Estimation and Prediction of Hospitalization and Medical Care Costs

INTRODUCTION

Overview:

      Medical costs are one of the most common recurring expenses in a person's life. Based on different research studies, BMI, ageing, smoking, and other factors are all related to greater personal medical care costs.

      The estimates of the expenditures of health care related to obesity are needed to help create cost-effective obesity prevention strategies. Obesity prevention at Young age is a top concern in global health, clinical practice, and public health.

PurPose:

      Medical care has several important functions other than restoring or maintaining health. These other functions are **assessment and certification of health status, prognostication, segregation of the ill to limit communication of illness, and helping to cope with the problems of illness**--the caring function.

LITERATURE SURVEY

Existing Problems in Medical Care :

- Preventable Medical Errors.
- Lack of Transparency.
- Difficulty Finding a Good Doctor.
- High Costs of Care.
- A Lack of Insurance Coverage.
- The Nursing and Physician Shortage.
- A different perspective on solving the shortage crisis.

**Proposed Solution for Medical care cost :**

     The following are some solutions in Medical Care Costs

1. Save Money on Medicines. ...
2. Use Your Benefits. ...
3. Plan Ahead for Urgent and Emergency Care. ...
4. Ask About Outpatient Facilities. ...
5. Choose In-Network Health Care Providers. ...
6. Take Care of Your Health. ...
7. Choose a Health Plan That is Right for You.

THEORITICAL ANALYSIS

    Cost-benefit analysis is **the examination of a decision in terms of its consequences or costs and benefits**. The shadow price of a good measures the net impact on social welfare of a unit increase in the supply of that good by the public sector. Several patients are having lack of awareness in finding medical solutions for their health problems. Patients are facing the problem of choosing a best doctor, best hospital, best medical care etc., These problems can be solved by analyzing the medical care costs.

Block Diagram
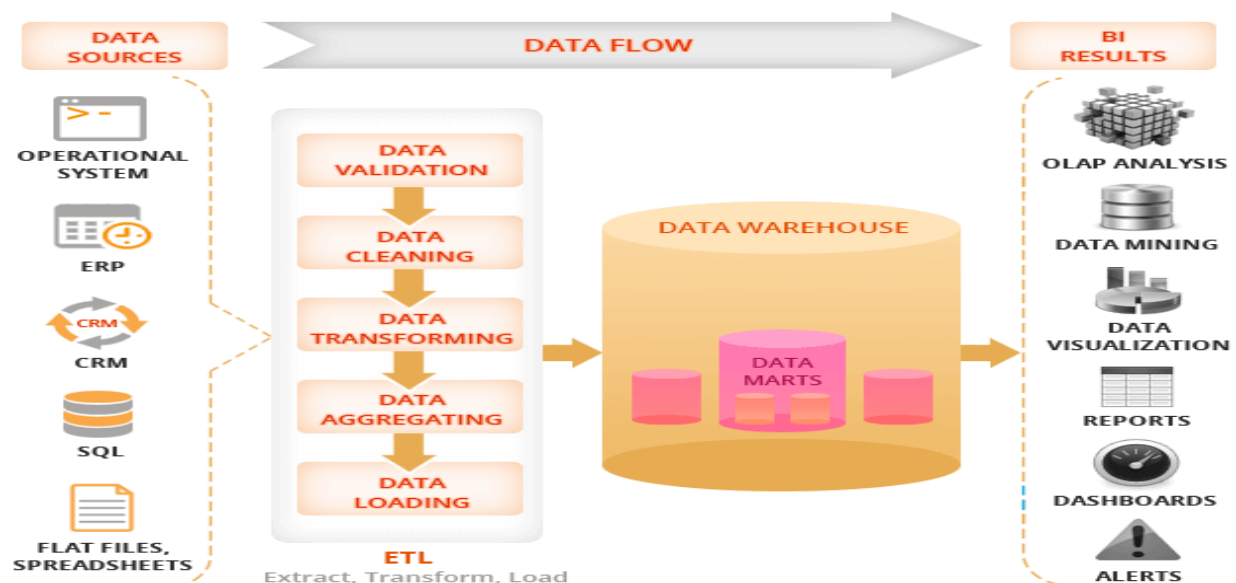
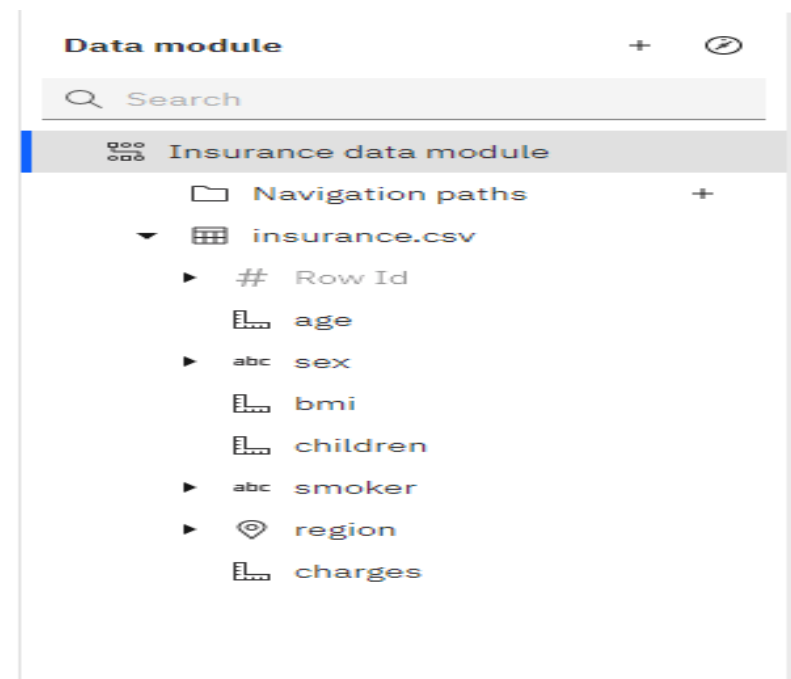# HardWare/SoftWare designing:

Hardware Requirements :

- 11th Generation Intel® Core™ i5 processor
- 35.6 cm (14) diagonal Brightview 1920X1080 & ® Xᵉ Graphics
- 512 GB SSD Hard drive
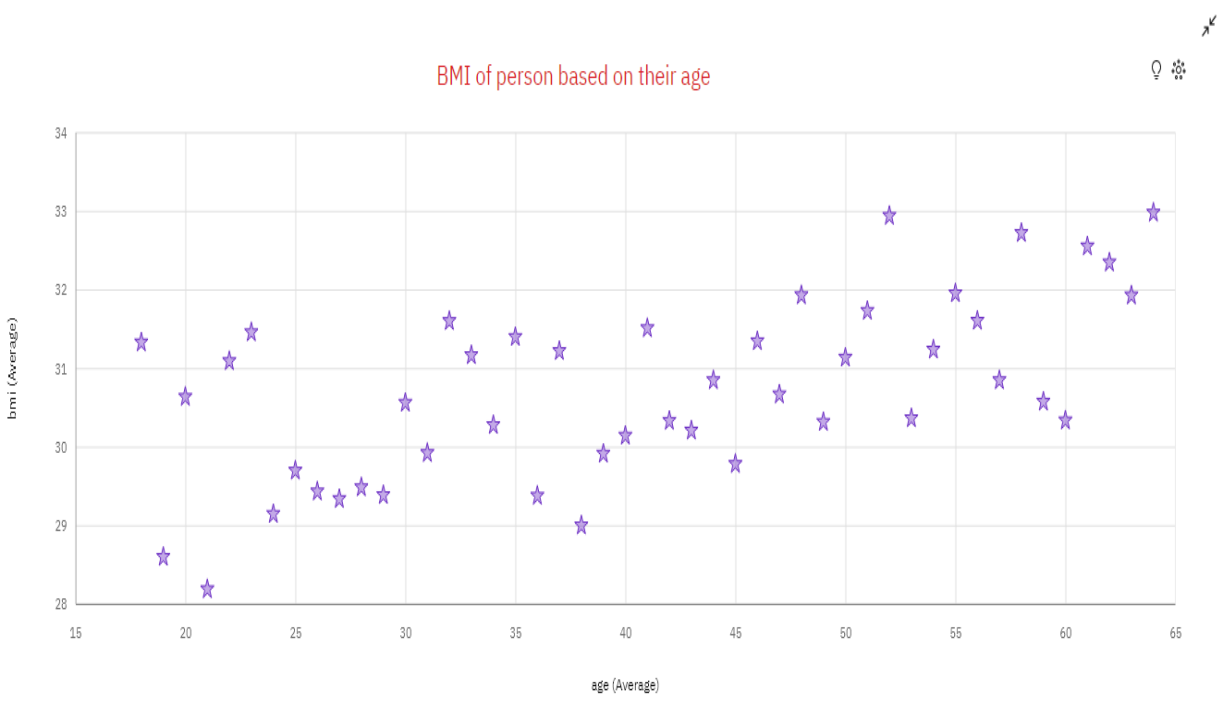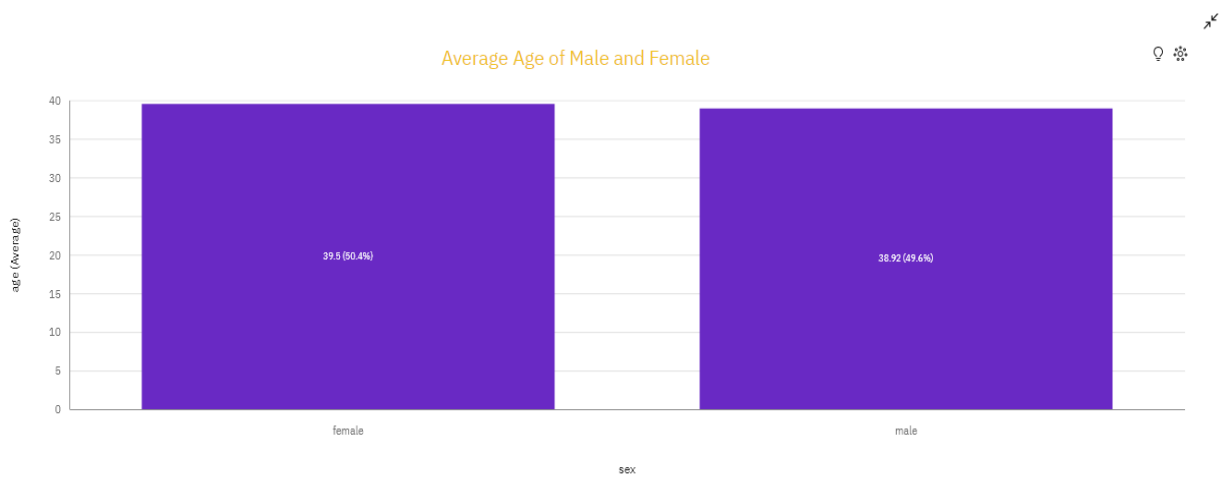- 8 GB DDR4-3200 MHz RAM

Software Requirements :

- Anaconda Navigator
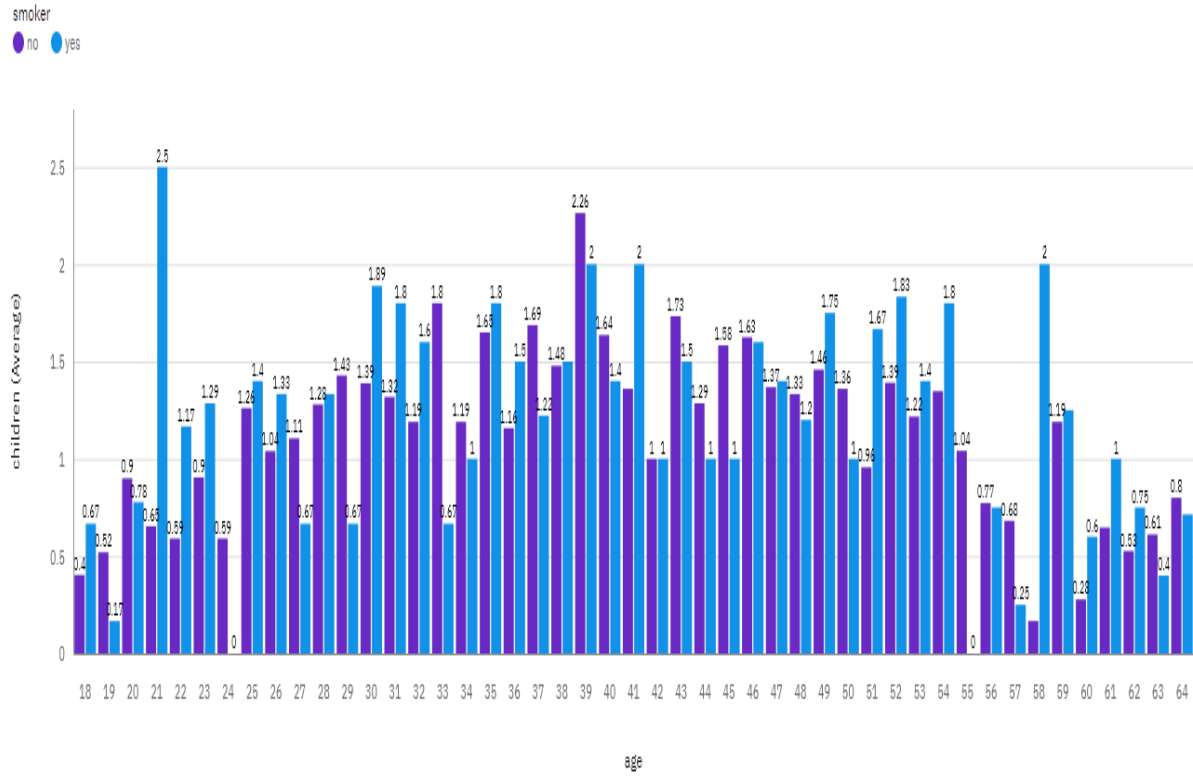- Python, Spider
- IBM Cognos
- MS Word

RESULT

Datamodel

Dashboard

Average Age of Male and Female

39.5 (50.4%) — female
38.92 (49.6%) — male

age (Average) vs sex

BMI of person based on their age

bmi (Average) vs age (Average)

Average number of Children by age and Smoker or not

smoker
● no ● yes

Average age of people according to their region and gender

age (Average)
38.78   39.7

charges paid by people according to their age and Smoker

smoker
+ no + yes

charges (Average)

40,000

30,000

20,000

10,000

0

27,030.15
28,126.72
29,370.77
29,915.19
30,132.32
33,737.07
32,984.95
37,147.59
38,014.57
40,630.7

3,364.78
5,368.1
5,566.96
6,365.35
7,630.77
8,446.84
10,675.69
12,399.95
13,165.66
15,232.71

less than 23 23 to < 28 28 to < 32 32 to < 37 37 to < 41 41 to < 46 46 to < 51 51 to < 55 55 to < 60 60 and above

age (Group)

BMI of a person by their gender and Smoker

bmi (Average)

29.61   51.6

smoker

no

yes

female   male

sex

Charges paid by people according to their gender,region and smoker

charges (Average)
36,029.84

7,609

region - smoker
- northeast | no
- northeast | yes
- northwest | no
- northwest | yes
- southeast | no
- southeast | yes
- southwest | no
- southwest | yes

female | 29,670.82
female | 31,687.99
fe...
fe...
female | 28,032.05
male | 36,029.84
female | 33,034.82
m...
m...
male | 30,926.25
male | 32,598.86
male | 30,713.18
fe...
m...
fe...
m...

Average BMI of people by gender and region

region
- northeast
- northwest
- southeast
- southwest

bmi (Average)

female	male
30.06 (49.1%)	31.13 (50.9%)
32.67 (49%)	33.99 (51%)
29.28 (50.1%)	29.12 (49.9%)
29.32 (50.3%)	29.02 (49.7%)

sex
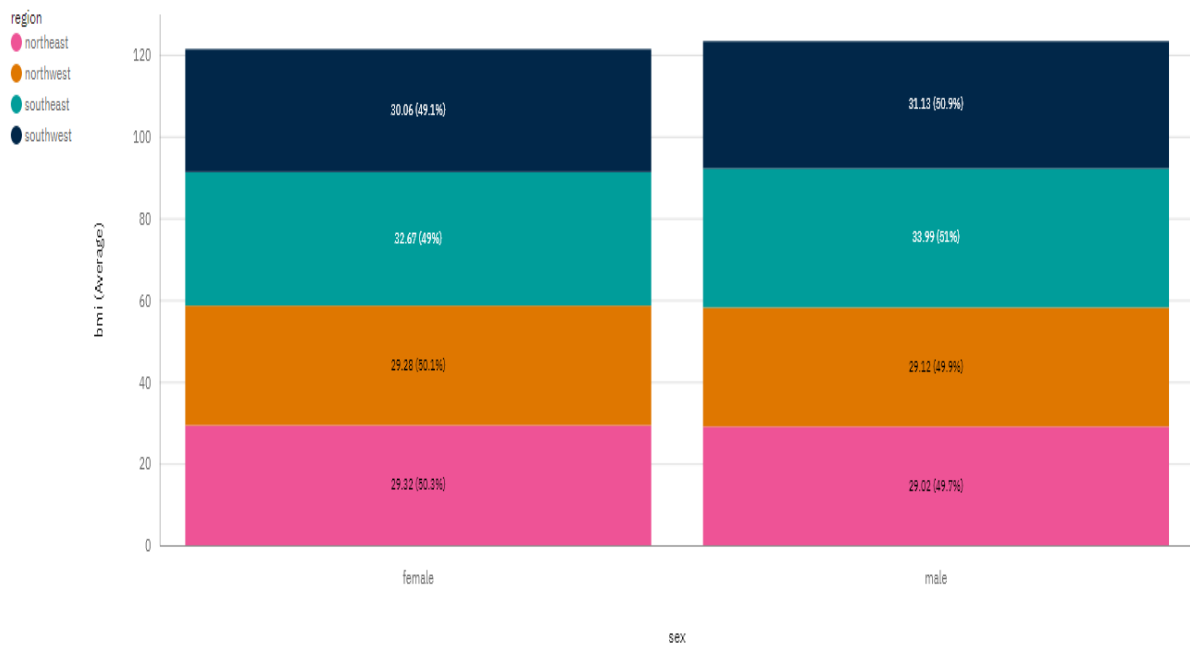
Top 100 charges paid by people based on BMI and colored by region
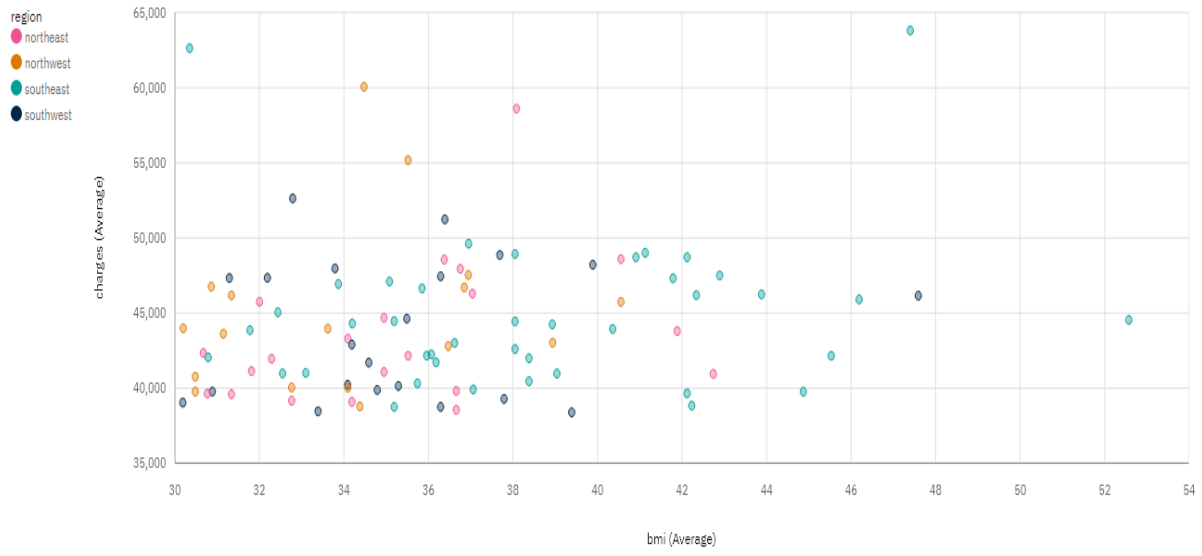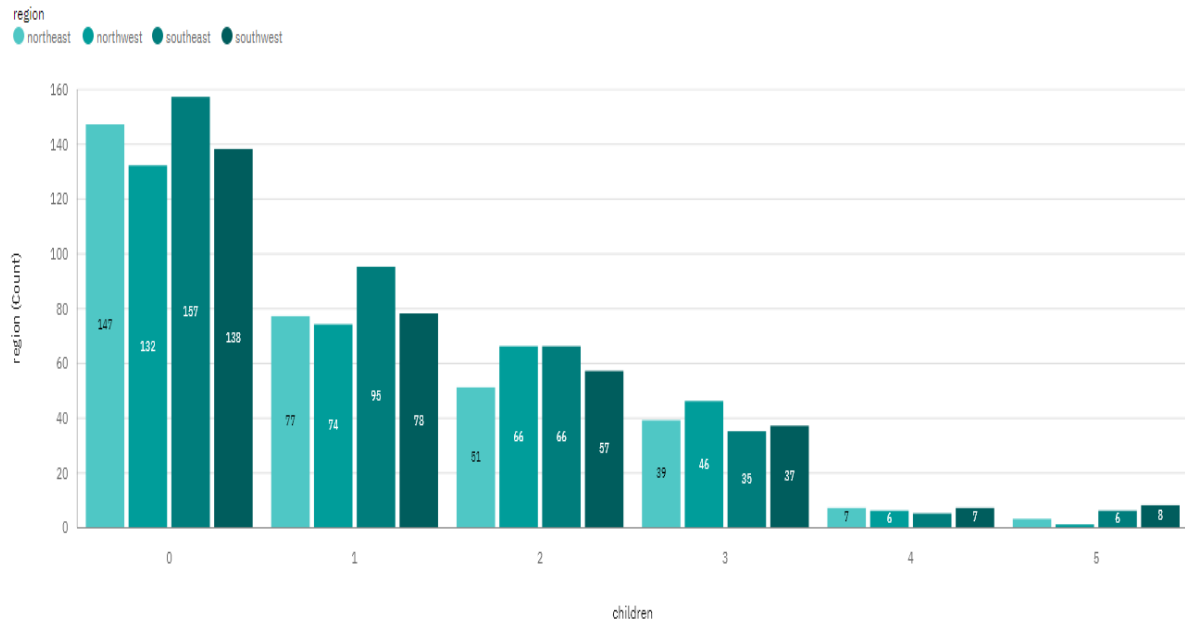
Number of children to the people by region

Charges paid by the people by region
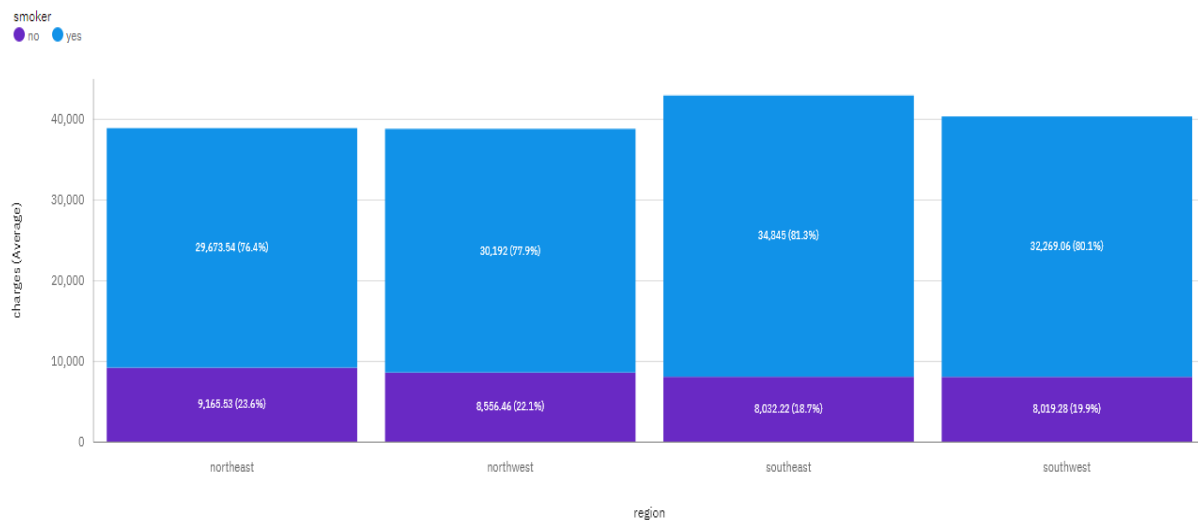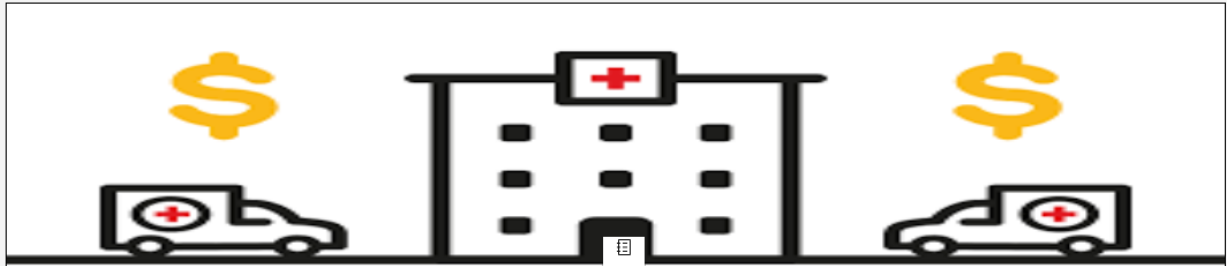
smoker
● no ● yes

Region	no	yes
northeast	9,165.53 (23.6%)	29,673.54 (76.4%)
northwest	8,556.46 (22.1%)	30,192 (77.9%)
southeast	8,032.22 (18.7%)	34,845 (81.3%)
southwest	8,019.28 (19.9%)	32,269.06 (80.1%)

Charges based on number of children

bmi (Sum)
532.89 — 17,535.87

children	charges (Average)
0	12,365.98
1	12,731.17
2	15,073.56
3	15,355.32
4	13,850.66
5	8,786.04
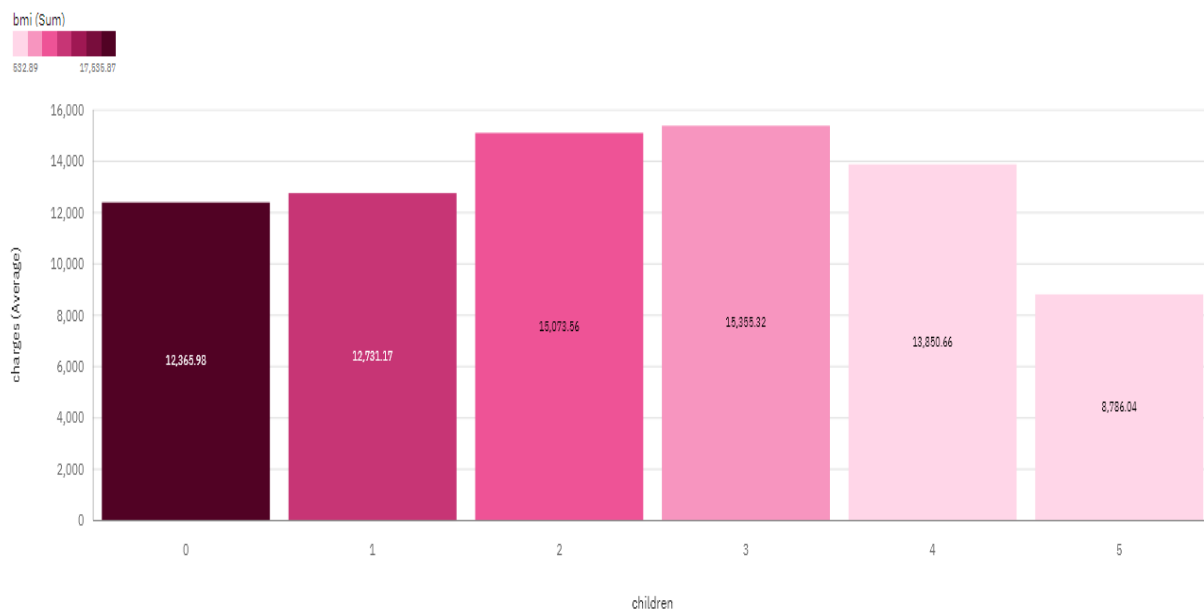
Story

Medical Care Costs Story
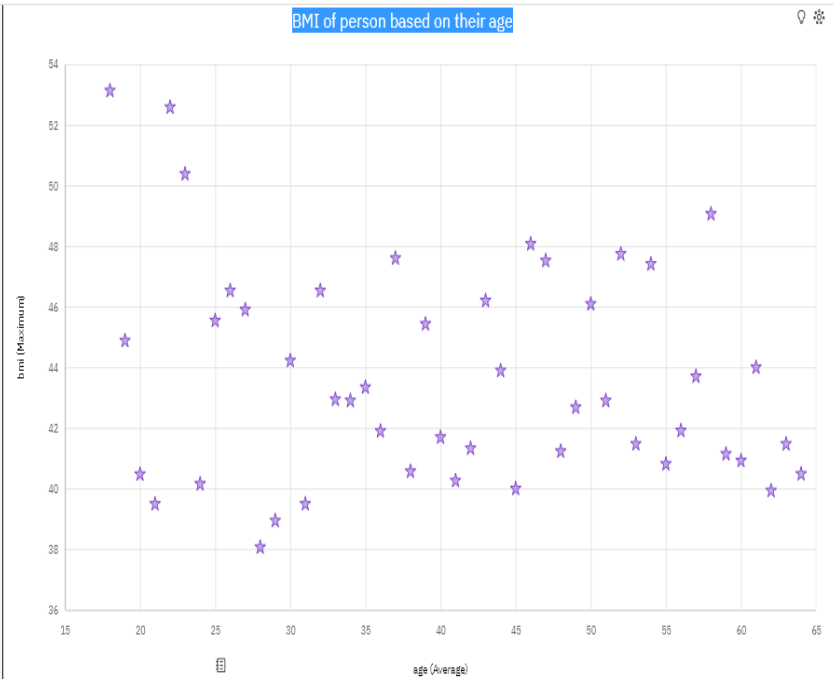

Medical Care Costs Story

This graph mainly represents the average age of males and females and as we the female average is higher

the average age of females is higher despite having a little bit less number of females in the overall dataset

Average Age of Male and Female

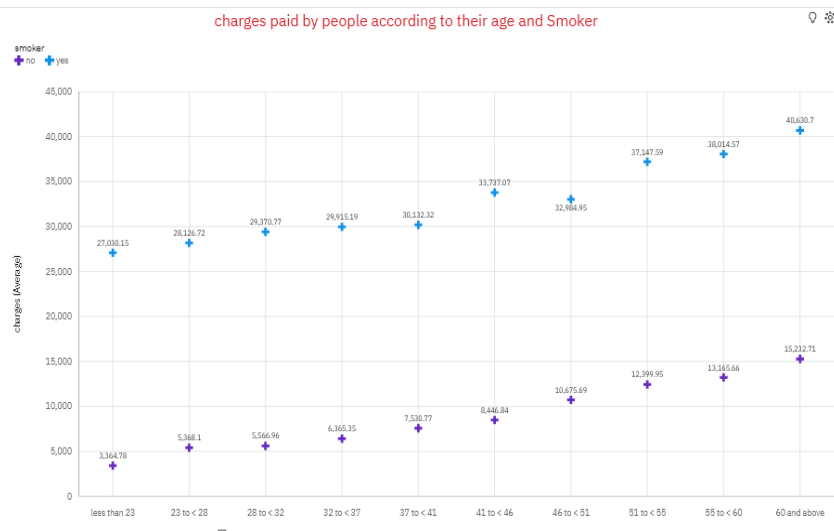39.5 (50.4%)

38.92 (49.6%)

female

male

Medical Care Costs Story

- As age is increasing the average BMI of persons also increases. this means BMI and age are lineraly proportional.
- The maximum value of BMI by is like in middle Age group it's little bit higher but is age increases the BMI value is getting descreased
-

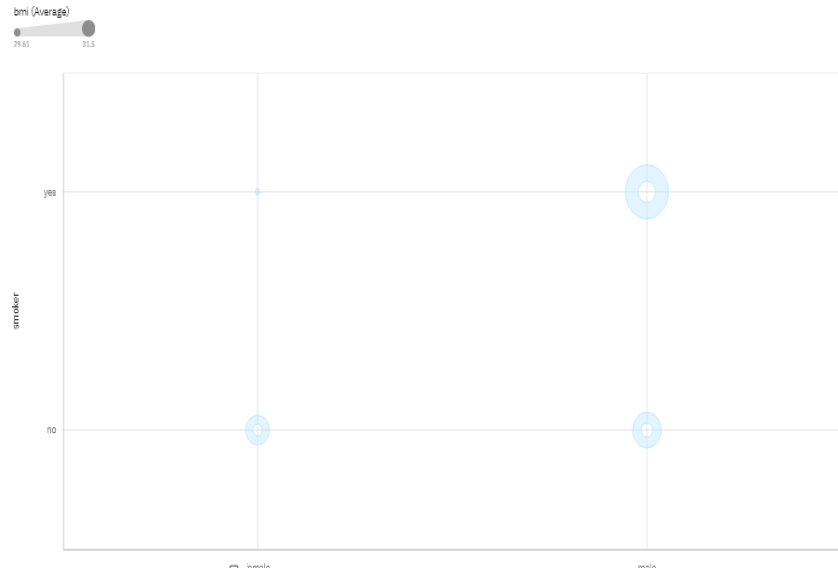**BMI of person based on their age**

Medical Care Costs Story

- Smokers of any age are playing more than non-smoker,the value is also almost 3 to 5x higher
- Chargers are getting increased as the age is also increasing in both scenarios

charges paid by people according to their age and Smoker

Medical Care Costs Story

- Males and smokers have the highest average BMI value Compared to all.
- Females and smokers have the less average BMI values compared to all.
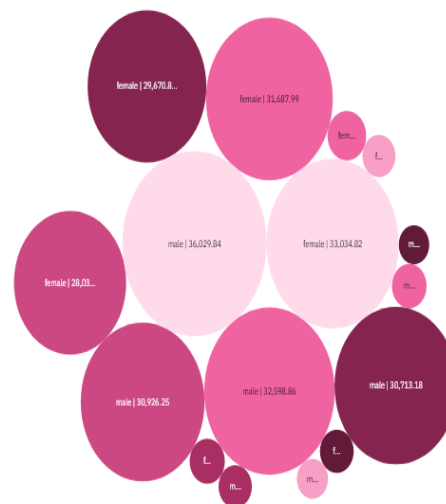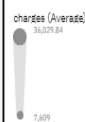- Incase non smokers irrespective of gender their average BMI is almost similar

BMI of a person by their gender and Smoker

bmi (Average)

29.61   31.5

smoker

yes

no

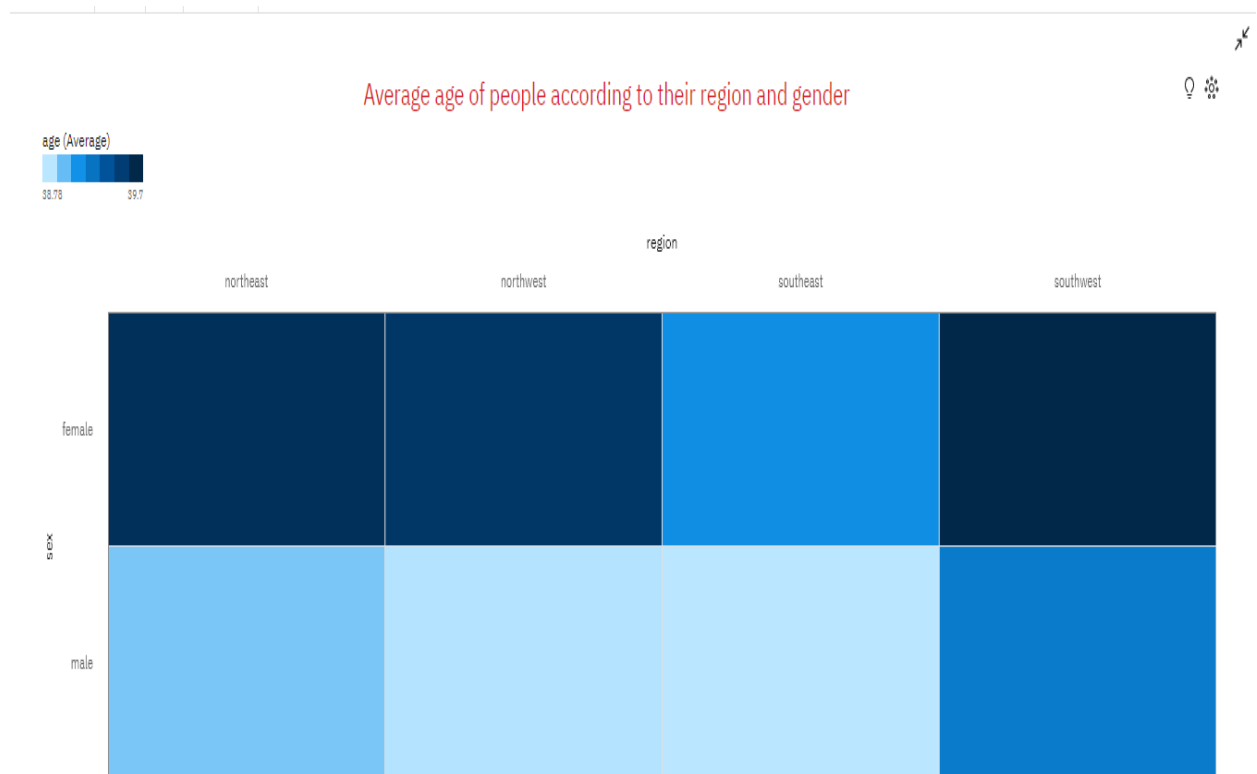female   male

Medical Care Costs Story

- Southeast region people, both men and women are paying more charges compared to other regions
- south-east region smokers a the ones who a playing more charges.
- out of all as we have seen smokers tend to pay more irrespective of region

Charges paid by people according to their gender,region and smoker

charges (Average)
36,029.84

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region - smoker
- northeast | no
- northeast | yes
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female | 29,670.8...
female | 31,687.99
fem...
f...
male | 36,029.84
female | 33,034.82
m...
female | 28,03...
m...
female | 30,926.25
male | 32,598.86
male | 30,713.18
f...
f...
m...
m...

Smoking Is NOT Only Injuries To Health But Also For Wealth

REPORT

Average age of people according to their region and gender

age (Average)

38.78   39.7

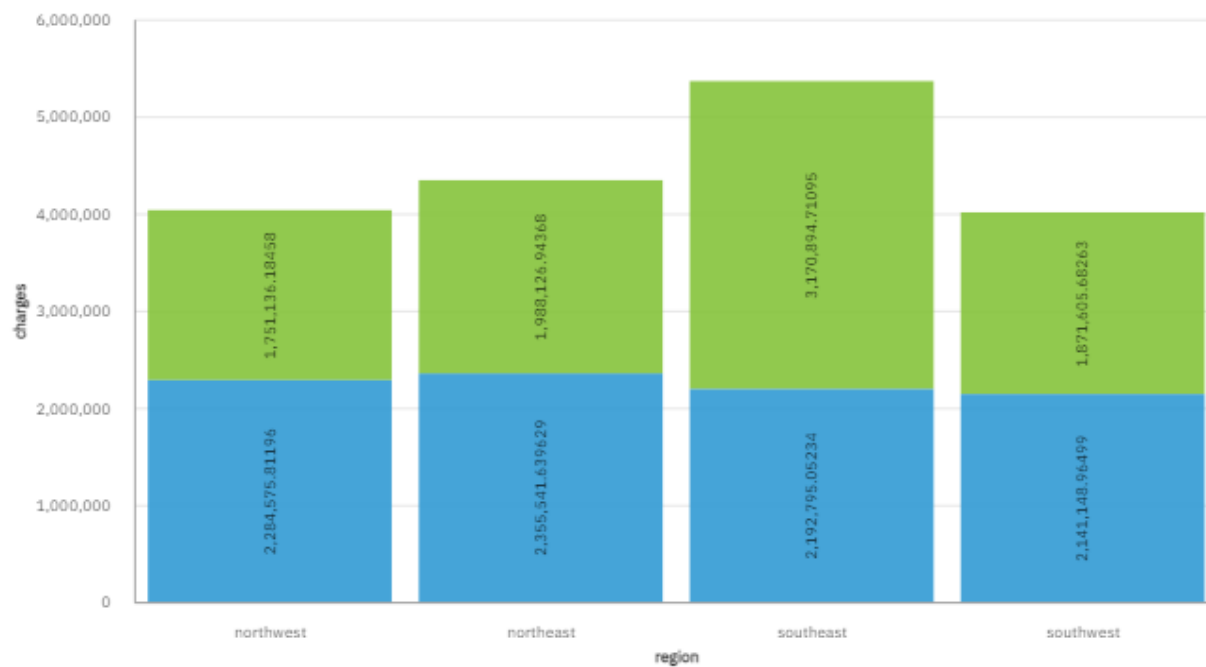## the bmi of south east is higher

region
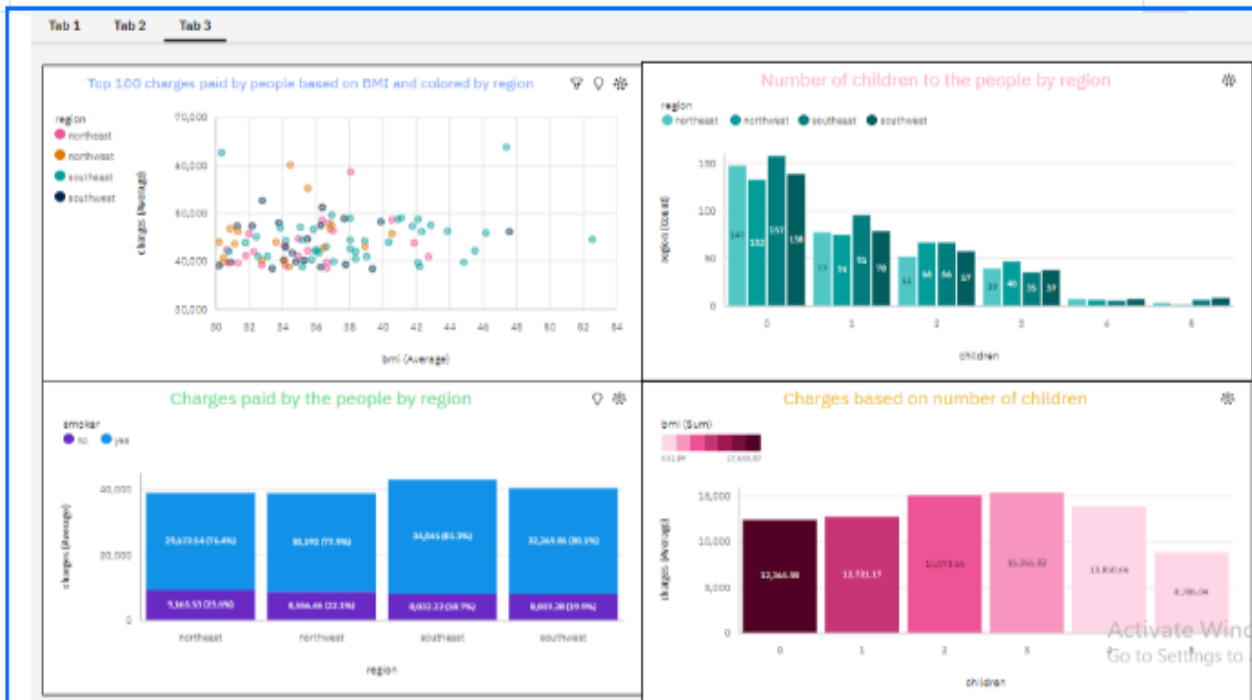● northwest ● northeast ● southeast ● southwest
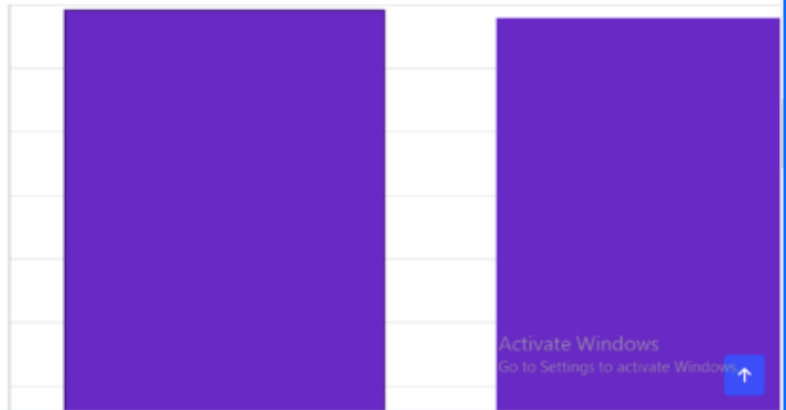

smoker
● no ● yes

Web Integration

Medical Care Cost in India

Home   Dashborad   Story   Report   Contact

Medical Care Cost Analysis in India

Indians are struggling with healthcare costs, so much so that its rise is pushing 5.5 crore Indians below the poverty line1. India's per capita expenditure on health remains among the lowest in the world. India still spends only around 1.5% of its budget on health. Medical Care is Key For Developement Nation

Get Started

HOSPITAL

Dashboard

Tab 1   Tab 2   **Tab 3**

Top 100 charges paid by people based on BMI and colored by region

region
- northeast
- northwest
- southeast
- southwest

Number of children to the people by region

region
- northeast
- northwest
- southeast
- southwest

Charges paid by the people by region

smoker
- no
- yes

Charges based on number of children

bmi (Sum)

Story

Medical Care Costs Story

Medical Care Costs Story

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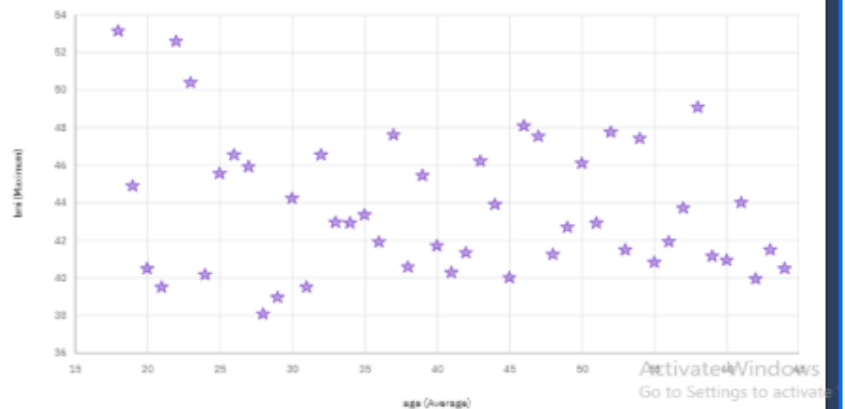

Activate Windows
Go to Settings to activate Windows
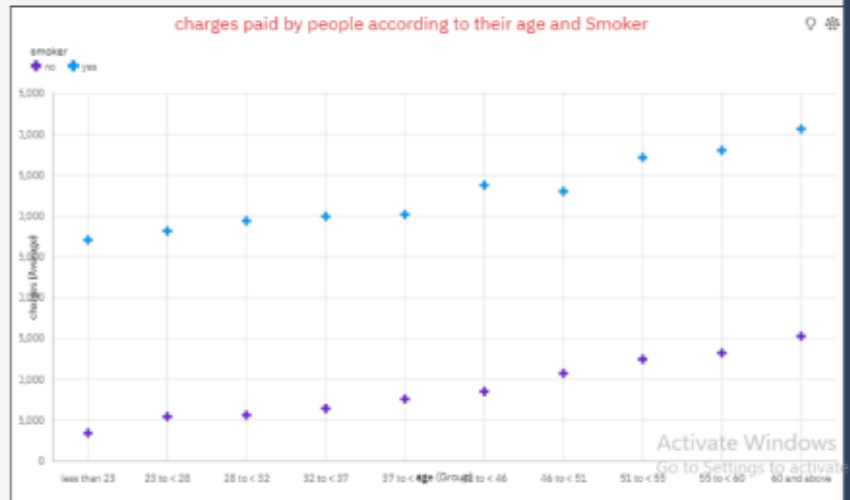
Medical Care Costs Story

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-

BMI of person based on their age
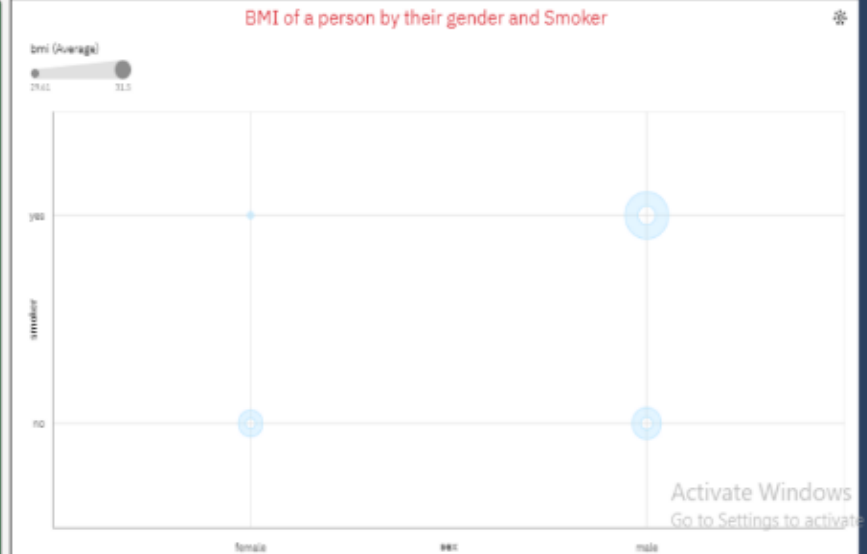

Activate Windows
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Charges paid by people according to their gender,region and smoker

charges (Average)

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Activate Windows
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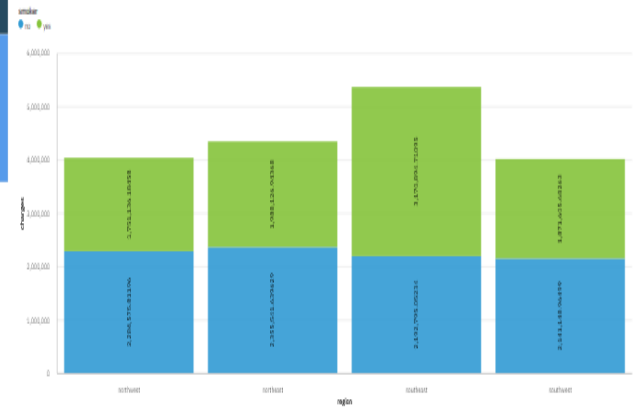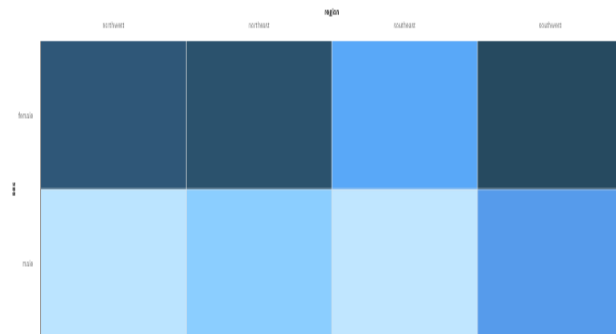# Smoking Is NOT Only Injuries To Health But Also For Wealth

Report

Medical_Care_Cost_Report

Medical_Care_Cost_Report

Average Age of Person based on region and gender

The Number of fmles in northwest is higher than every other

Advantages&Disadvantages

Advantages:

- Lower costs—reduces maintenance due to complete report coverage and a zero-footprint environment.
- Faster results—shortens reporting time due to seamless integration and adaptive authoring.
- Improved decision making—reports and dashboards present data in easily-understood formats
- *ibm* provides powerful data visualization, dashboarding, and reporting capabilities that help users quickly and easily access relevant insights.
- This allows businesses to make data-driven decisions more efficiently and effectively.

Disadvantages

IBM Cognos Cons. **There are some small features that are missing**. It would be nice if the graphics were better. You can use external sources for charts, but it's quite complex to use and not easy to implement.

BM Cognos Analytics **does not support drill-through for reports in Microsoft Excel format**. IBM Cognos Analytics does not support map reports in Microsoft Excel format. IBM Cognos Analytics does not support some formatting. The Microsoft Excel spreadsheet software does not support hyperlink buttons.

- Services are intangible.
- The provider is the product.
- They're perishable.
- Quality can vary from day to day.

Application

- IBM Cognos Business Intelligence is a web-based integrated business intelligence suite by IBM. It **provides a toolset for reporting, analytics, scorecarding, and monitoring of events and metrics**.
- The software consists of several components designed to meet the different information requirements in a company.

- Predictive analytics in healthcare **predicts future patient outcomes and identifies what treatment to give patients based on their health condition**.

- Standard techniques used in predictive analysis include machine learning, statistical modeling, and data mining.

Conclusion

IBM's mission statement is "to lead in the creation, development and manufacture of the industry's most advanced information technologies, including computer systems, software, networking systems, storage devices and microelectronics.

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Futurescope

IBM plays a critical role in the *health* industries — our solutions, *services* and innovations are enabling the *future* for *healthcare* and life sciences

We design secure platform experiences for data and artificial intelligence needs across enterprise. **We also offer you advanced healthcare technology solutions to drive impact, services to digitally transform and the ability to implement at scale with a trusted partner**