	0.0506491

4- How does heart disease indicators impact general health based on physical activity and average sleep time?



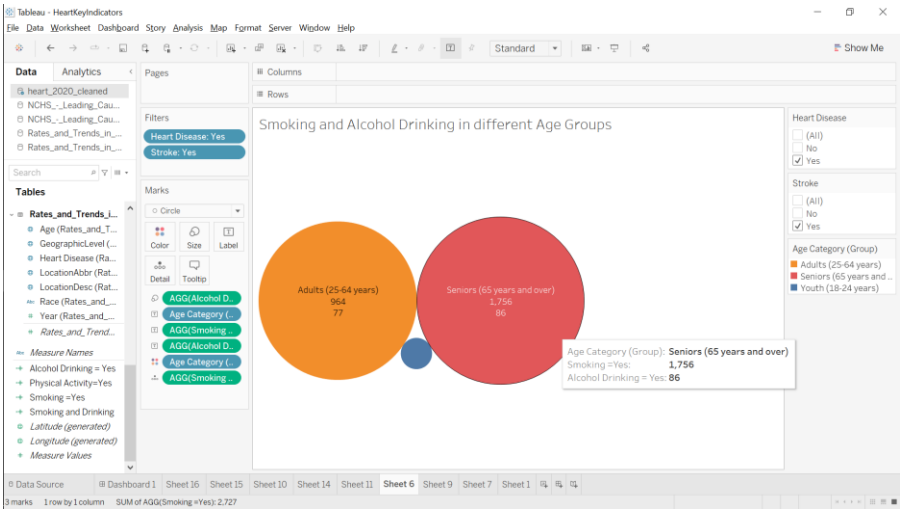


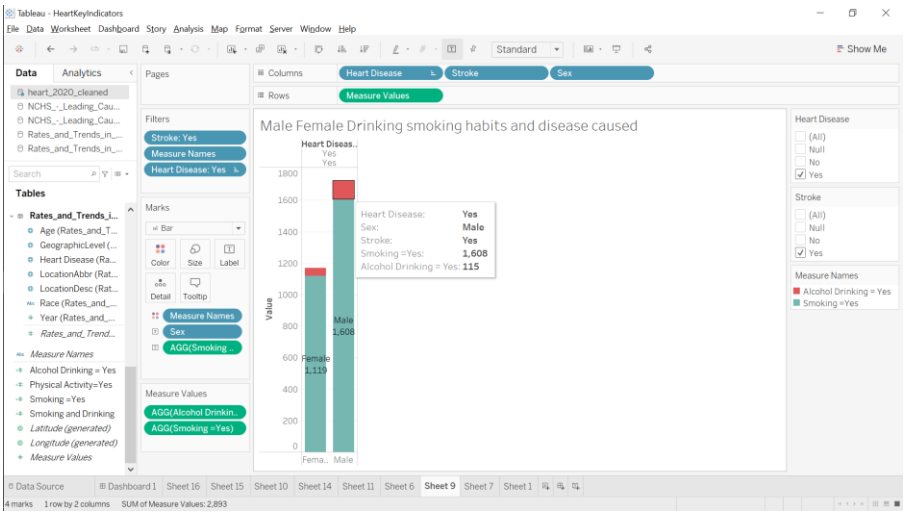
The trend lines discussed in Q- 2, states the physical injury in past 30 days, this graphs elaborates the impact of physical activity in the past 30 days and average sleep in a day.

The **scatter plot** shows – General health is **poor of a youth whose average sleep hours are 20 hours** with physical activity once in 30 days , whereas General Health is **excellent of adult who sleeps for 8 hours** with physical activity once in 30 days.

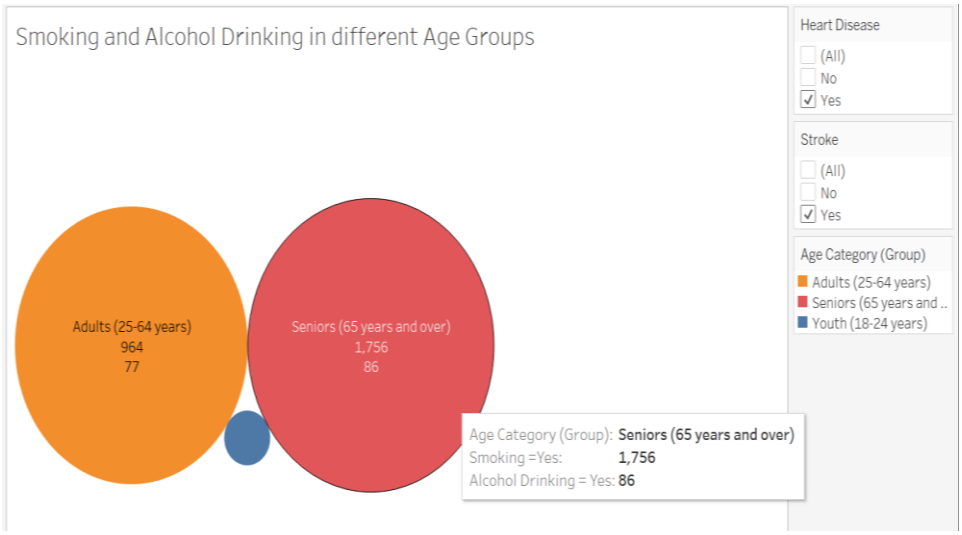
The effect of the metabolic condition on mortality has been demonstrated to be altered by objective rest length. In information from the Penn State Adult Cohort, a planned populace-based investigation of rest issues, impartially estimated short rest span (<6 hours) was related to expanded all-cause and CVD mortality, though rest ≥6 hours was not related with expanded all-cause or on the other hand CVD mortality among members with a metabolic condition.[4]

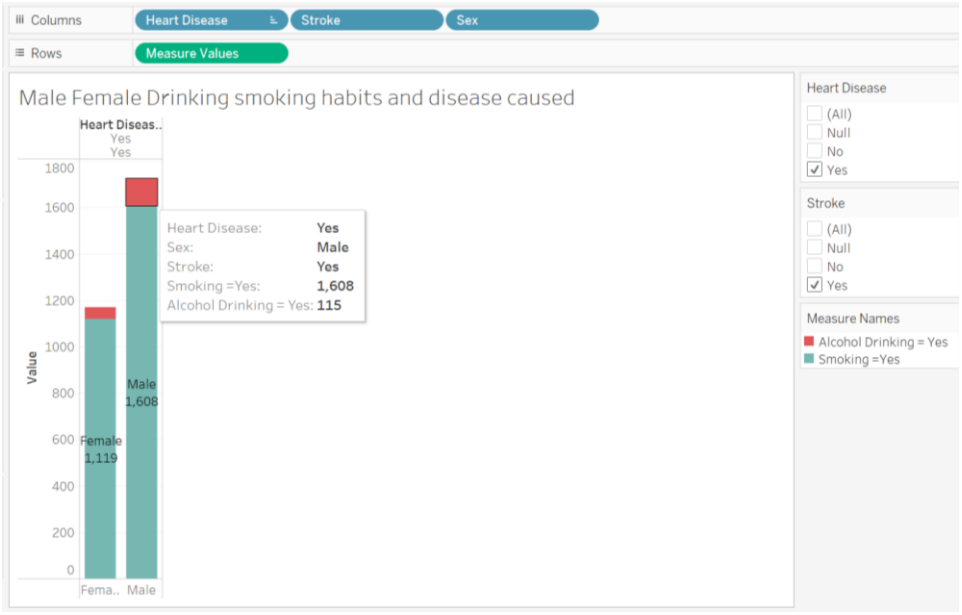
5- How does alcohol drinking, smoking impacts different age group and gender (resulting in heart disease or strokes)?





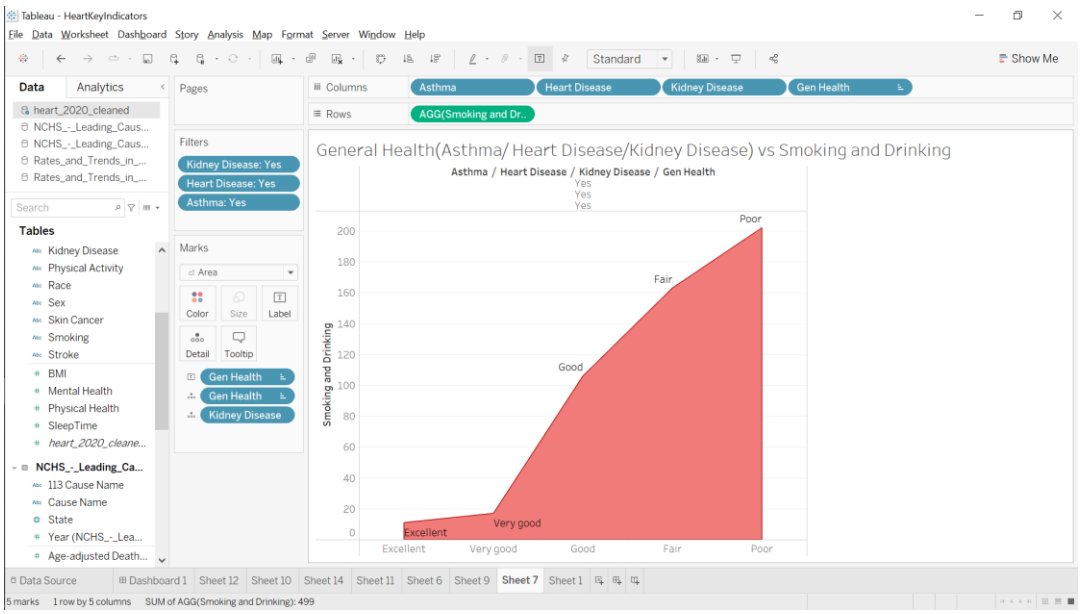
[4] Fernandez-Mendoza J, He F, LaGrotte C, Vgontzas AN, Liao D, Bixler EO. Impact of the metabolic syndrome on mortality is modified by objective short sleep duration [published correction appears in J Am Heart Assoc. 2017;6:e002182].J Am Heart Assoc. 2017; 6:e005479. doi: 10.1161/JAHA.117.005479

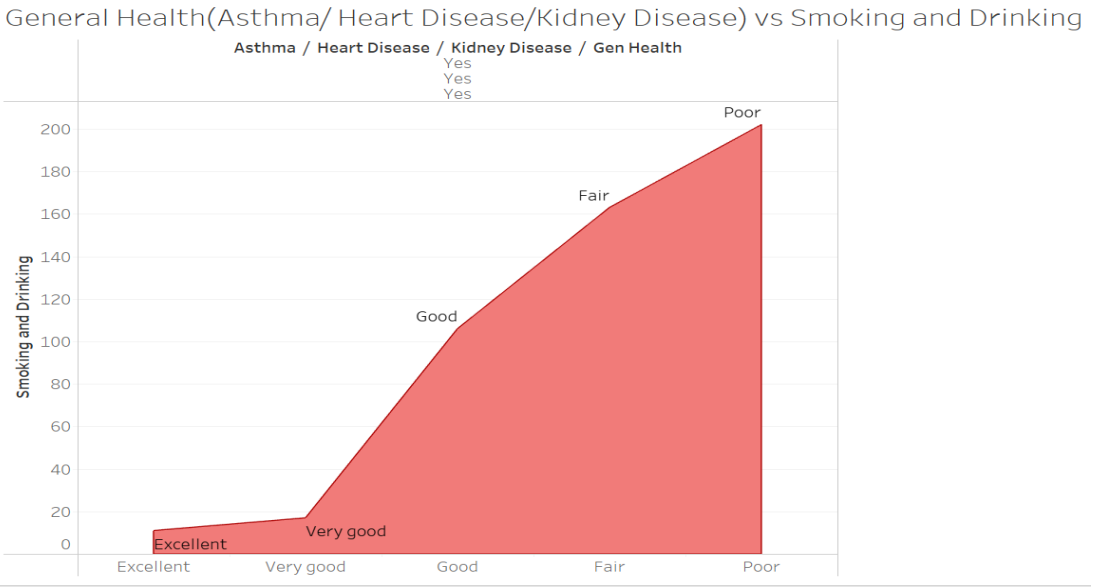




The **packed bubble graph** and **stacked bar graph** are filtered with heart and stroke disease of drinkers and smokers. In packed bubble chart **Senior are highest smokers with total 1756**, followed by their drinking habits – 86, which involves **1,608 male smokers** who have heart disease and already got a stroke , followed by **females – 1,119 smokers**. **Smoking** seems to be a major factor in lifestyle **be it a senior, male or female.**

6- What is the general health of people who drink and smoke inclusive of other hear disease?

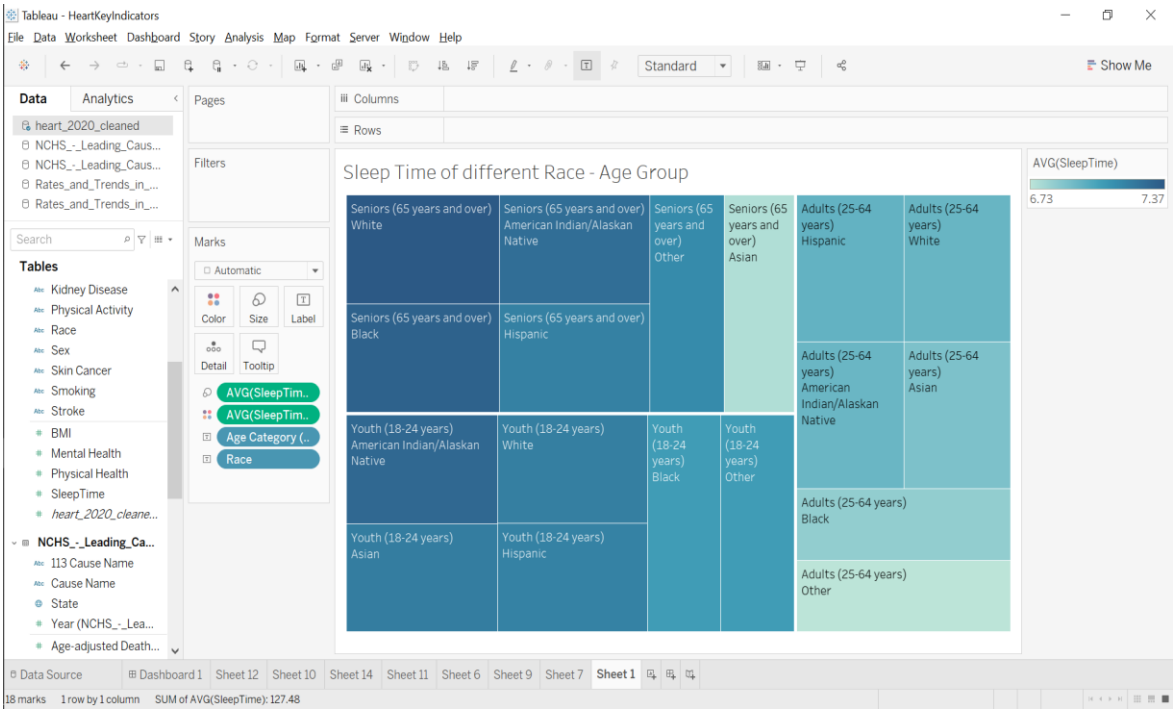


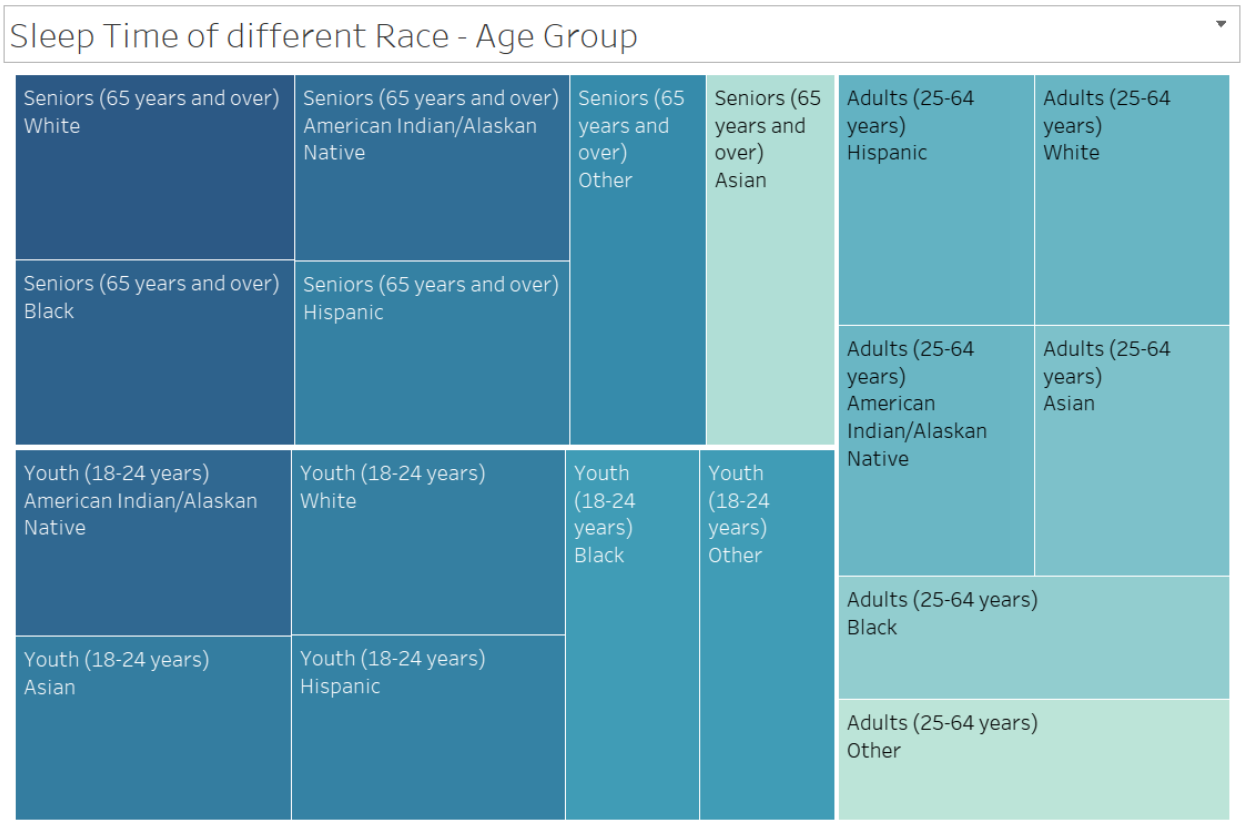


Asthma	Heart Disease	Kidney Disease	Gen Health	Smoking and Drinking
Yes	Yes	Yes	Excellent	11
Yes	Yes	Yes	Very good	17
Yes	Yes	Yes	Good	106
Yes	Yes	Yes	Fair	163
Yes	Yes	Yes	Poor	202

The **area graph** represents the general health of an individual who **smokes, and drink is generally poor (200)** that seems to be apt based on they already have asthma, heart disease and kidney disease.

7- What is the average sleep time of the different age group according to the different race?





The tree map shows normal rest time with the age and race of the individual. Rest can be portrayed in numerous ways, including the amount of (rest span), nature of rest, or the presence of a rest problem, like sleep deprivation or OSA. These attributes of rest have been related to CVD and stroke. The American Academy of Sleep Medicine and the Sleep Research Society distributed an agreement proclamation suggesting that **grown-ups acquire ≥7 long** stretches of rest each night to advance ideal wellbeing[5].

The information demonstrated that the age-changed predominance of sound rest span was lower **among Native Hawaiians/Pacific Islanders (53.7%), NH blacks (54.2%), multiracial NH individuals (53.6%), and American Indians/Alaska Natives (59.6%) contrasted and NH whites (66.8%), Hispanics (65.5%), and Asians (62.5%)**. From the tree map we see **White Senior(65 years or more)** have a solid lay down with a normal **sleep time of 7.37**.

[5] Liu Y, Wheaton AG, Chapman DP, Cunningham TJ, Lu H, Croft JB. Prevalence of healthy sleep duration among adults–United States, 2014.

DASHBOARD

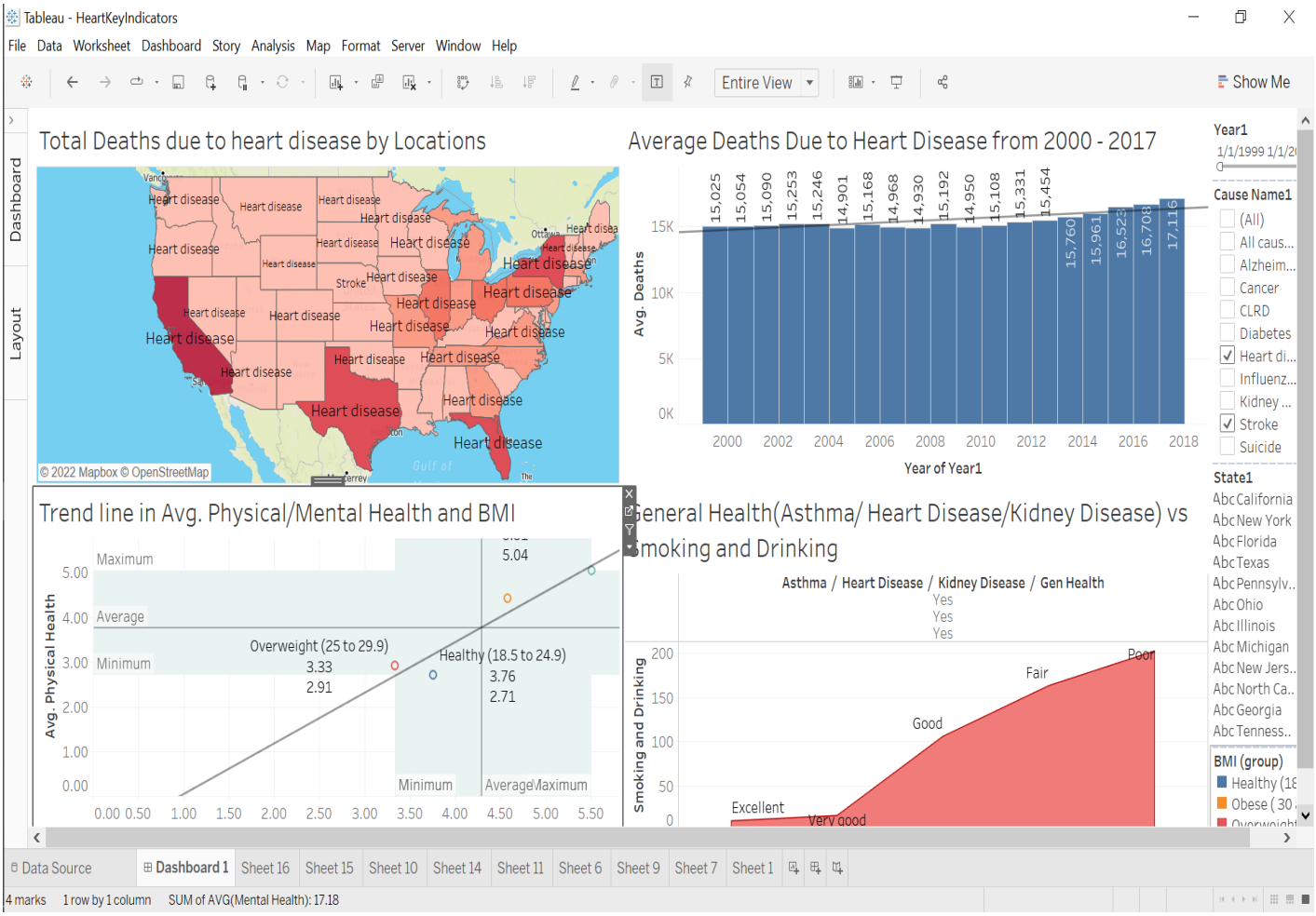
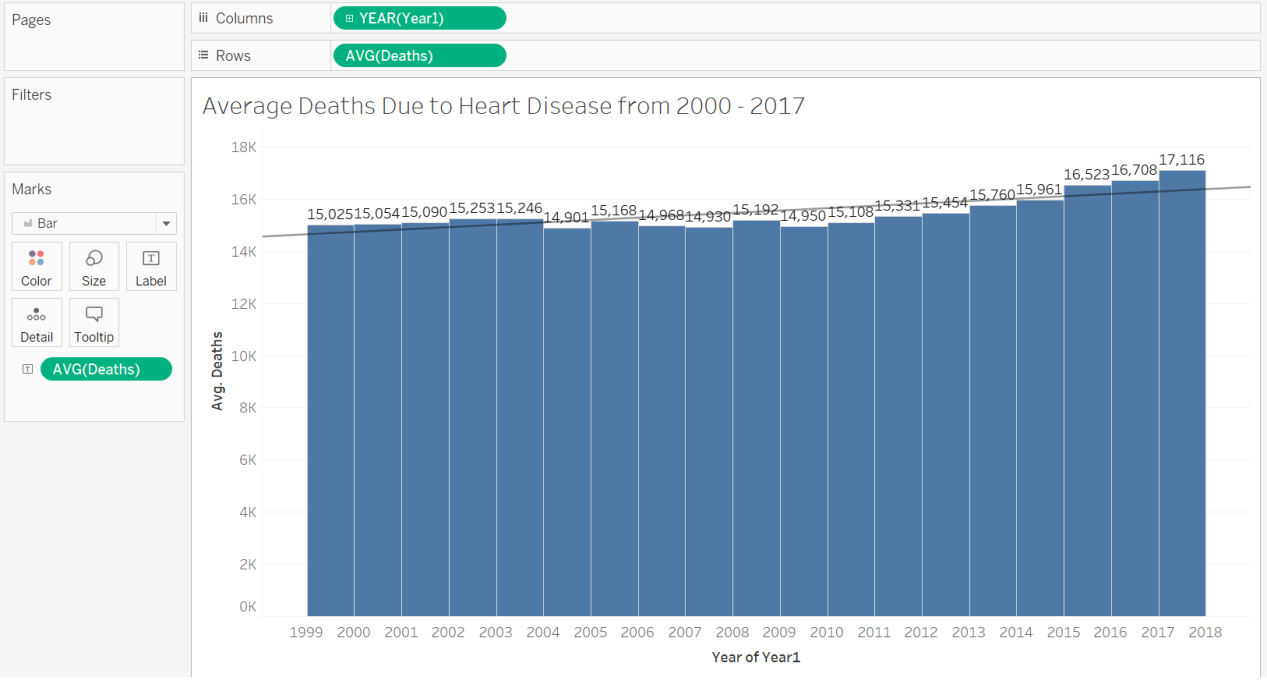


Tableau - HeartKeyIndicators
File Data Worksheet Dashboard Story Analysis Map Format Server Window Help
Entire View
Show Me
Dashboard
Layout
Total Deaths due to heart disease by Locations
Heart disease
Stroke
© 2022 Mapbox © OpenStreetMap
Average Deaths Due to Heart Disease from 2000 - 2017
Avg. Deaths
15K
10K
5K
0K
15,025
15,054
15,090
15,253
15,246
14,901
15,168
14,968
14,930
15,192
14,950
15,108
15,331
15,454
15,760
15,961
16,523
16,708
17,116
2000 2002 2004 2006 2008 2010 2012 2014 2016 2018
Year of Year1
Year1
1/1/1999 1/1/2
Cause Name1
(All)
All caus...
Alzheim...
Cancer
CLRD
Diabetes
Heart di...
Influenz...
Kidney ...
Stroke
Suicide
State1
Abc California
Abc New York
Abc Florida
Abc Texas
Abc Pennsylv..
Abc Ohio
Abc Illinois
Abc Michigan
Abc New Jers..
Abc North Ca..
Abc Georgia
Abc Tenness..
BMI (group)
Healthy (18
Obese (30
Trend line in Avg. Physical/Mental Health and BMI
Avg. Physical Health
Maximum
Average
Minimum
5.00
4.00
3.00
2.00
1.00
0.00
0.00 0.50 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50
Overweight (25 to 29.9)
3.33
2.91
Healthy (18.5 to 24.9)
3.76
2.71
5.04
Minimum
Average
Maximum
General Health(Asthma/ Heart Disease/Kidney Disease) vs Smoking and Drinking
Asthma / Heart Disease / Kidney Disease / Gen Health
Yes
Yes
Yes
Smoking and Drinking
200
150
100
50
0
Excellent
Very good
Good
Fair
Poor
Data Source
Dashboard 1
Sheet 16
Sheet 15
Sheet 10
Sheet 14
Sheet 11
Sheet 6
Sheet 9
Sheet 7
Sheet 1
4 marks
1 row by 1 column
SUM of AVG(Mental Health): 17.18



The new bar graph visual examines the quantity of normal passing each year from the **year 1999 - 2000** to **2017-2018** going from **15,025 to 17,116**. The passing rates have expanded over the number of years. The age-changed stroke passing rate **diminished by 16.7%** (from 44.8 per 100 000 to 37.3 per 100 000), while the genuine number of stroke passing **expanded by 3.7%** (from 137 119 passing to 142 142 passing). The decrease in age-changed stroke **passing rates for males and females was comparable**. Age-changed stroke passing rates declined by ≈14% or more among all racial/ethnic gatherings; be that as it may, in 2016, **rates stayed higher among NH blacks** (51.9 per 100 000; change beginning around 2006: −19.3%) than **among NH whites** (36.1 per 100 000; −15.9%), **NH Asians/Pacific Islanders** (31.0 per 100 000; −21.5%), **NH American Indians/Alaska Natives** (30.7 per 100 000; −20.7%), and **Hispanics** (32.1 per 100 000; −13.7%).[6]

[6] Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying cause of death, 1999-2016. CDC WONDER Online Database [database online]. Released January 2013.Atlanta, GA: Centers for Disease Control and Prevention. https://wonder.cdc.gov/ucd-icd10.html. Accessed March 13, 2018.

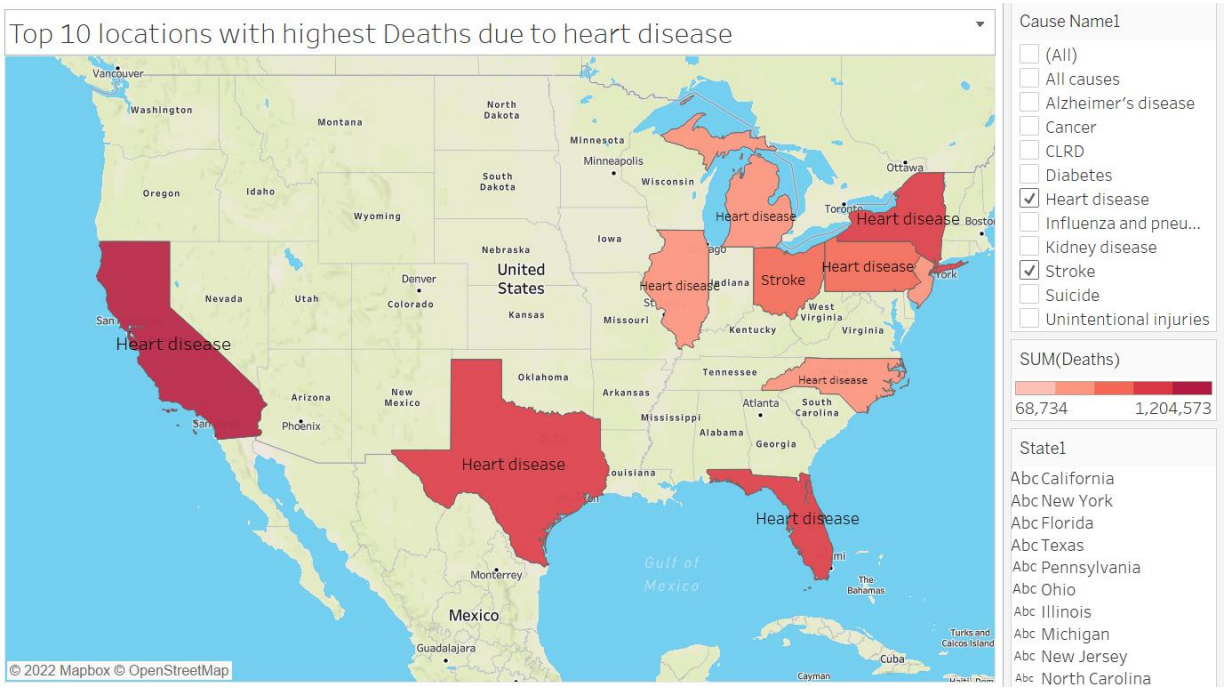
STORY TELLING

Heart Disease is the main source of death for individuals of most racial and ethnic gatherings in the United States, including Alaska Native, Hispanic, African American, American Indian, and white men. For ladies from the Pacific Islands and American Indian, Alaska Native, Asian American, and Hispanic ladies, coronary illness is second just to cancer.[7] Coronary illness is a significant issue across each state and orientation in the United States. Treatment for coronary illness cost the medical care industry north of **444 billion dollars in 2010**. A few significant discoveries from the information above.

- Heart disease is the **main source of death** for men, ladies, and individuals of most racial and ethnic gatherings in the United States.
- One individual passes **every 36 seconds** in the United States from cardiovascular illness.
- Around **659,000 individual in the United States** die from heart disease each year—that's **1 in every 4 deaths**.
- Coronary illness costs the United States about **$363 billion** each year from 2016 to 2017. This incorporates the expense of medical care administrations, medications, and lost usefulness because of death.
- In the United States, somebody has a **heart attack every 40 seconds**.
- Every year, about **805,000 people** in the United States have a respiratory attack. Of these,
    - ***605,000 are a first heart attack***
    - ***200,000 happen to people to previously had a heart attack***
    - About ***1 in 5 heart*** attacks is quiet - the damage is done, but the person is unaware of it.

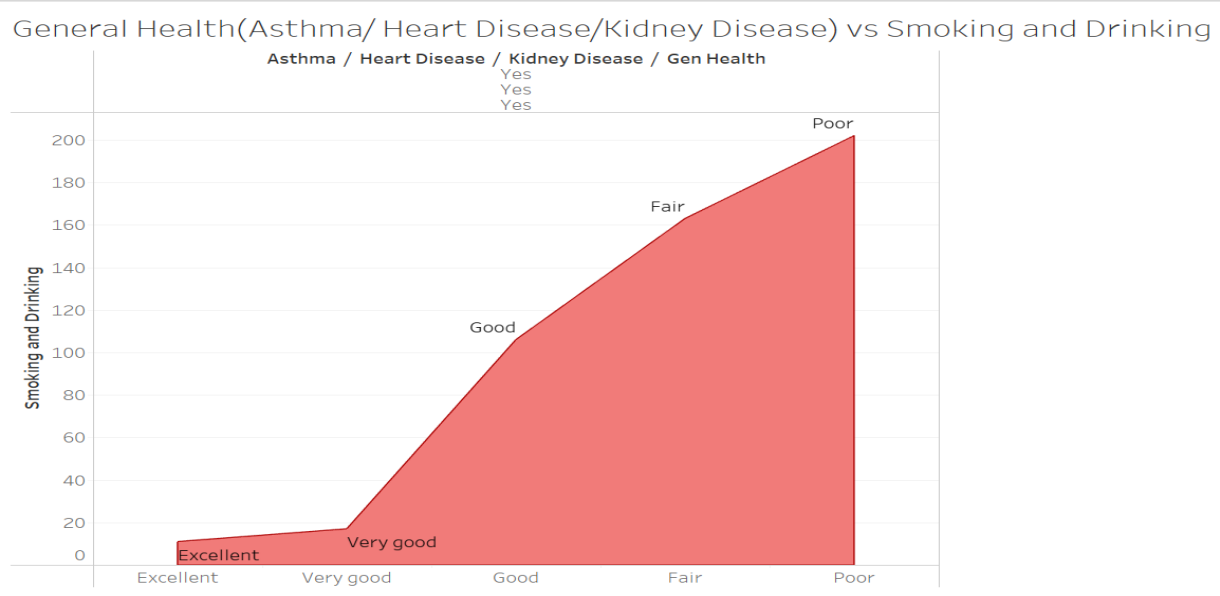
[7] Heron, M. Deaths: Leading causes for 2017pdf icon. National Vital Statistics Reports;68(6). Accessed November 19, 2019.

Caption 1- where we see the maximum deaths from year 2007 to 2017, where the major factor of death was Stroke and Heart Disease.



In a review populace-based study in northern California, **7% of youth ischemic strokes** what's more, **2% of youth hemorrhagic strokes** were owing to intrinsic heart surrenders. In one more instruction to the northern Californian populace, adolescents with headaches had a three - fold expanded chances of ischemic stroke contrasted and those without headache. more youthful kids with headaches had no massive contrast in stroke risk. **California drove all with 1,204,573 with minimal passing in North Carolina with 68,734.** The event of **perinatal strokes is 29 for every 100 000 live births or 1 for each 3500 live births in the 1997 to 2003** Kaiser Permanente of Northern California populace

Caption 2- What can be the several reason behind heart disease or the indicators that one can work on early to recover at an initial stage -



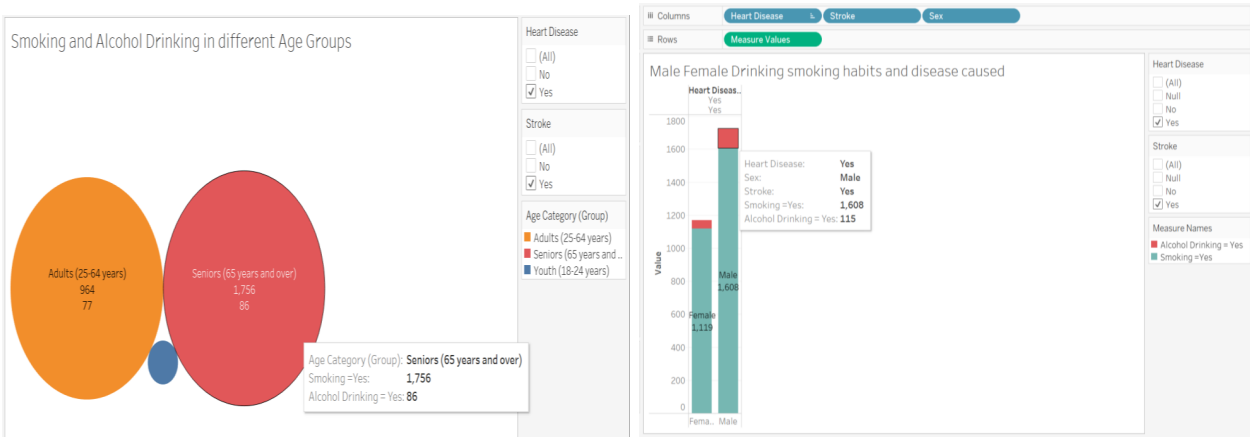
Asthma	Heart Disease	Kidney Disease	Gen Health	Smoking and Drinking
Yes	Yes	Yes	Excellent	11
Yes	Yes	Yes	Very good	17
Yes	Yes	Yes	Good	106
Yes	Yes	Yes	Fair	163
Yes	Yes	Yes	Poor	202

Liquor and tobacco utilization both critically affect cardiovascular risk factors. By and large, the two for the most part don't influence similar risk factors similarly, although degrees of circulatory strain and fatty oils (i.e., fats in the blood) might be significant special cases. Liquor utilization of at least **three beverages** each day plainly raises the pulse, one of the main cardiovascular risk factors. Subsequently, purchasers of three to **five beverages each day** have an approximately 50 percent higher risk of hypertension (i.e., hypertension); risk increments considerably more with heavier admission.[8]

[8] KLATSKY, A.L. Alcohol and hypertension. Clinica Chimica Acta 246:91–105, 1996. PMID: 8814973

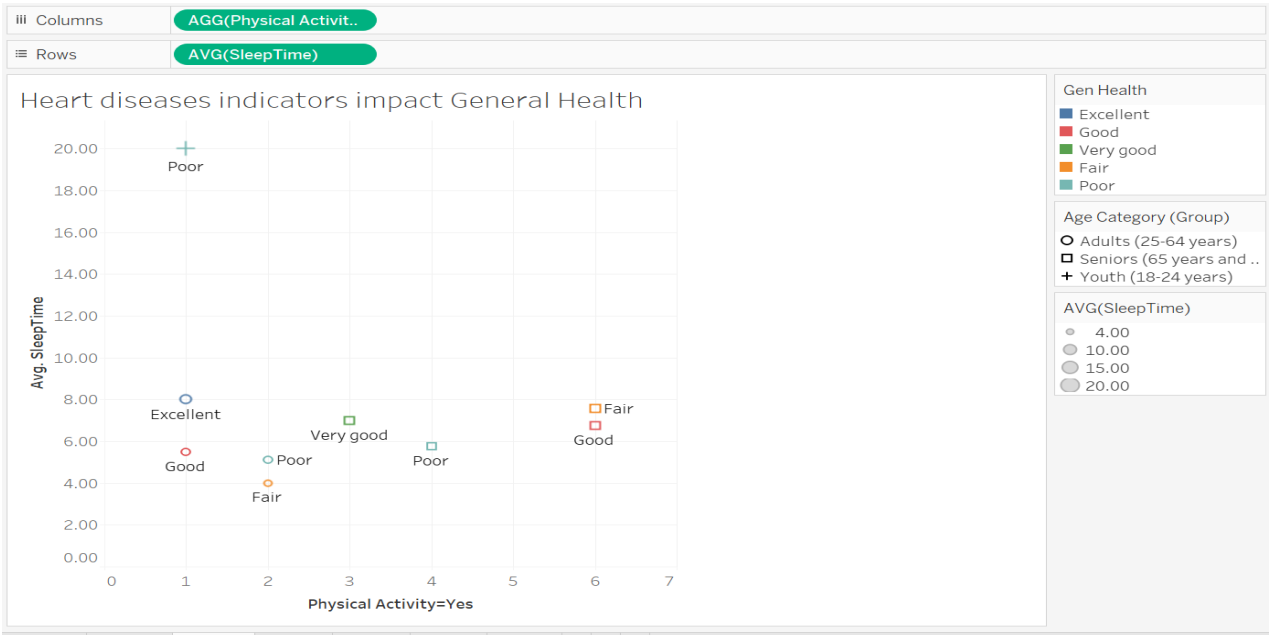
Caption 3- What age group and gender are mostly indulged in activities like smoking and drinking?

From our data representation we were able to figure out the seniors and males are heavily into smoking, which is one of the key factor of heart disease.



On average, **male smokers die 12 years prior than male non-smokers**, and **female smokers die 11 years prior than female non-smokers**. [9]A meta-analysis of 75 cohort studies (≈2.4 million individuals) demonstrated a **25% greater risk for CHD** in female smokers than in male smokers.

Caption 4- What actions can one take in initial stage to prevent heart diseases ?

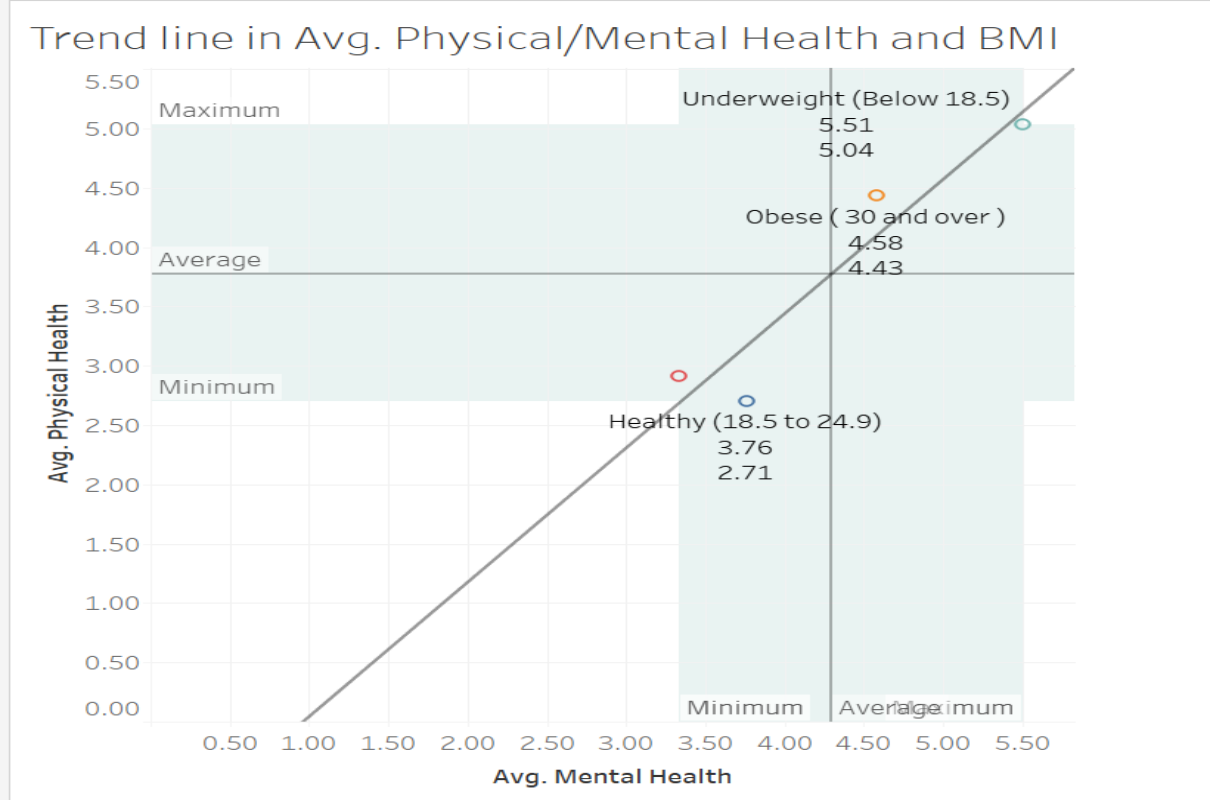


[9] Huxley RR, Woodward M. Cigarette smoking as a risk factor for coronary heart disease in women compared with men: a systematic review and meta-analysis of prospective cohort studies. Lancet. 2011;

The **scatter plot** shows – General health is **poor of a youth whose average sleep hours are 20 hours** with physical activity once in 30 days , whereas General Health is **excellent of adult who sleeps for 8 hours** with physical activity once in 30 days.

The oxygen-consuming rules of the **2008 Federal Physical Activity Guidelines** for Americans suggest participating in moderate recreation time active **work for ≥150 min/week** or **enthusiastic movement ≥75** min/week or an identical mix. The effect of metabolic disorder on mortality has been demonstrated to be adjusted by genuine rest span. Information from the Penn State Adult Cohort, an imminent populace-based investigation of rest problems, impartially estimated short rest span (<6 hours) was related to expanded all-cause and CVD mortality, while rest ≥6 hours was not related to expanded all-cause or CVD mortality among members with a metabolic disorder.

Caption 5 - Range of BMI – healthy lifestyle impact on heart disease -



Trend line depicts the result of **Underweight (below 18.5) BMI** has average mental health - 5.51 and average physical health 5.04 which is highest, whereas the people with **Healthy (18.5 to24.9) BMI** has 3.76 days with mental illness and 2.71 in average physical injuries in the past 30

days. This shows that people within the **range of healthy BMI suffer from less physical and mental injuries in past 30 days.** ***Weight is among the main sources of raised cardiovascular illness*** (CVD) mortality and grimness. the relationship between the expansion in weight file (BMI) and the expanded paces of CVD and hypertension (HBP) in the provinces of Louisiana, Mississippi, Alabama, Tennessee, and Colorado are inspected utilizing relapse examination and through brain network models for heftiness and HBP. **Cardiovascular sickness (CVD) mortality and dreariness (morbidity)** have been demonstrated to be raised in people who are overweight, especially with a focal affidavit of fat tissues. **Stomach weight** has been demonstrated to be a risk factor for CVD around the world.

Corpulence might be related to diabetes, insulin obstruction, hypertension, dyslipidemia, and raised degrees of fibrinogen and C-responsive protein, all of which increment the risk of CVD occasions.

What's more, the sensational expansion in the extent of youthful patients with serious stoutness summons the requirement for more upstream mediations for the essential counteraction and better therapy of corpulence as a chronic disease.[10]

Steps you can take to get healthy ***are to lose weight, start a healthy diet, restrict the consumption of alcohol and smoking, have proper sleep, give your body rest both mentally and physically, be more active physically*** and diminish your risk of creating coronary illness.

The main thing any fat individual, particularly those with a family background of cardiovascular sickness, ought to do to ***get sound is to work out consistently and eat a nutritious, adjusted diet***. Talk with your primary care physician about making an ***eating routine and exercise plan*** that turns out best for you considering your present objectives and well-being status.

STAY HEALTHY, STAY FIT.

[10] Rodriguez Flores M, Aguilar Salinas C, Piché ME, Auclair A, Poirier P. Effect of bariatric surgery on heart failure.**Expert Rev Cardiovasc Ther**. 2017

REFERENCES

[1] Agency for Healthcare Research and Quality. Healthcare Cost and Utilization Project (HCUP).Accessed April 1, 2020.

[2] National Center for Health Statistics. Health, United States, 2015: With Special Feature on Racial and Ethnic Health Disparities. Hyattsville, MD: National Center for Health Statistics; 2015.

[3] Agrawal N, Johnston SC, Wu YW, Sidney S, Fullerton HJ. Imaging data reveal a higher pediatric stroke incidence than prior US estimates.Stroke. 2009; 40:3415–3421.

[4] Fernandez-Mendoza J, He F, LaGrotte C, Vgontzas AN, Liao D, Bixler EO. Impact of the metabolic syndrome on mortality is modified by objective short sleep duration [published correction appears in J Am Heart Assoc. 2017;6:e002182].J Am Heart Assoc. 2017; 6:e005479. doi: 10.1161/JAHA.117.005479

[5] Liu Y, Wheaton AG, Chapman DP, Cunningham TJ, Lu H, Croft JB. Prevalence of healthy sleep duration among adults–United States, 2014.

[6] Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying cause of death, 1999-2016. CDC WONDER Online Database [database online]. Released January 2013.Atlanta, GA: Centers for Disease Control and Prevention. https://wonder.cdc.gov/ucd-icd10.html. Accessed March 13, 2018.

[7] Heron, M. Deaths: Leading causes for 2017pdf icon. National Vital Statistics Reports;68(6). Accessed November 19, 2019.

[8] KLATSKY, A.L. Alcohol and hypertension. Clinica Chimica Acta 246:91–105, 1996. PMID: 8814973

[9] Huxley RR, Woodward M. Cigarette smoking as a risk factor for coronary heart disease in women compared with men: a systematic review and meta-analysis of prospective cohort studies. Lancet. 2011;

[10] Rodriguez Flores M, Aguilar Salinas C, Piché ME, Auclair A, Poirier P. Effect of bariatric surgery on heart failure.**Expert Rev Cardiovasc Ther**. 2017