



Medical Insurance

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Our Dataset: 2.7K rows, 7 columns



Age

Person's Age

1

2

Children

Number of Children

Gender

Person's Gender

3

4

Smoker

Yes or no if smoker or non-smoker

BMI

Body Mass Index

5

6

Region

Divided into 4 regions, northwest, northeast, southwest, southeast

7

Charges

Insurance Price



How do various factors influence the costs of medical insurance?

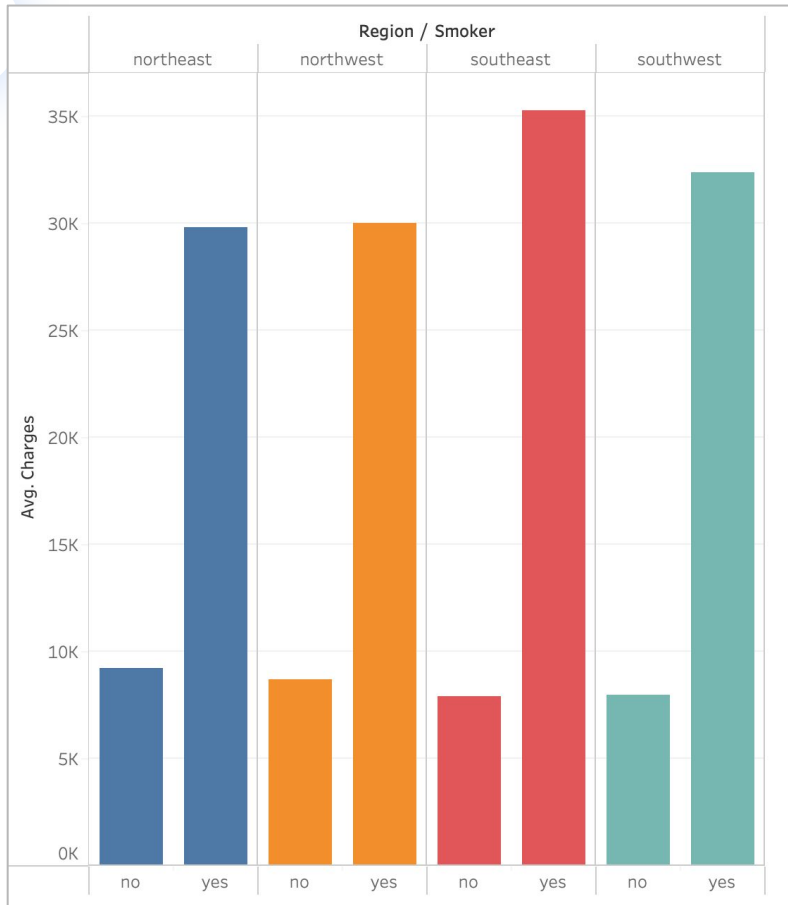


01

Region & Smoking

How do average insurance costs vary for smokers (and non-smokers) in different geographical regions?





Region & Smoking

\$35,262

Southeast

Highest insurance costs for smokers relative to other regions

\$8,418

Non-Smokers

Average cost of insurance across all regions

02

BMI & Smoking

How do average insurance costs vary based on BMI levels and smoking status?



BMI + Smoking

Weight Category	Body Mass Index (BMI)
underweight	< 18.5
healthy	18.5 - 24.9
overweight	25 - 29.9
obese	>30

Non-Smokers: 38 BMI

30%

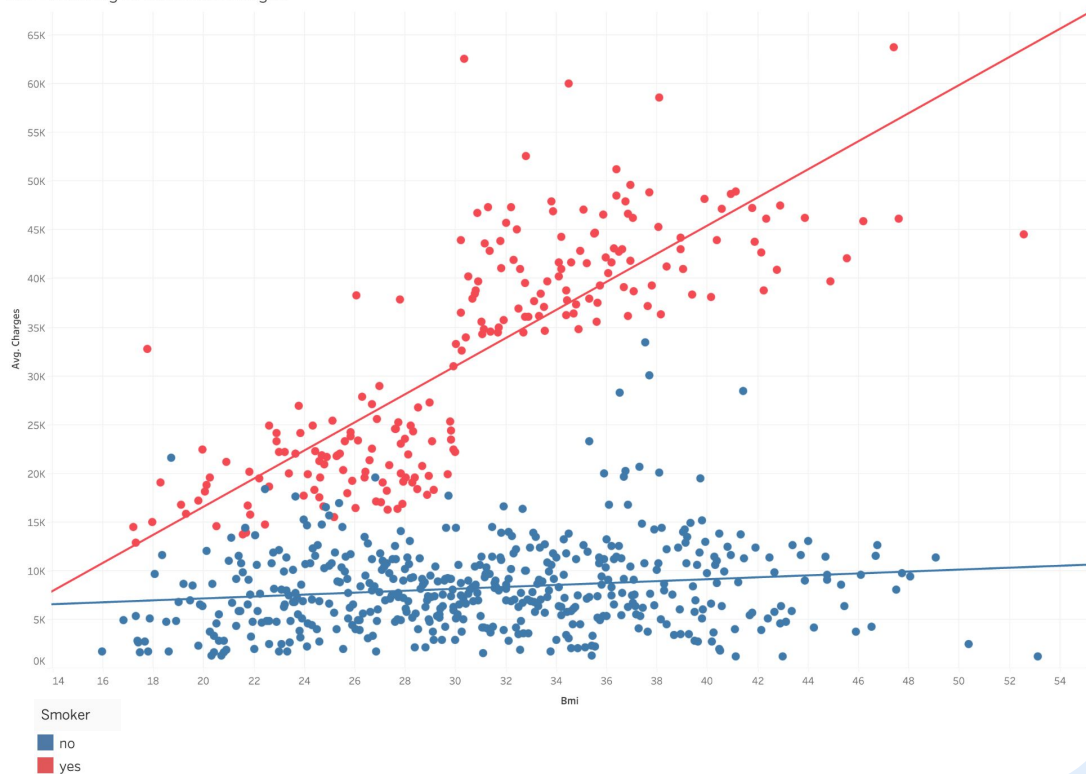
increase in insurance
cost from a healthy
BMI to an obese BMI

Smokers: 30 BMI

150%

increase in insurance cost
from a healthy BMI to an
overweight BMI

BMI + Smoking vs Insurance Charges

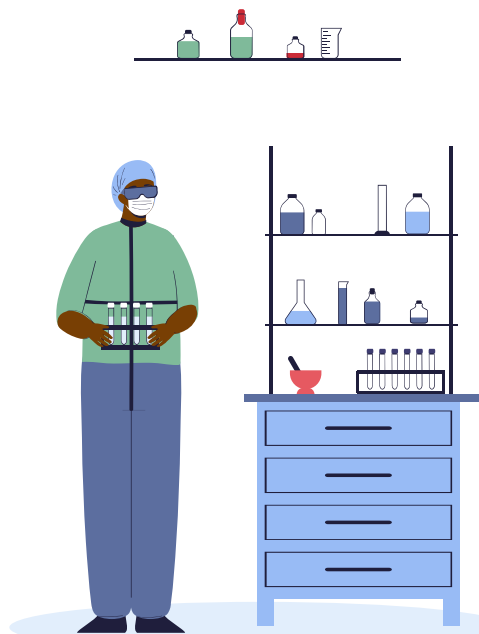


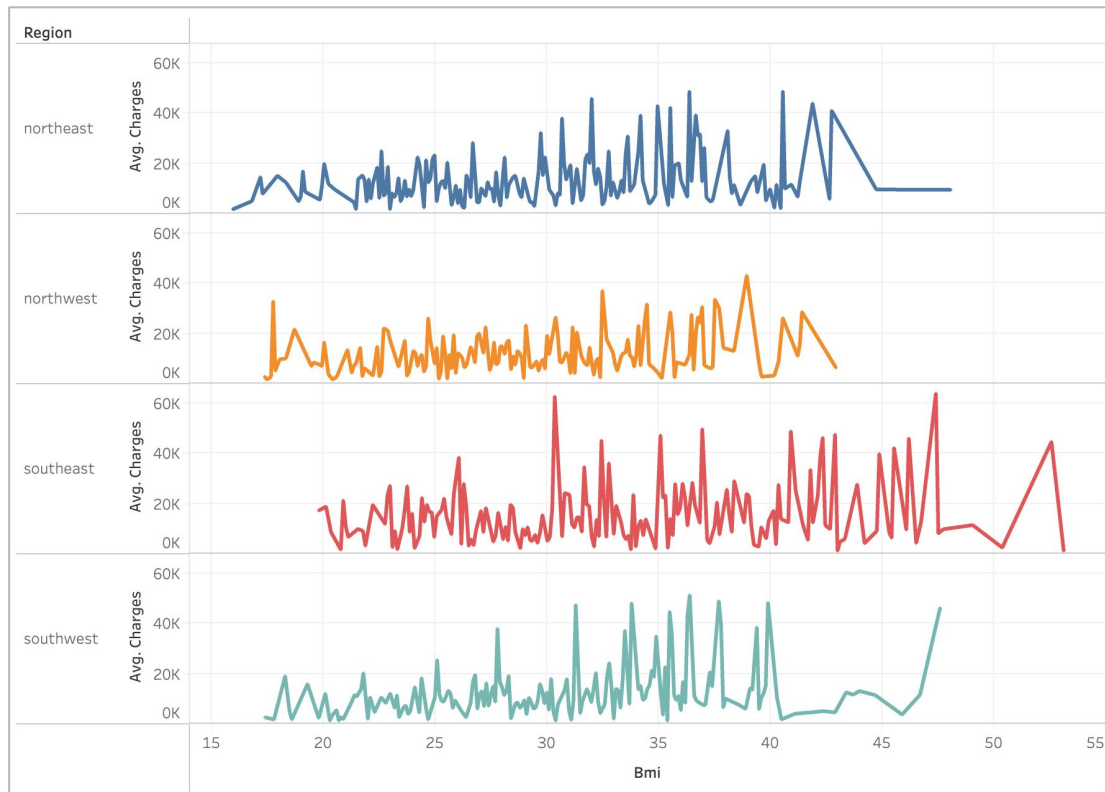


03

Region & BMI

How do average insurance costs vary across a range of BMIs in different geographical regions?





Region & BMI

33.48

Southeast

29.16

Northeast

29.15

Northwest

30.59

Southwest



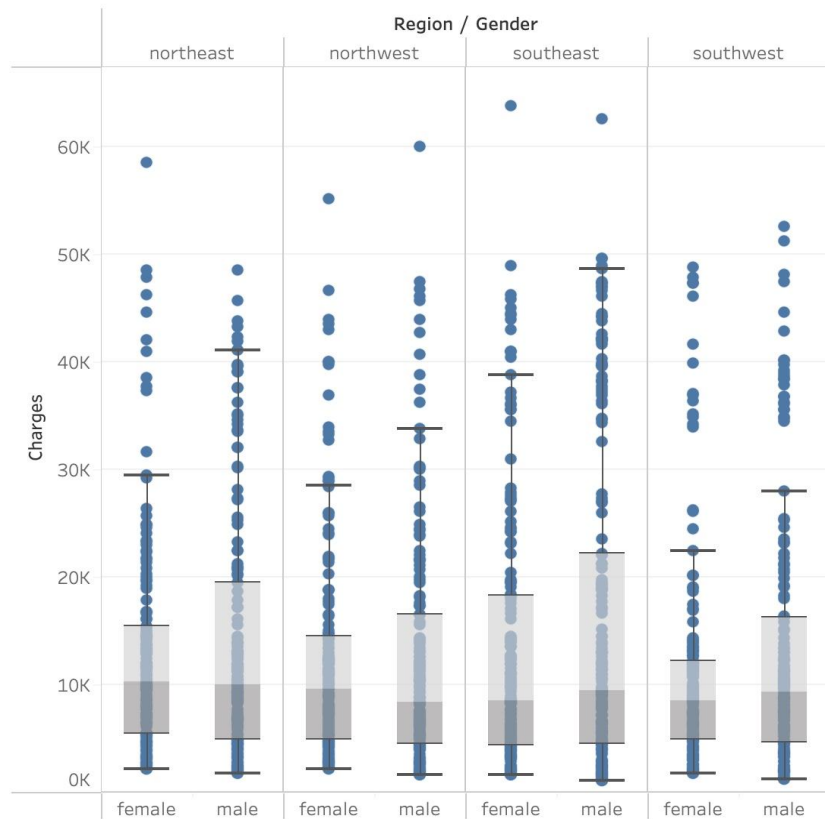
04

Region & Gender

How do average insurance costs vary between genders in different geographical regions?



Charges by Region and Gender



Region & Gender



Men have wider ranges of charges than women in all regions.

The north regions have higher median charges for women, but south regions have higher median charges for men.

\$63,770

the highest charge, for a woman in the southeast

The southeast region also has the widest ranges for charges for both men and women.



05

Number of Children & Gender

How do average insurance costs vary based on the number of children one has and gender?

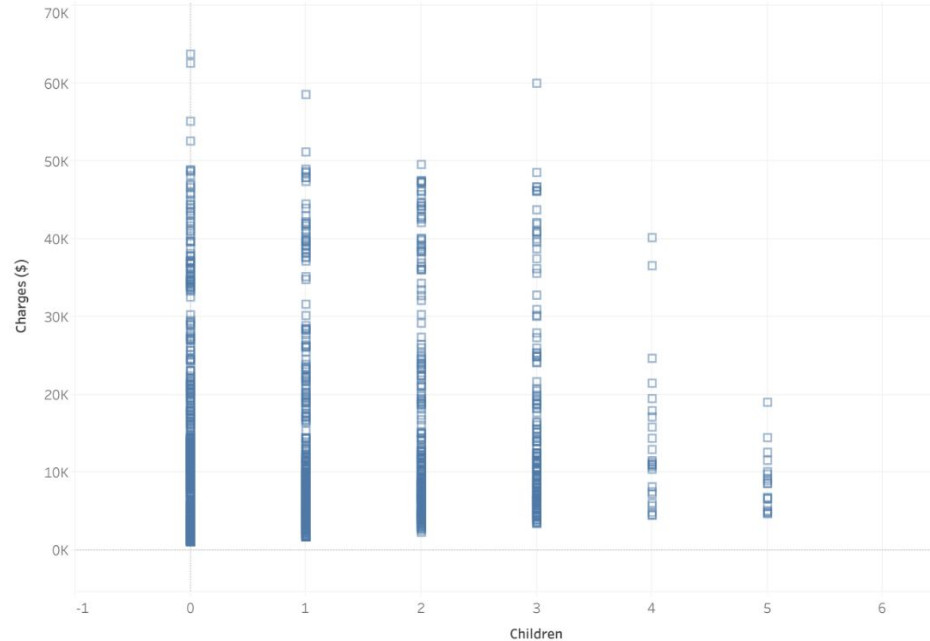


Number of Children

The cost of insurance remains relatively the same for those with 0–3 children.

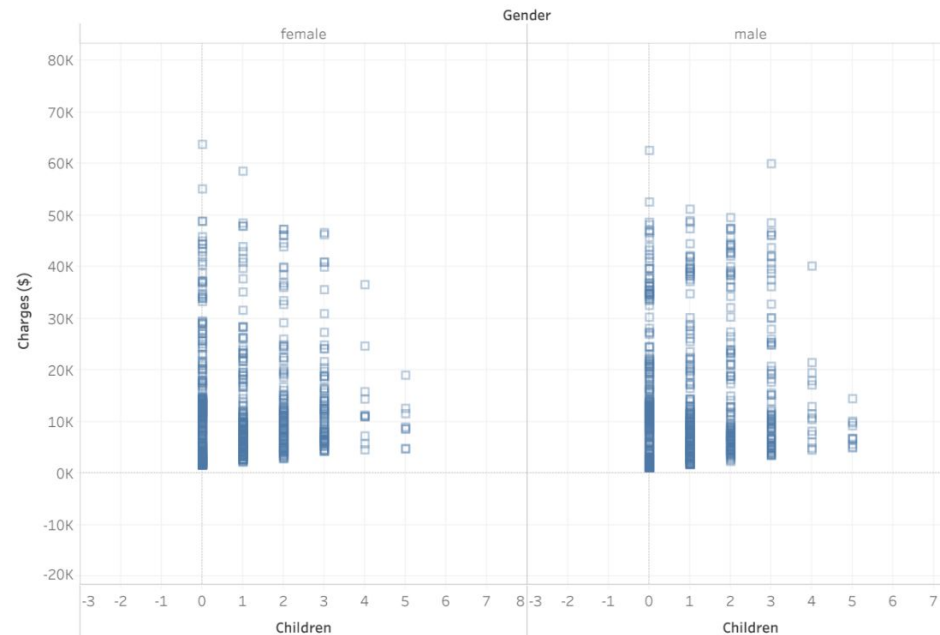
However, insurance charges drop significantly as the number of children increase for those with more than 3 children.

Health Insurance Charges vs. Number of Children Insurance Payer Has





Health Insurance Charges vs. Number of Children Insurance Payer Has (Gender of Insurance Payer)



Gender as an attribute and Children vs. Charges.

Number of Children & Gender

The gender of the insurance payer does not affect the insurance charges.

Both male and females have the same insurance charges with respect to the number of children they have.



06

Smoking & Age

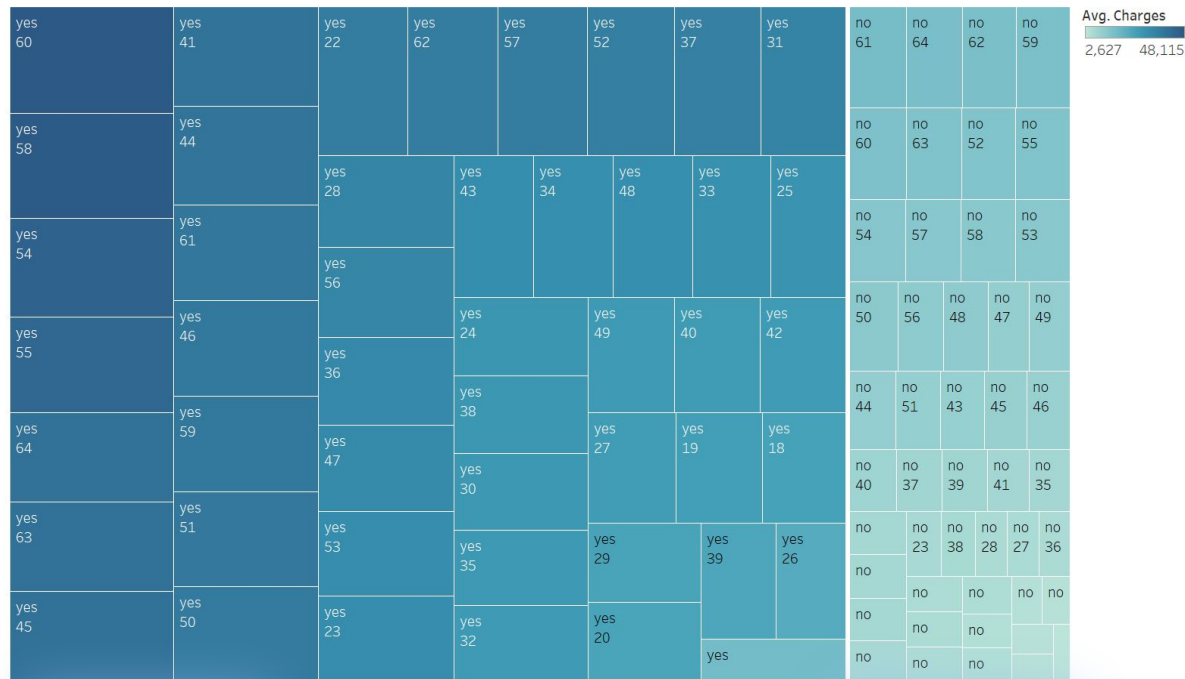
How do average insurance costs vary across different ages for smokers and non-smokers?



Smoking and Age

Lighter Color = Lower Charges

Smoker Vs Average Charges



High

Low

On this heat map, the responses with the lightest shades belong to non-smokers.

Each shade range includes various ages, indicating that age does not have a significant effect on insurance costs of smokers and non-smokers.

yes 60	yes 41
yes 58	<div> Age: 60 Smoker: yes Avg. Charges: 48,115 </div>

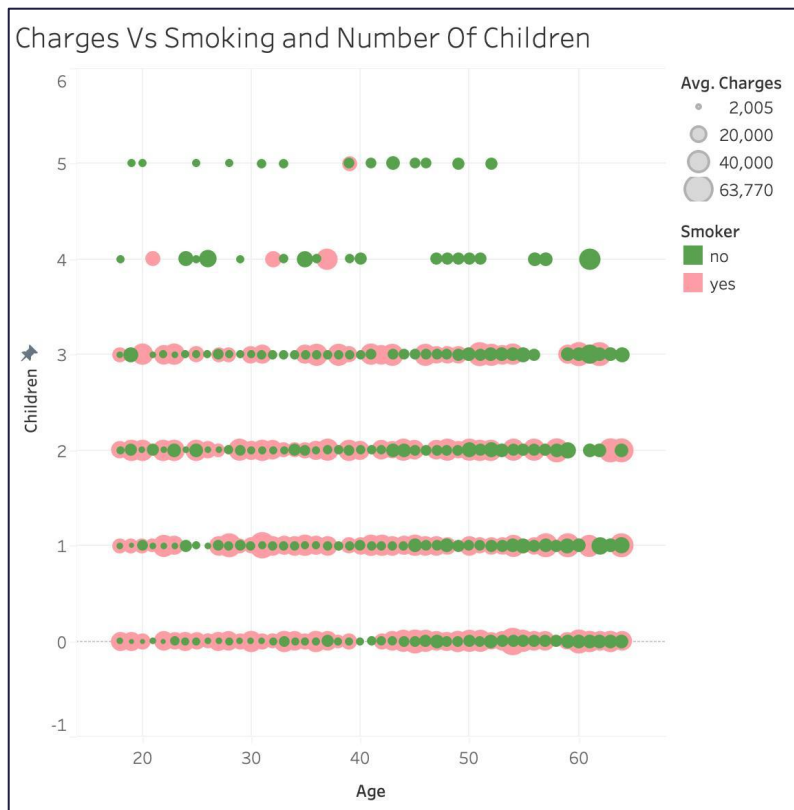
Same Age, Significantly Different Charges...

A 60 year old **smoker** has average charges of **\$48,115** while a 60 year old **non-smoker** has average charges of **\$14,719**.

no 60	no 63	no 52	no 55
no 54	<div> Age: 60 Smoker: no Avg. Charges: 14,719 </div>		

Overall, we can conclude that **smoking** is the most influential factor over a person's average charges.

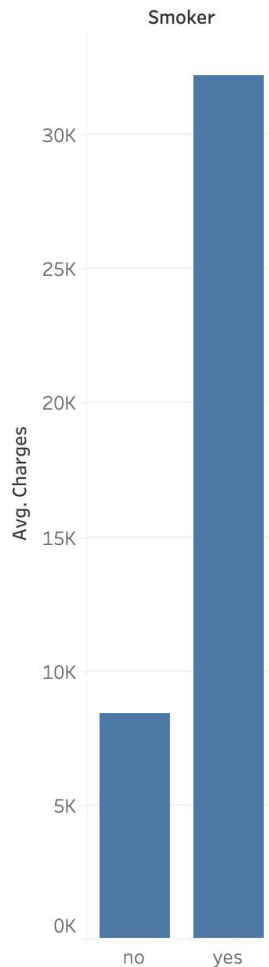
Smoking vs Age based on Number of Children



A 64 year old with 2 children that smokes has insurance charges **triple** than a 64 year old with 2 children that doesn't smoke.

\$8,418

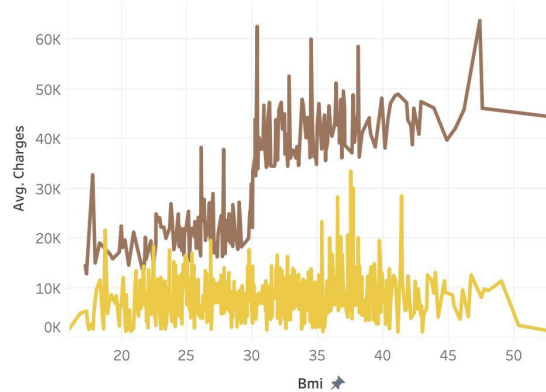
Average insurance costs for
non-smokers



\$32,223

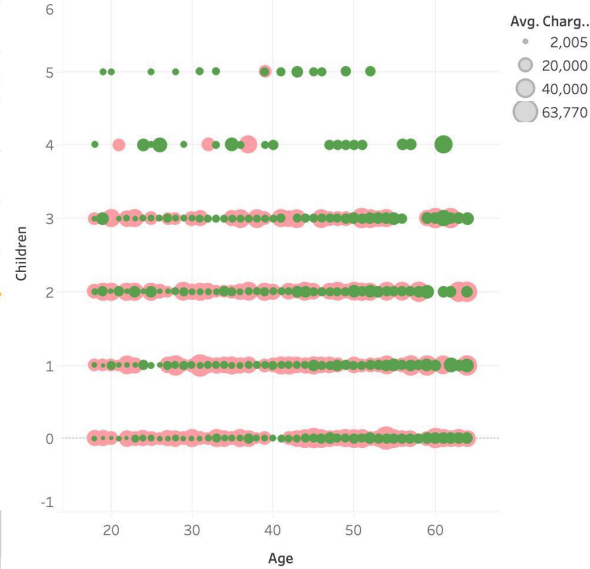
Average insurance costs for smokers

BMI vs Insurance Charges



Smoker
no
yes

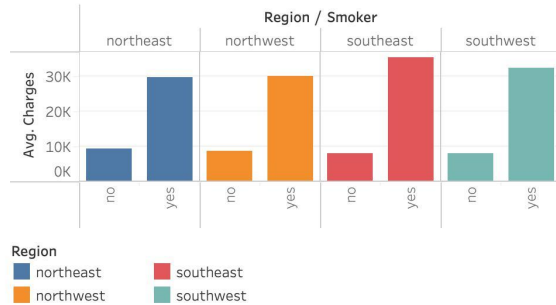
Charges Vs Smoking and Number Of Children



Smoker
no
yes

Avg. Charg..
2,005
20,000
40,000
63,770

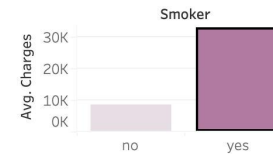
Average Charges vs Region & Smoker



Region
northeast
northwest
southeast
southwest

Smoking is the most critical factor for insurance rates

Avg Insurance Charge vs Smoking



Thanks!

Special thanks to our project lead
Rohan Saklani!

