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:

The main objective of cost accounting are ascertainment of cost, fixation of Selling price, proper recording and presentation of cost data to management for measuring Efficiency and for cost control and cost reduction, ascertaining the profit of each activity, Assisting management in decision making process.

Literature Survey

Existing Problems in Medical Care:

1. **The High Cost of Health Care.**
2. **The Concerns of Health Equity.**

3. **The Promise (and Pitfalls) of Technology.**
4. **The Move toward Value-Based Care.**
5. **The Growing Provider Shortage.**

Proposed Solution For Medical Care Cost:

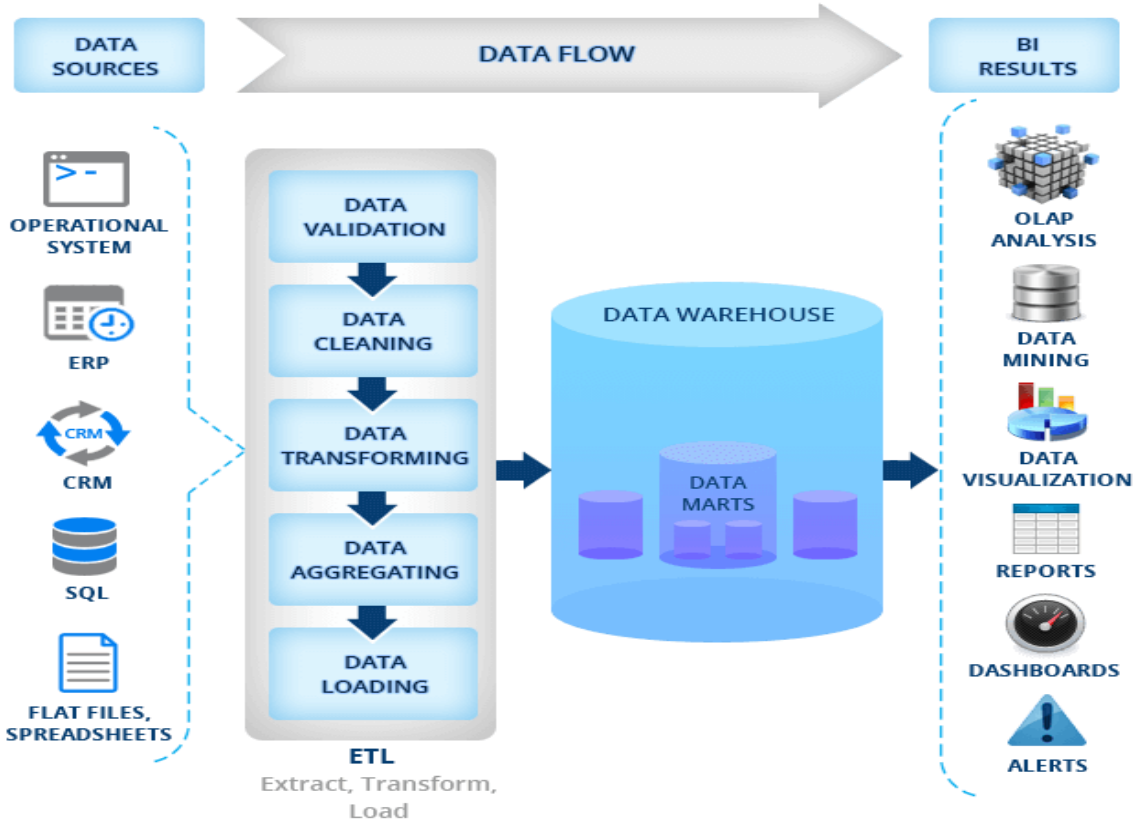
The following are some solutions in medical care costs

1. **Expand Insurance to Cover Health Care Costs.**
2. **Extend TELE health Services.**
3. **Invest in Mobile Clinics.**
4. **Educate The Public About Multiple Health Care Sites.**
5. **Improve Cultural Responsiveness.**

THEORITICAL ANALYSIS:

The self-service capabilities of this platform allow users to build their own dashboards, Reports and scorecards in a simple, intuitive and secure way. It also **provides ease of use for Advanced data analysis**.

Block Diagram



Hardware & Software Designing

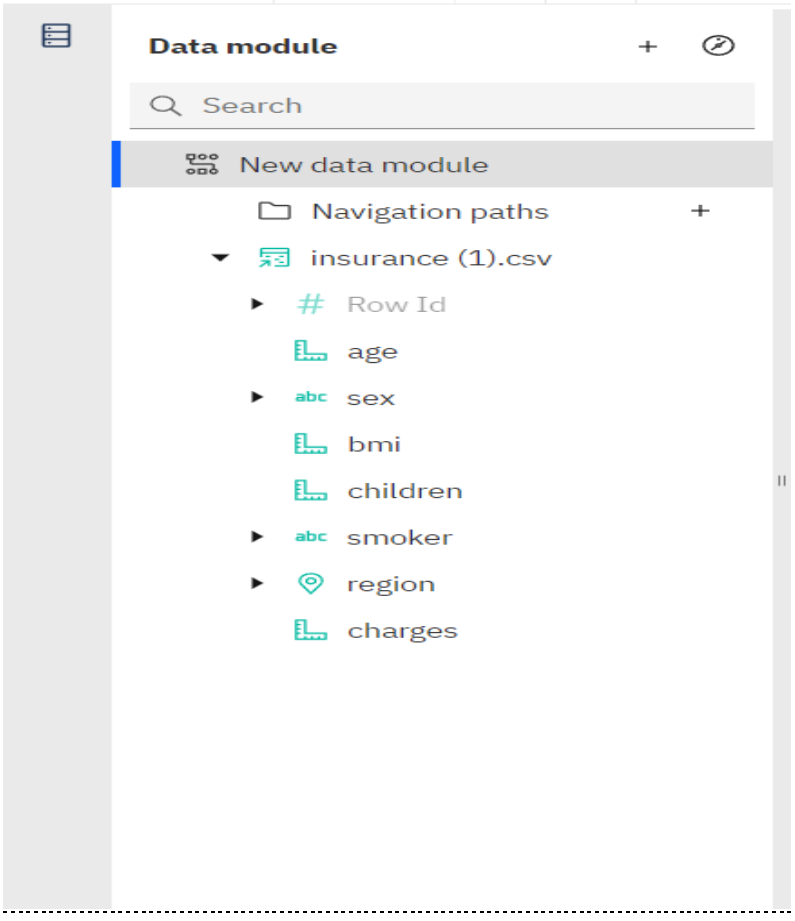
Hardware Requirements:

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

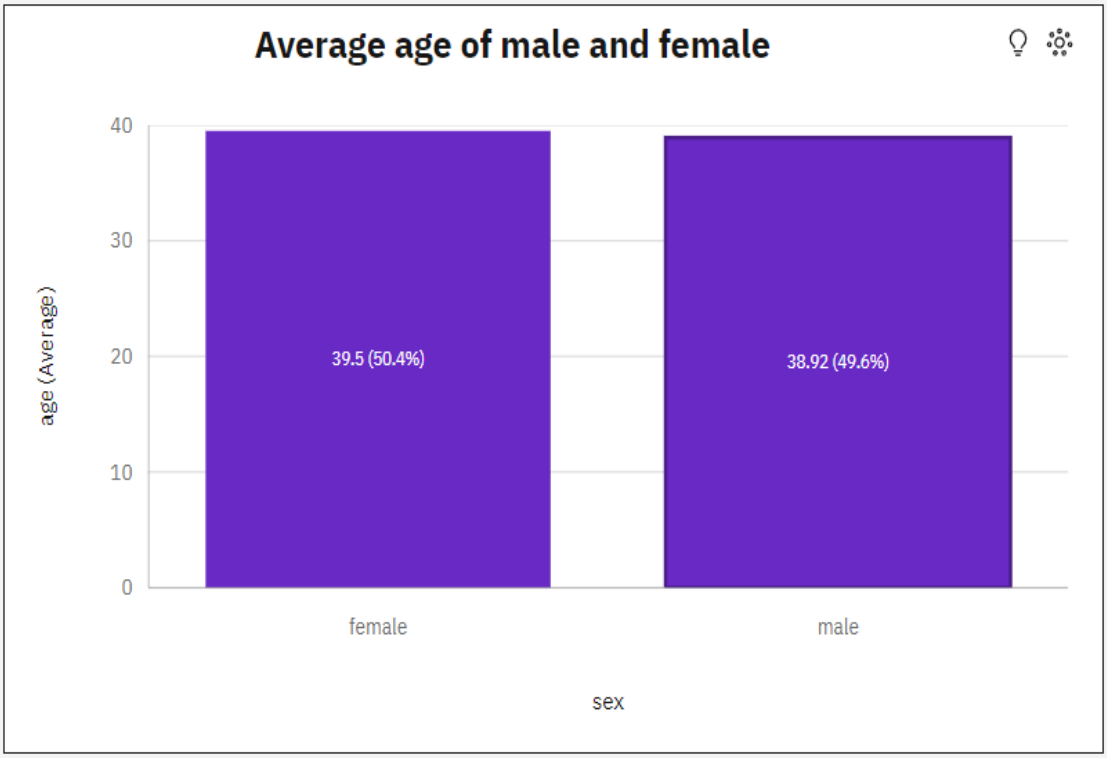
Software Requirements:

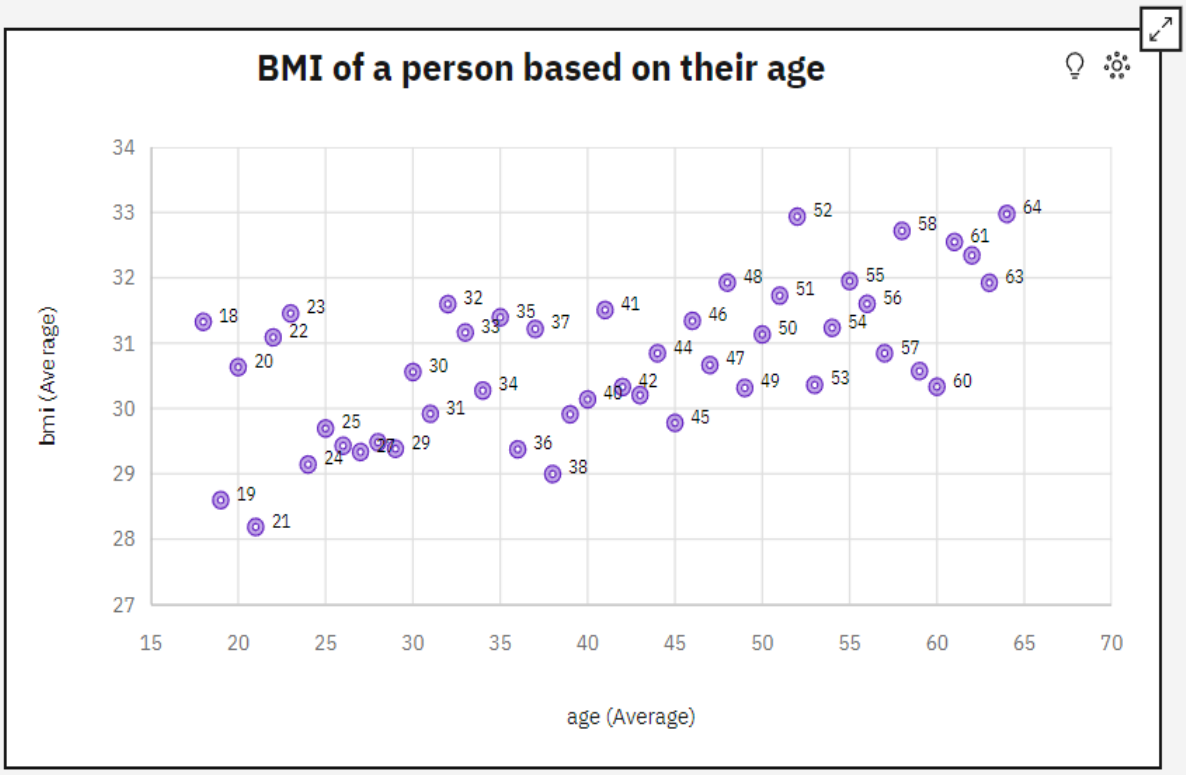
- Anaconda Navigator
- Python, Spider
- IBM COGNOS
- MS Word

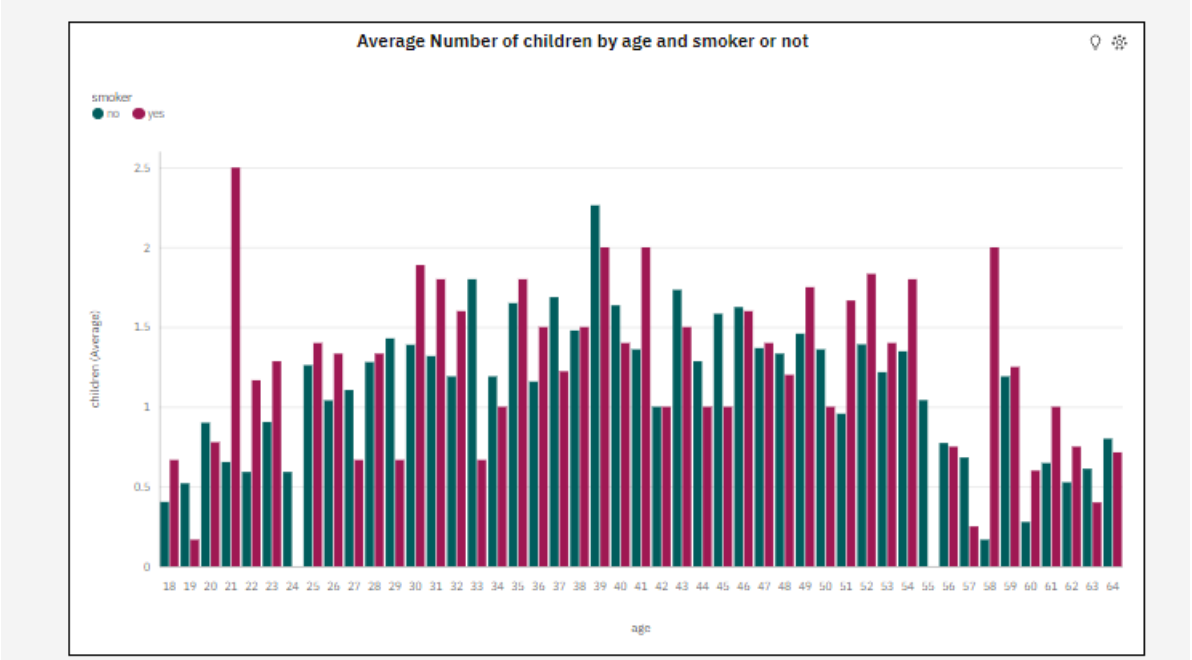
RESULT:

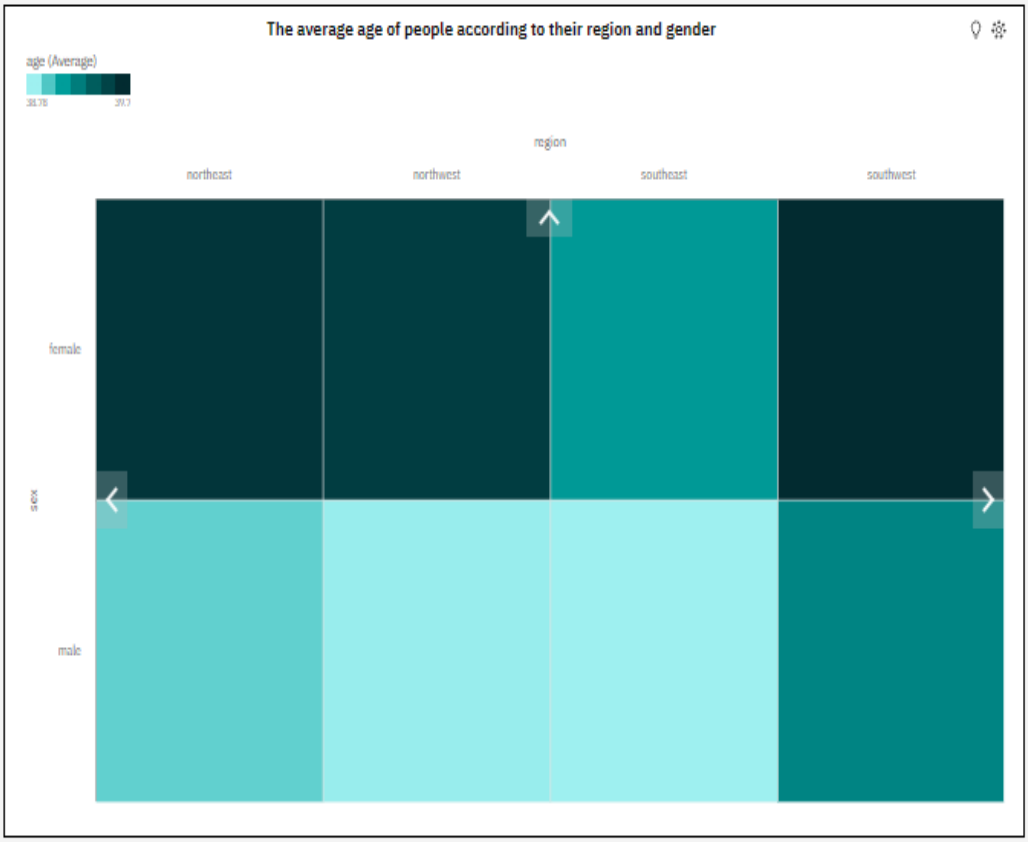


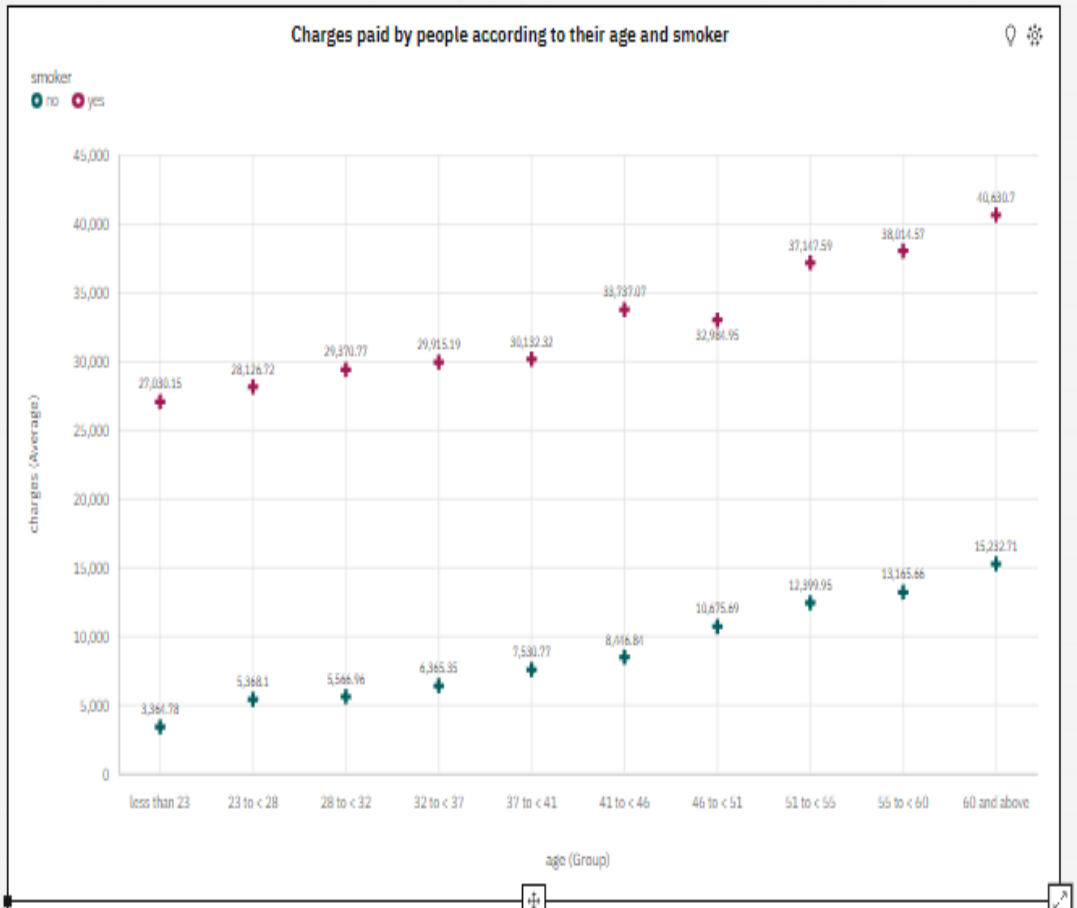
Dashboard

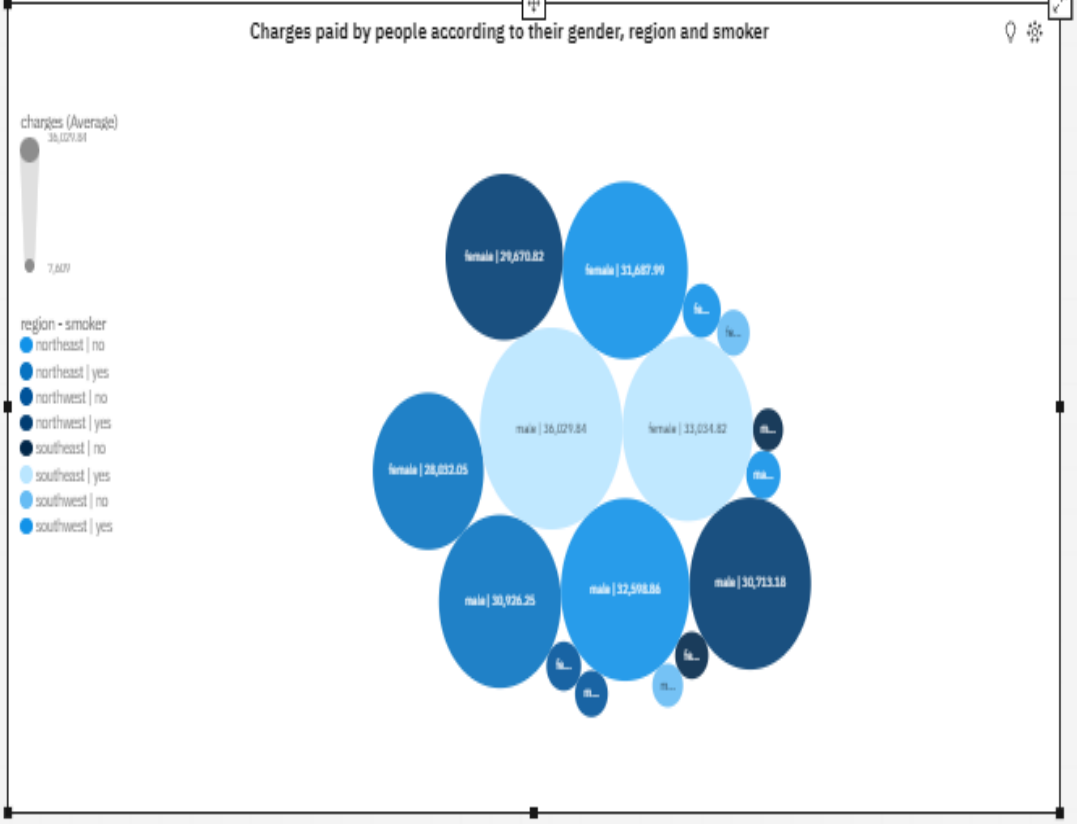

Average age of male and female
40
30
20
10
0
age (Average)
39.5 (50.4%)
38.92 (49.6%)
female
male
sex

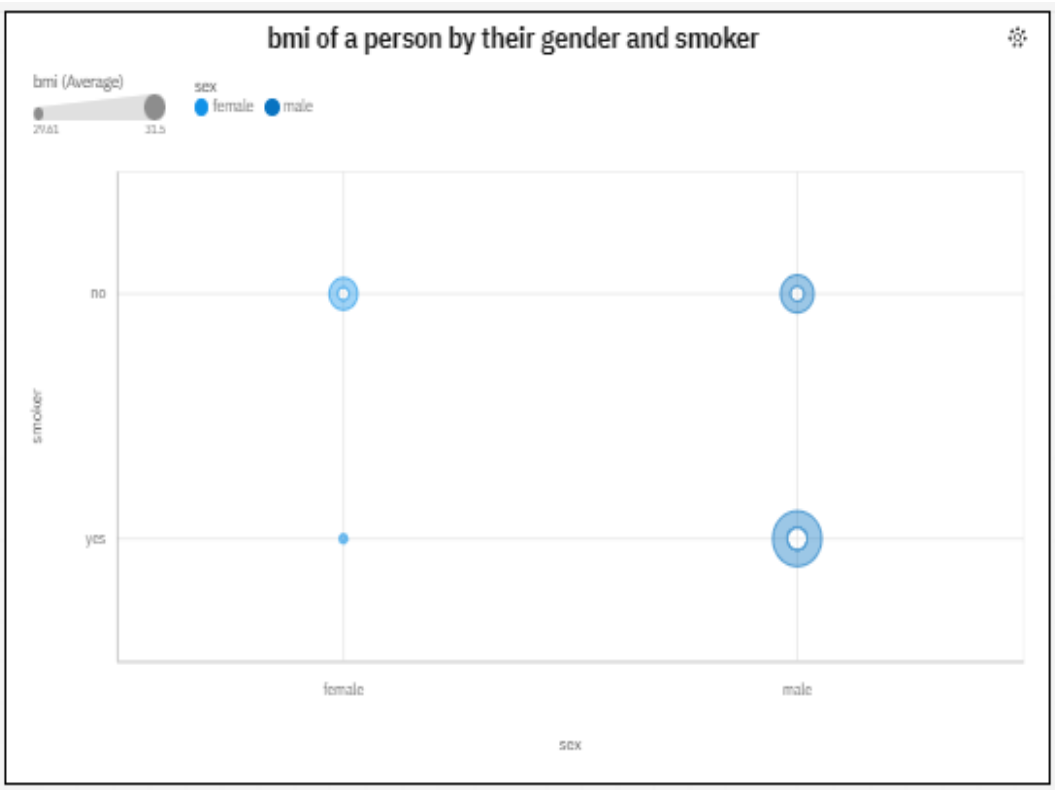

BMI of a person based on their age
34
33
32
31
30
29
28
27
bmi (Average)
15
20
25
30
35
40
45
50
55
60
65
70
age (Average)

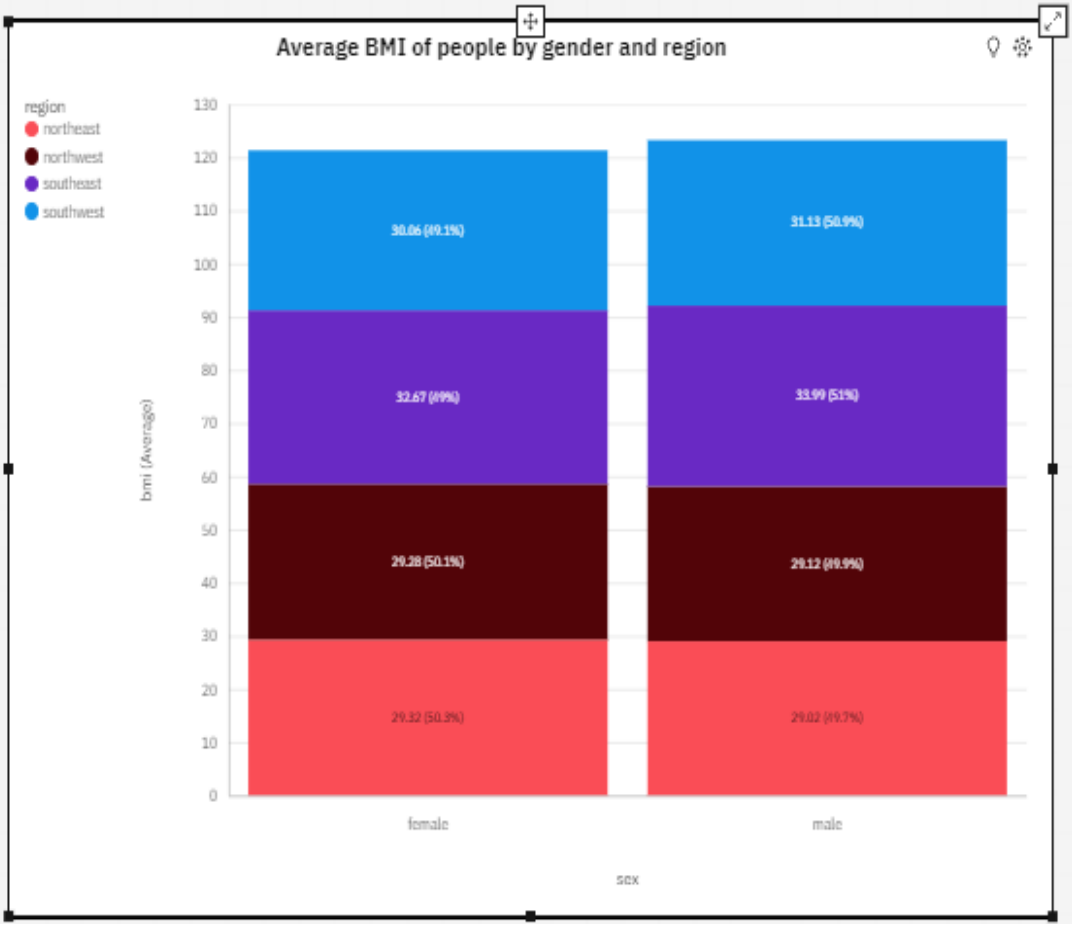

Average Number of children by age and smoker or not
smoker
no
yes
children (Average)
2.5
2
1.5
1
0.5
0
18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64
age

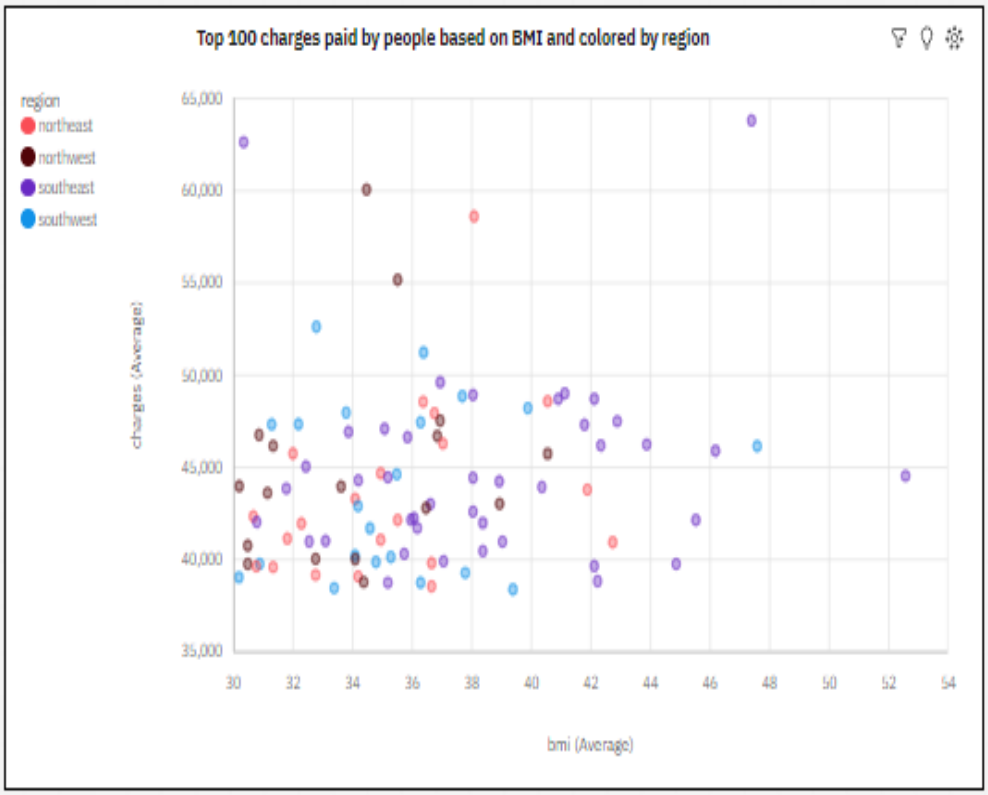

The average age of people according to their region and gender
age (Average)
region
northeast
northwest
southeast
southwest
sex
female
male

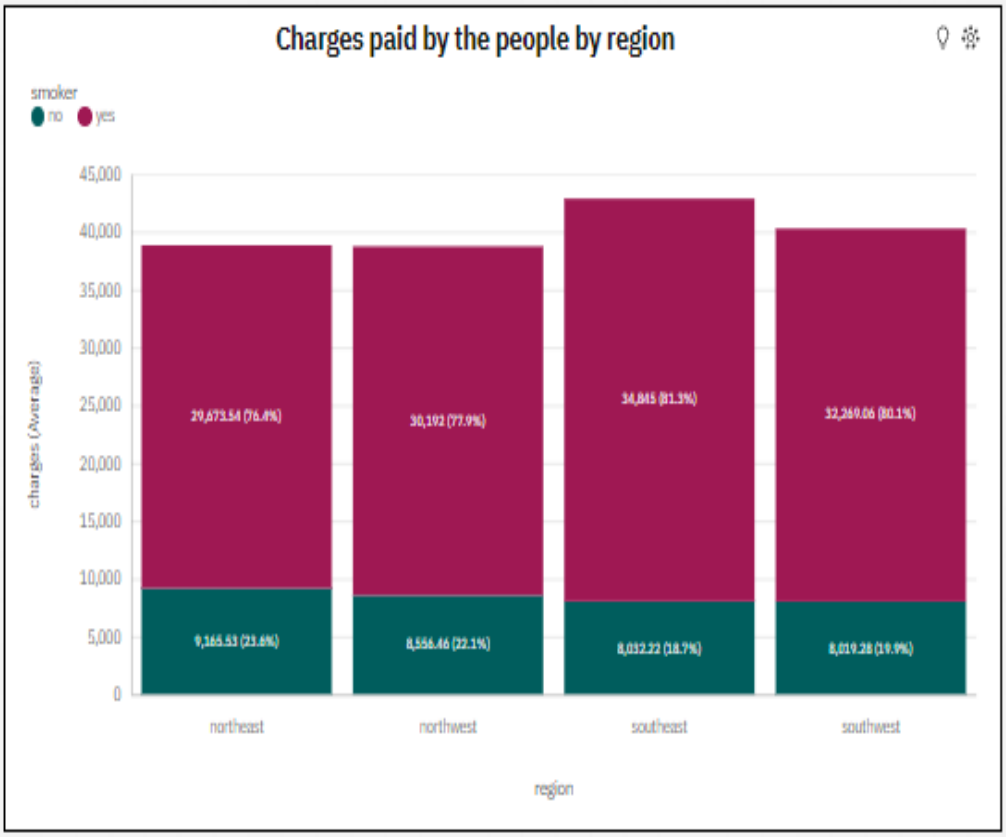

Charges paid by people according to their age and smoker
smoker
no
yes
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
charges (Average)
27,030.15
28,126.72
29,370.77
29,915.19
30,132.32
33,737.07
32,984.95
37,147.59
38,014.57
40,630.7
3,364.78
5,368.1
5,566.96
6,365.35
7,530.77
8,466.81
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)

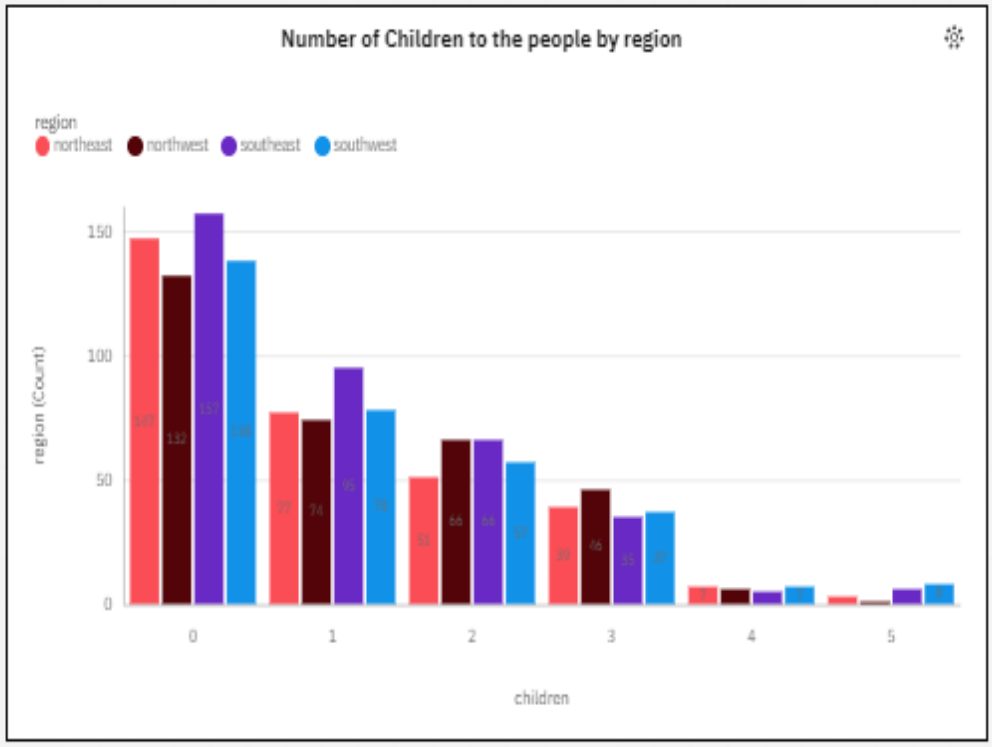

Charges paid by people according to their gender, region and smoker
charges (Average)
36,029.84
7,609
region - smoker
northeast | no
northeast | yes
northwest | no
northwest | yes
southeast | no
southeast | yes
southwest | no
southwest | yes
female | 29,670.82
female | 31,687.99
male | 36,029.84
female | 33,034.82
female | 28,032.05
male | 30,926.25
male | 32,598.86
male | 30,713.18

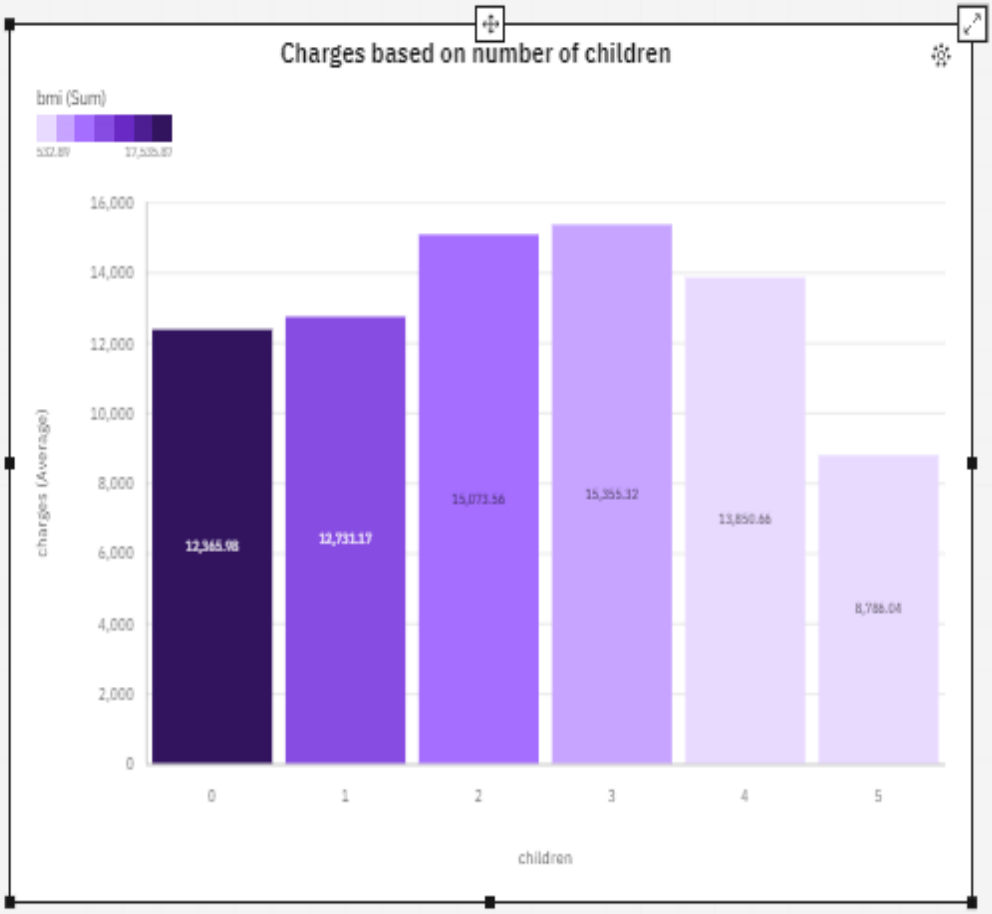

bmi of a person by their gender and smoker
bmi (Average)
29.61
31.5
sex
female
male
smoker
no
yes
female
male
sex


Average BMI of people by gender and region
region
northeast
northwest
southeast
southwest
bmi (Average)
130
120
110
100
90
80
70
60
50
40
30
20
10
0
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%)
female
male
sex


Top 100 charges paid by people based on BMI and colored by region
region
northeast
northwest
southeast
southwest
65,000
60,000
55,000
50,000
45,000
40,000
35,000
charges (Average)
30
32
34
36
38
40
42
44
46
48
50
52
54
bmi (Average)


Charges paid by the people by region
smoker
no
yes
45,000
40,000
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
charges (Average)
29,673.54 (76.4%)
30,192 (77.9%)
34,845 (81.3%)
32,269.06 (80.1%)
9,165.53 (23.6%)
8,556.46 (22.1%)
8,032.22 (18.7%)
8,019.28 (19.9%)
northeast
northwest
southeast
southwest
region

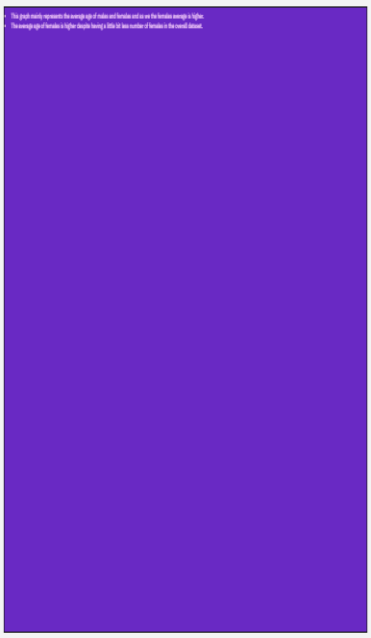

Number of Children to the people by region
region
northeast
northwest
southeast
southwest
region (Count)
150
100
50
0
0
1
2
3
4
5
children

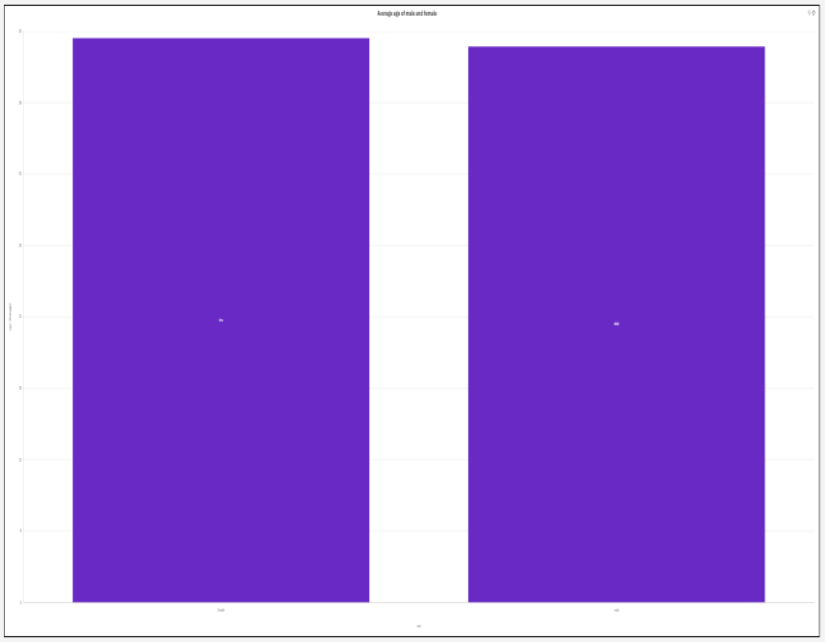

Charges based on number of children
bmi (Sum)
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
charges (Average)
12,365.98
12,731.17
15,071.56
15,355.32
13,850.66
8,786.04
0
1
2
3
4
5
children

Story

Medical Care Costs Story

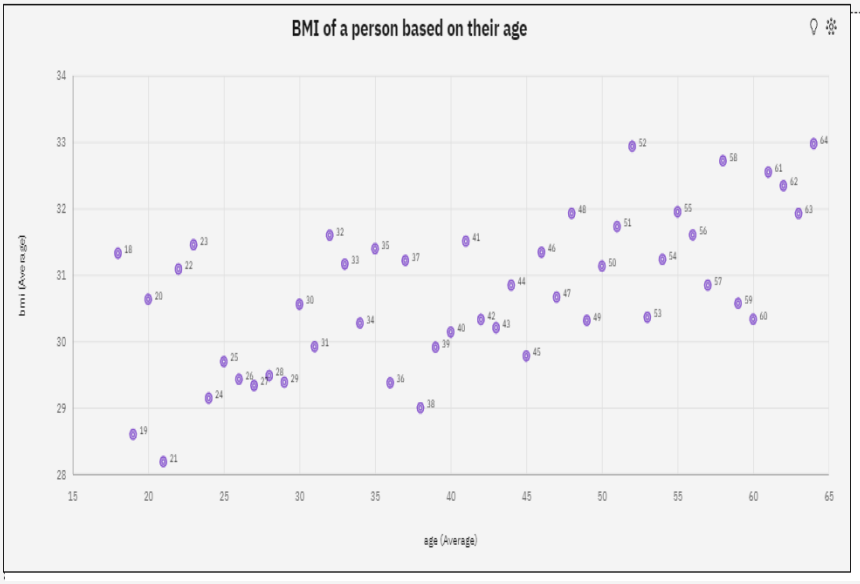
Medical Care Costs Story





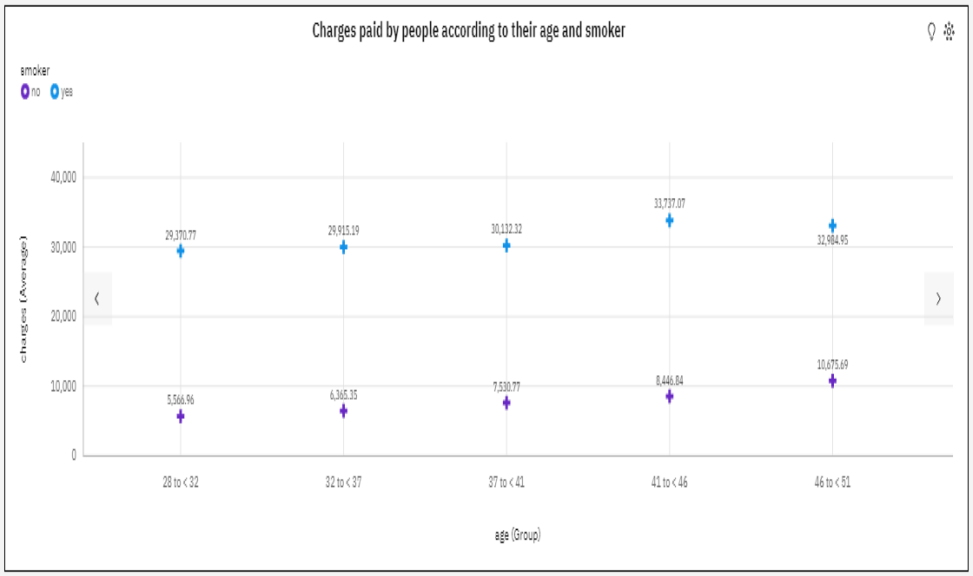
Medical Care Costs Story

- As age is increasing the average BMI of person also increases. This means BMI and age are linearly proportional.
- The maximum value of BMI by is like in middle age group its little bit higher but is age increases the BMI value is getting decreased.



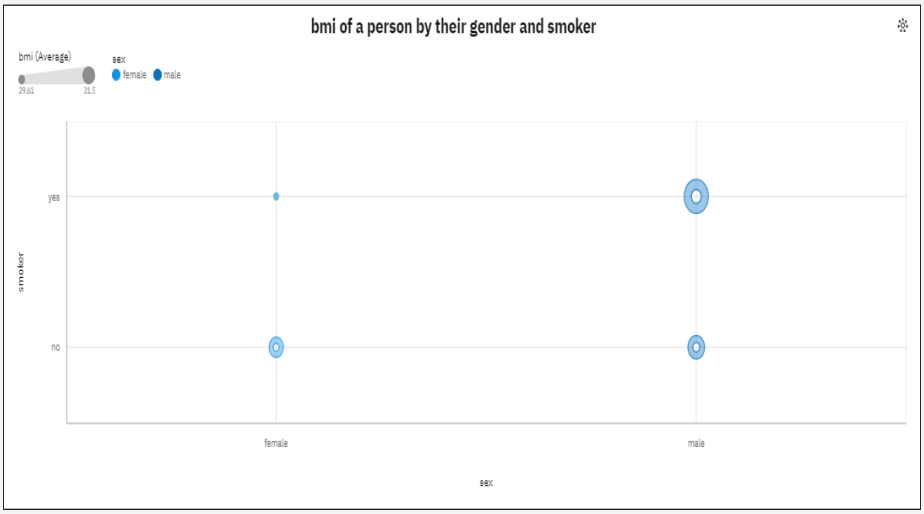
Medical Care Costs Story

- Smoker of any age are paying more than non-smokers, the value is also almost 3 to 5x higher.
- Charges are getting increased as the age is also increasing in both scenarios.



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.



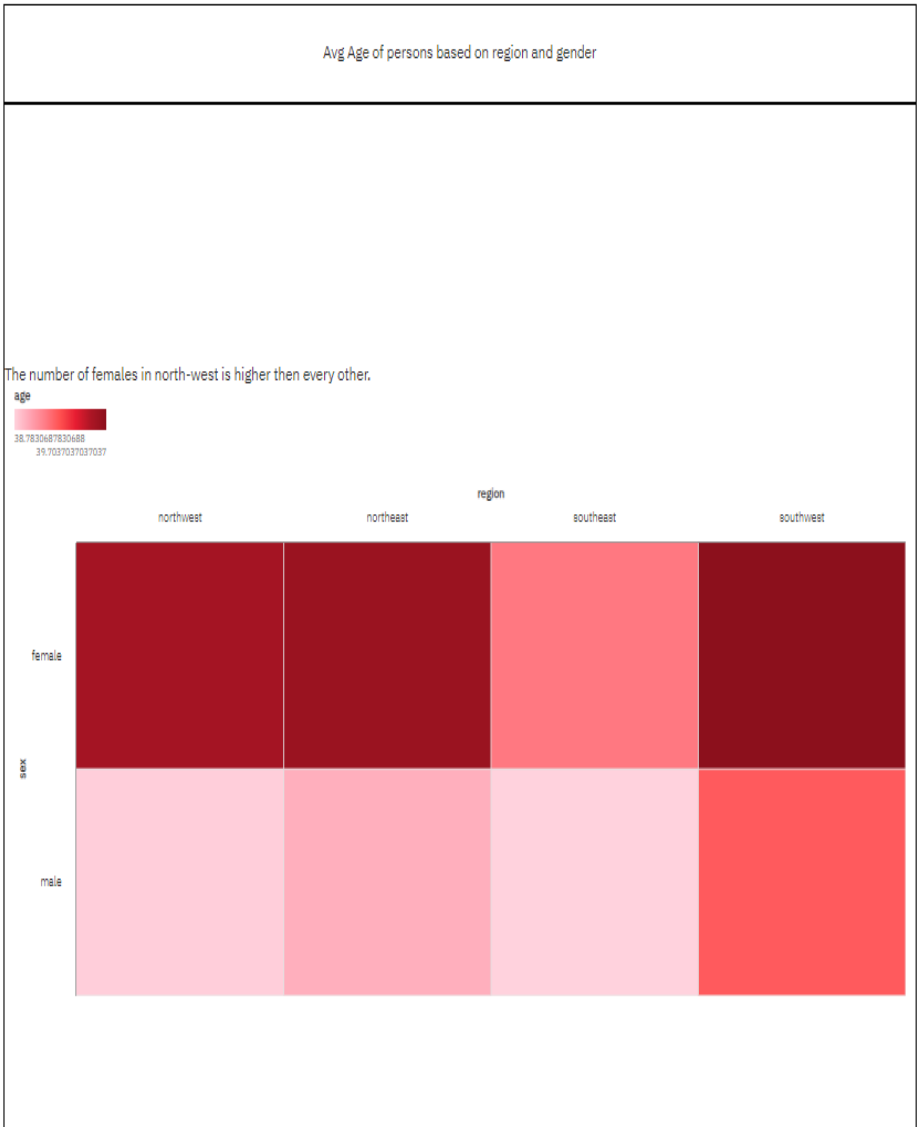
Medical Care Costs Story

- south-east region people, both men women are paying more charges compared to other regions.
- south-east region smokers are the once who paying more charges.
- Out of all as we have seen smokers tend to pay more irrespective of region.

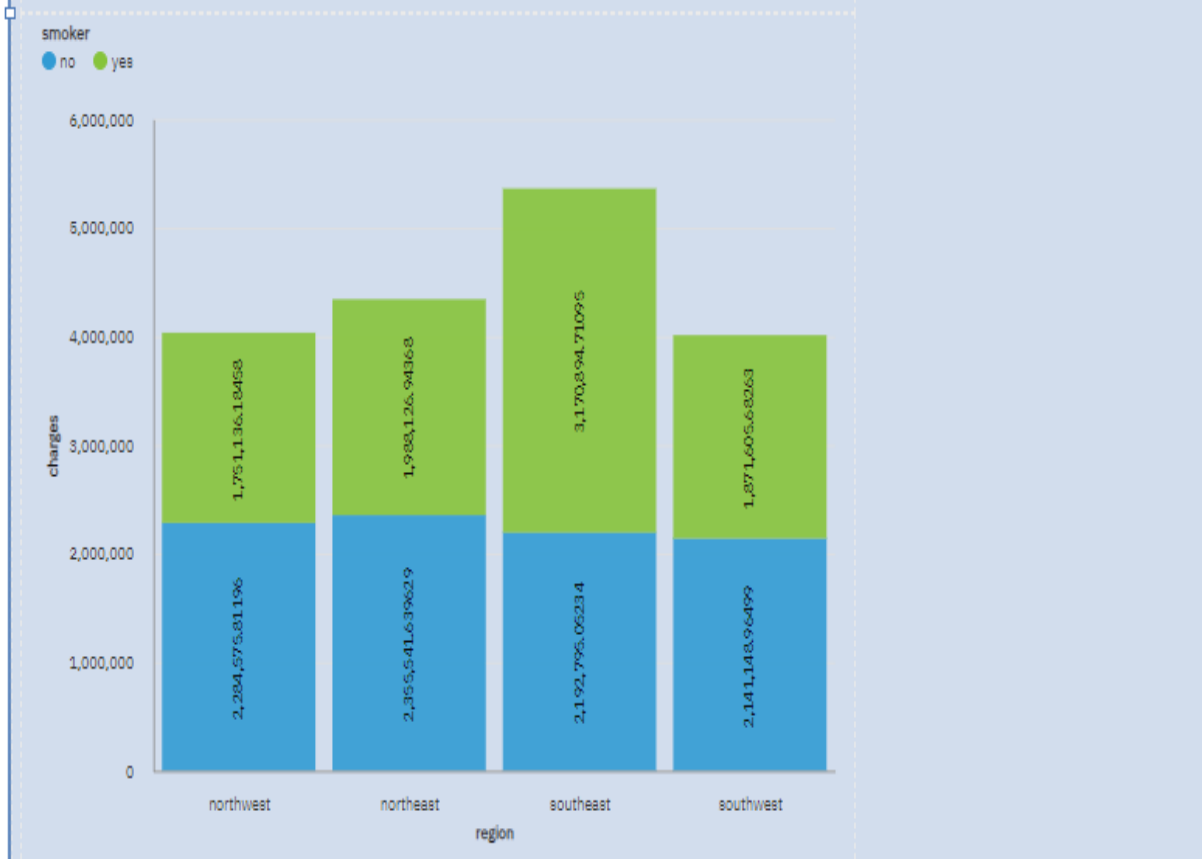
Report

Medical_Care_Costs_report

Average age of person based on region and gender



region
northwest
northeast
southeast
southwest
22,000
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
bmi
4,869.8
5,717.47
4,721.215
4,801.586
5,074.1
6,424.11
4,731
4,688.345
female
male
sex


smoker
no
yes
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
charges
1,751,136.18458
1,983,126.94363
3,170,894.71095
1,871,605.68363
2,284,575.81196
2,355,541.639629
2,192,795.05234
2,141,148.96499
northwest
northeast
southeast
southwest
region

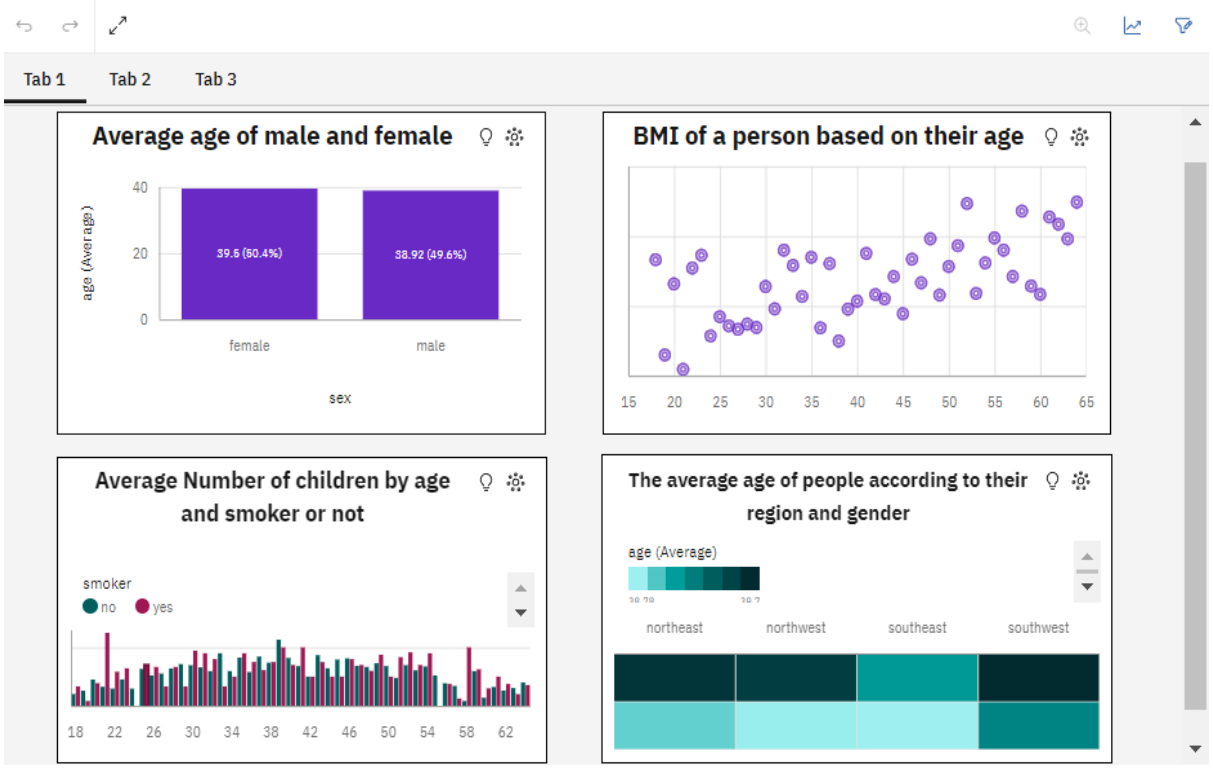
Web Integration

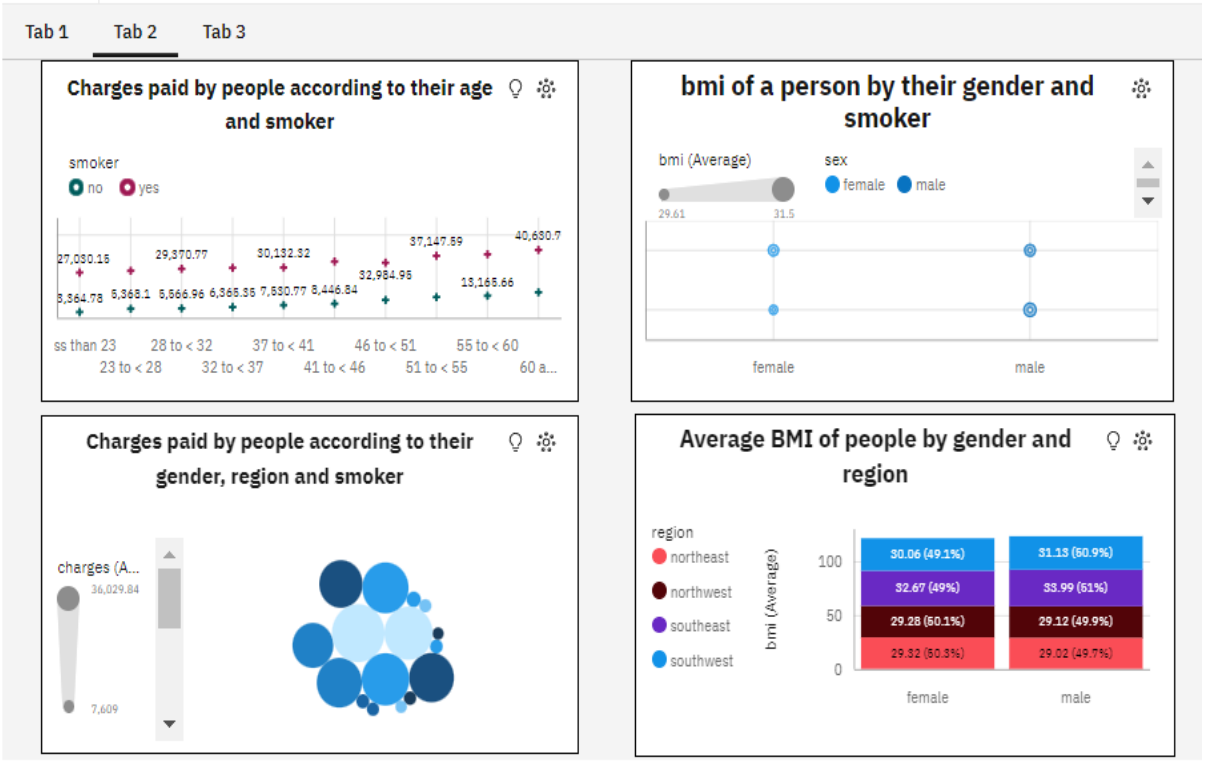
Medical Care Costs Analysis in India

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

Dashboard


Tab 1
Tab 2
Tab 3
Average age of male and female
40
20
0
age (Average)
39.5 (50.4%)
38.92 (49.6%)
female
male
sex
BMI of a person based on their age
15 20 25 30 35 40 45 50 55 60 65
Average Number of children by age and smoker or not
smoker
no
yes
18 22 26 30 34 38 42 46 50 54 58 62
The average age of people according to their region and gender
age (Average)
northeast
northwest
southeast
southwest


Tab 1
Tab 2
Tab 3
Charges paid by people according to their age and smoker
smoker
no
yes
27,080.15
29,370.77
30,132.32
37,147.69
40,680.7
32,984.95
13,165.66
3,364.78
5,368.1
5,566.96
6,366.38
7,630.77
8,446.84
ss 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 a...
bmi of a person by their gender and smoker
bmi (Average)
29.61
31.5
sex
female
male
female
male
Charges paid by people according to their gender, region and smoker
charges (A...
36,029.84
7,609
Average BMI of people by gender and region
region
northeast
northwest
southeast
southwest
bmi (Average)
100
50
0
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%)
female
male

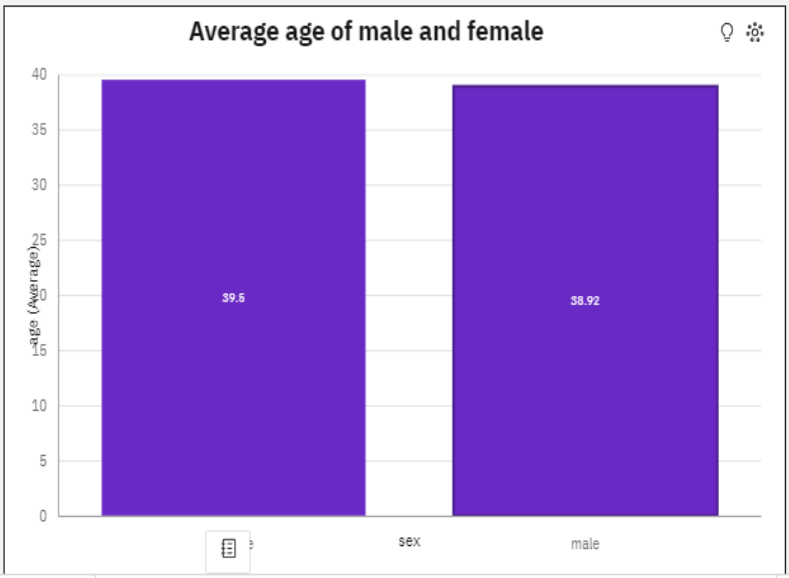
Tab 1
Tab 2
Tab 3
Top 100 charges paid by people based on BMI and colored by region
region
northeast
northwest
southeast
southwest
25
30
35
40
45
50
55
Number of Children to the people by region
region
northeast
northwest
southeast
southwest
0
1
2
3
4
5
Charges paid by the people by region
smoker
no
yes
Charges based on number of children
bmi (Sum)
532.89
17,535.87
0
1
2
3
4
5

Story

Medical Care Costs Story
Prev scene
Next scene
Scene 1 of 7
0:00.0
0:05.0

Medical Care Costs Story

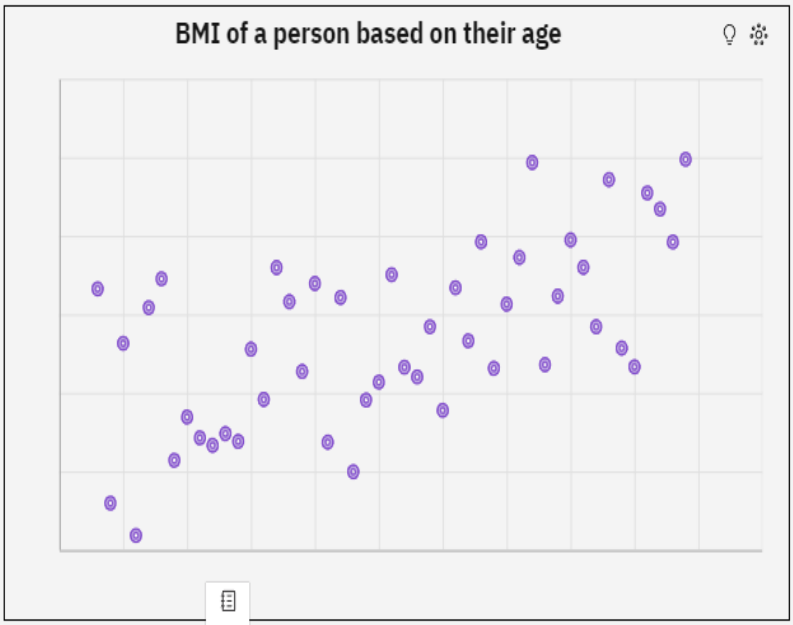
- This graph mainly represents the average age of males and females and as we the females average is higher.
- The average age of females is higher despite having a little bit less number of females in the overall dataset.



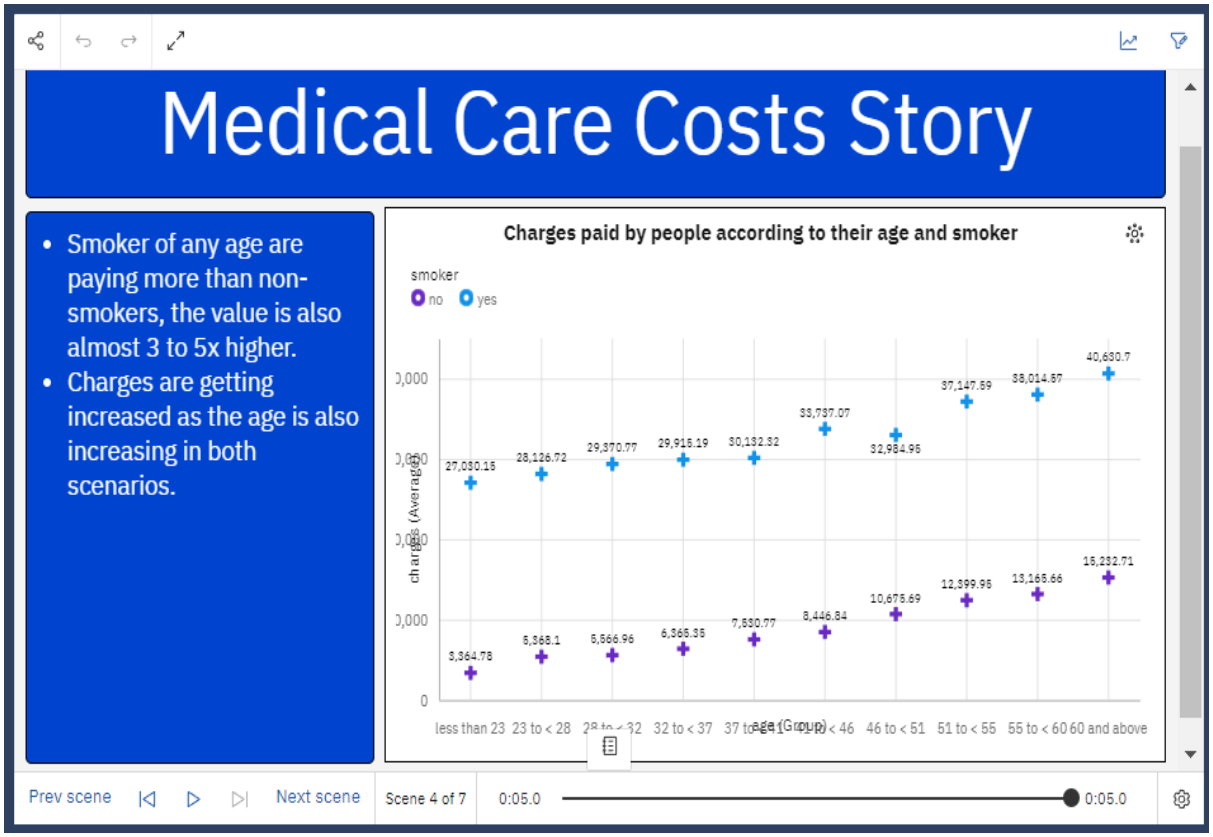
Prev scene | Next scene | Scene 2 of 7 | 0:05.0 | 0:05.0

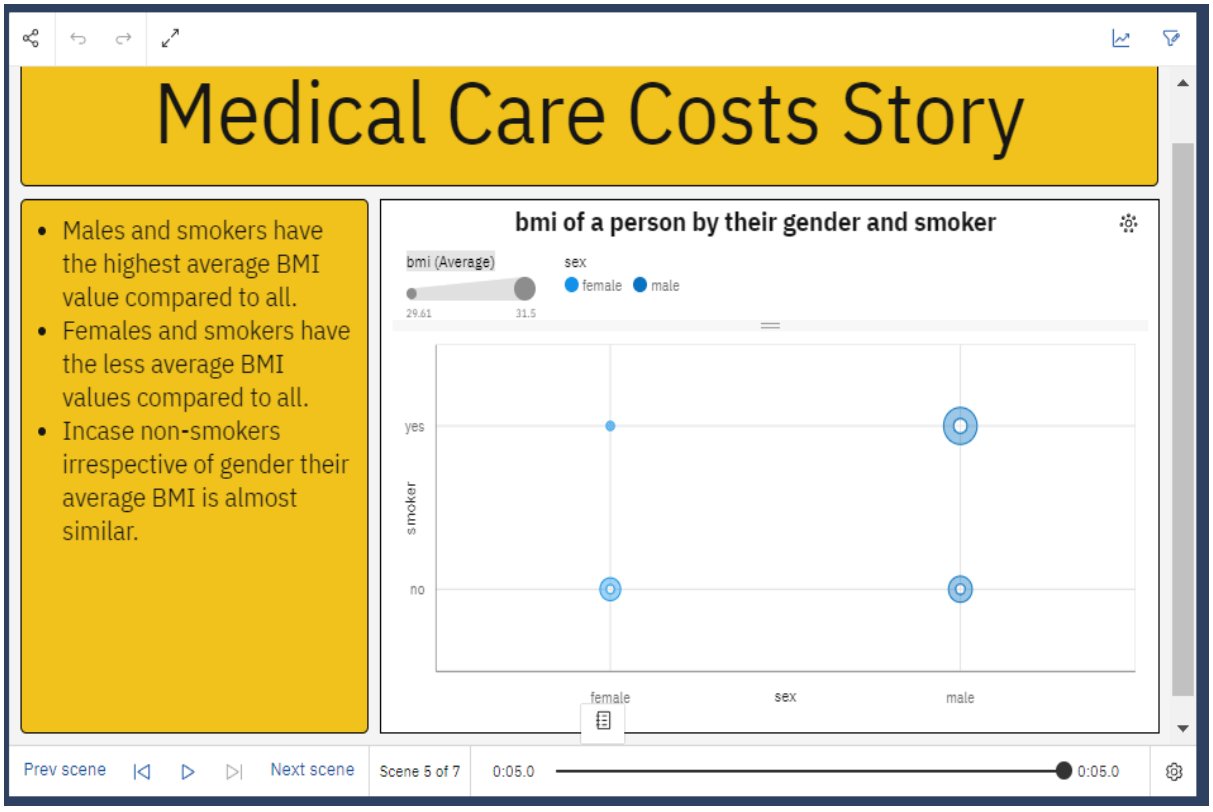
Medical Care Costs Story

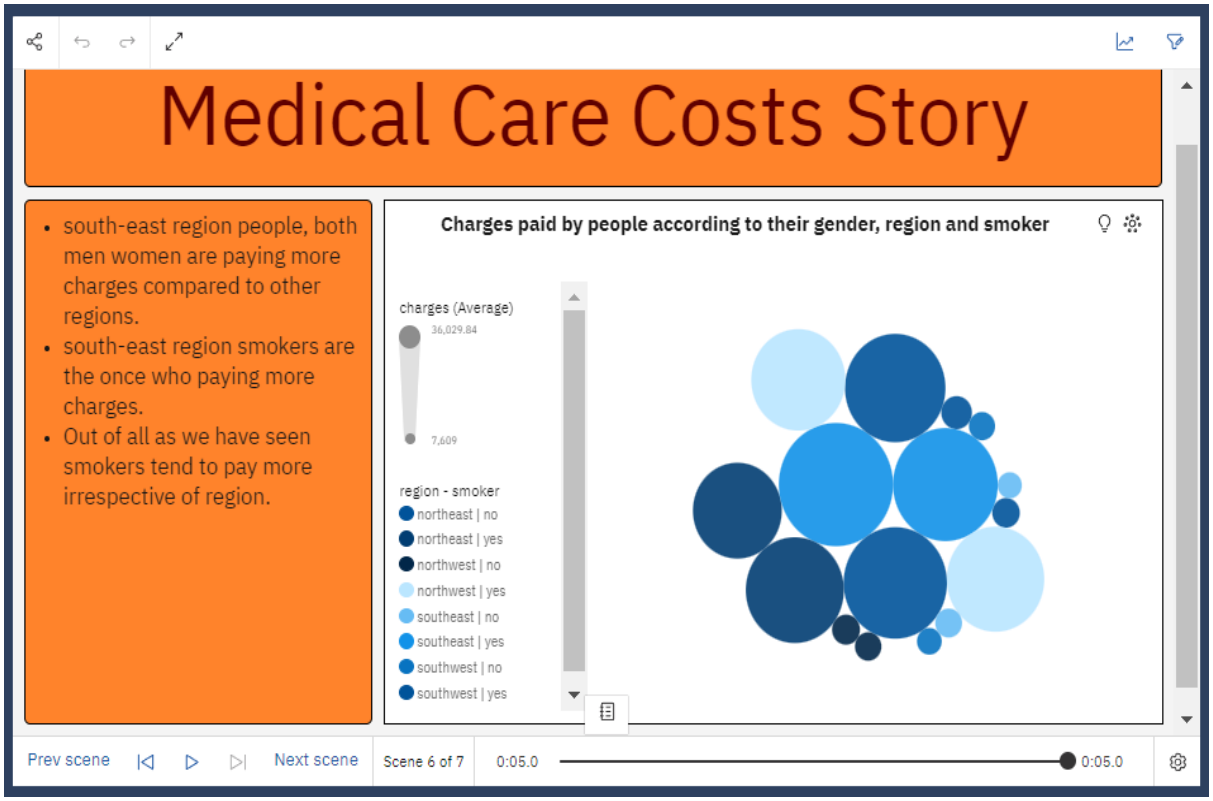
- As age is increasing the average BMI of person also increases. This means BMI and age are linearly proportional.
- The maximum value of BMI by is like in middle age group its little bit higher but is age increases the BMI value is getting decreased.

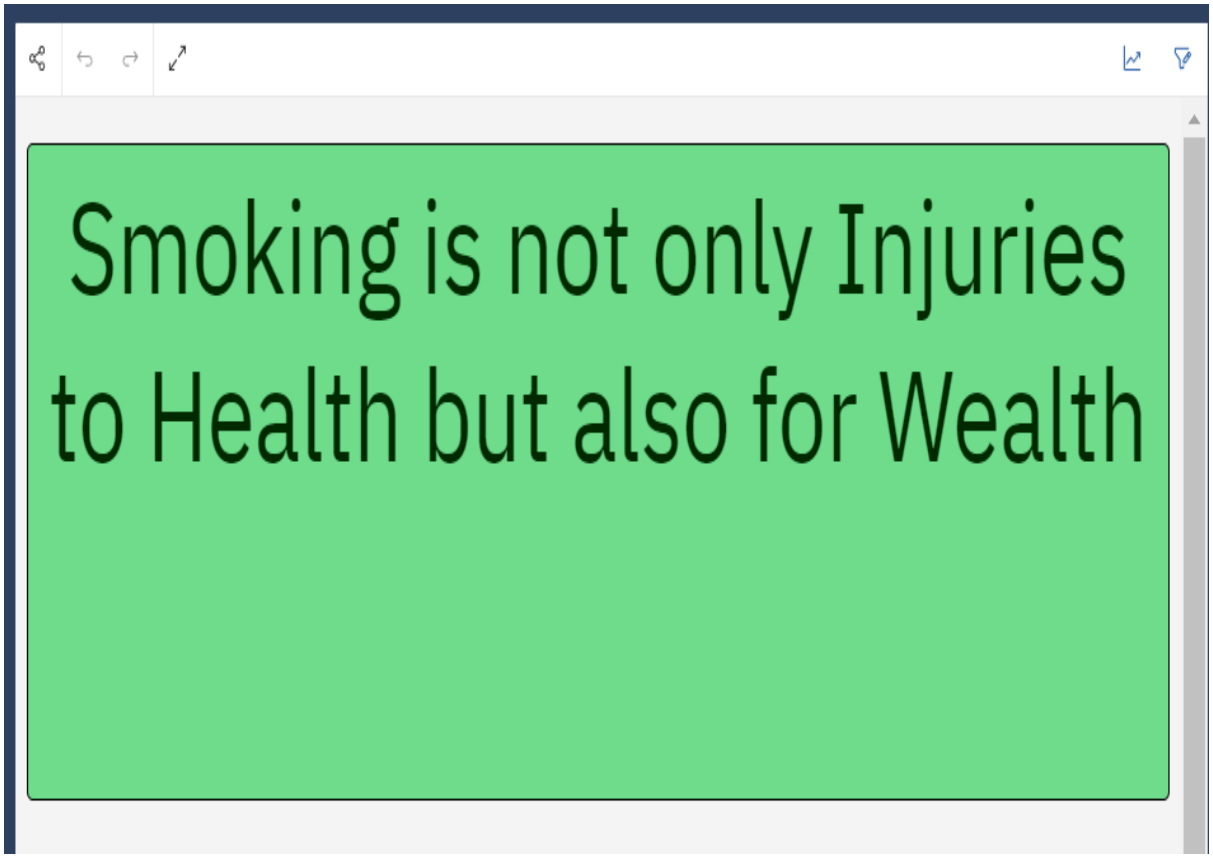


Prev scene | Next scene | Scene 3 of 7 | 0:05.0 | 0:05.0


Medical Care Costs Story
Smoker of any age are paying more than non-smokers, the value is also almost 3 to 5x higher.
Charges are getting increased as the age is also increasing in both scenarios.
Charges paid by people according to their age and smoker
smoker
no
yes
charges (Average)
27,030.15
28,126.72
29,370.77
29,915.19
30,132.32
33,737.07
32,984.96
37,147.69
38,014.87
40,630.7
3,364.78
5,368.1
5,566.96
6,365.35
7,530.77
8,446.84
10,676.69
12,399.95
13,165.66
15,232.71
less than 23
23 to < 28
32 to < 37
46 to < 51
51 to < 55
55 to < 60
60 and above
age (Group)
Prev scene
Next scene
Scene 4 of 7
0:05.0
0:05.0

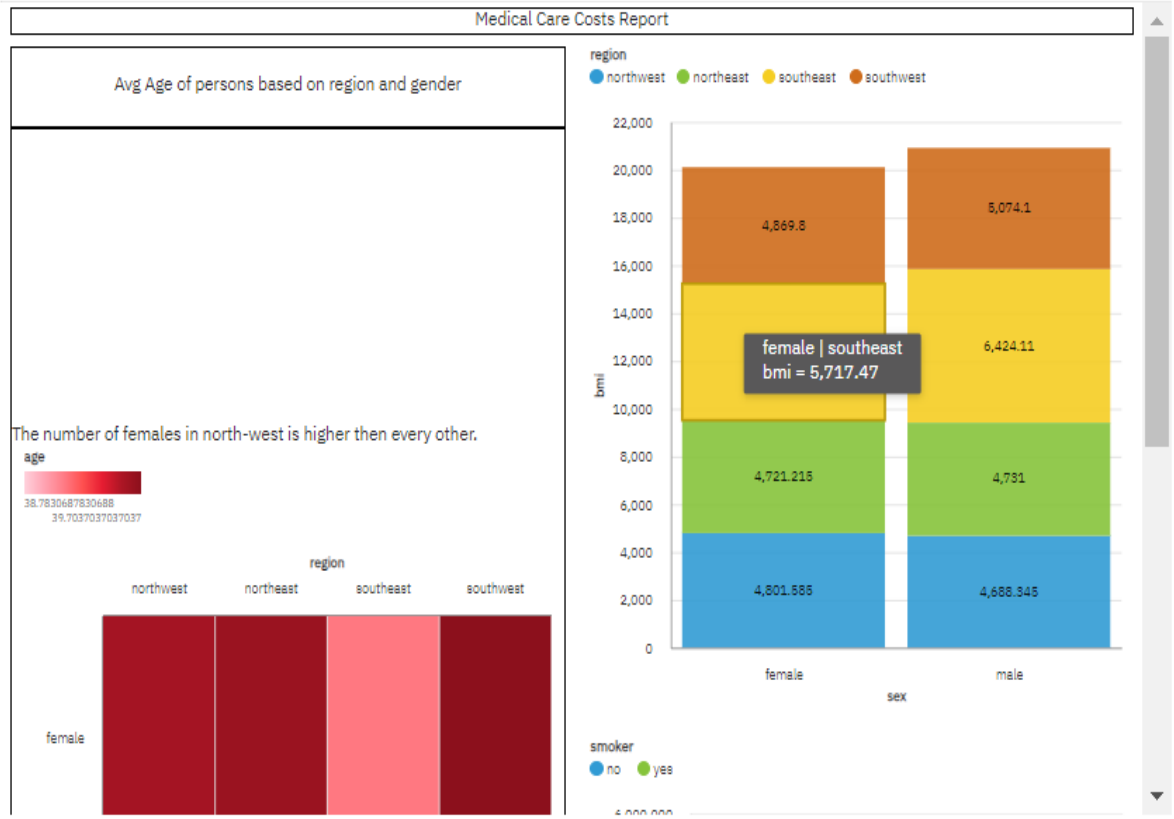

Medical Care Costs Story
Males and smokers have the highest average BMI value compared to all.
Females and smokers have the less average BMI values compared to all.
Incase non-smokers irrespective of gender their average BMI is almost similar.
bmi of a person by their gender and smoker
bmi (Average)
29.61
31.5
sex
female
male
yes
no
smoker
female
sex
male
Prev scene
Next scene
Scene 5 of 7
0:05.0
0:05.0

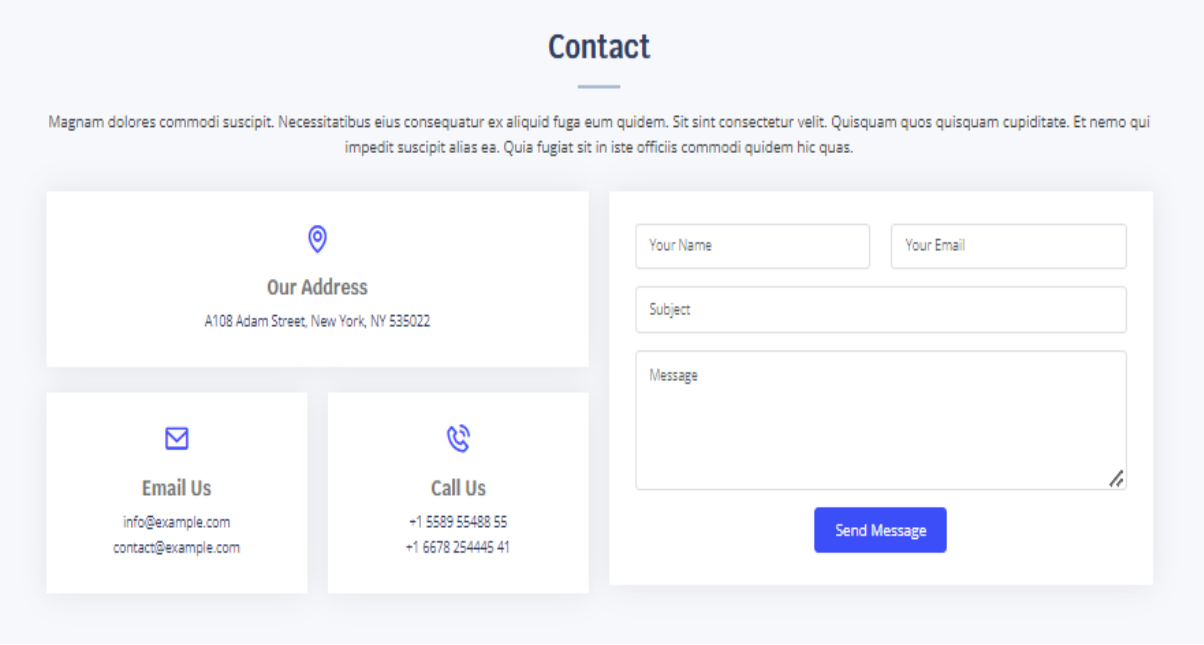

Medical Care Costs Story
south-east region people, both men women are paying more charges compared to other regions.
south-east region smokers are the once who paying more charges.
Out of all as we have seen smokers tend to pay more irrespective of region.
Charges paid by people according to their gender, region and smoker
charges (Average)
36,029.84
7,609
region - smoker
northeast | no
northeast | yes
northwest | no
northwest | yes
southeast | no
southeast | yes
southwest | no
southwest | yes
Prev scene
Next scene
Scene 6 of 7
0:05.0
0:05.0


Smoking is not only Injuries to Health but also for Wealth

Report

Medical_Care_Cost_Report





Advantages & Disadvantages

Advantages:

IBM provides powerful data visualization, Dash Boarding, and reporting capabilities that help

users quickly and easily access relevant insights. This allows businesses to make data-driven

decisions more efficiently and effectively.

- Higher ground gave the enemy the/an advantage.
- He has/enjoys an unfair advantage over us because of his wealth.
- His plan has the advantage of being less expensive than other options.
- He lacked the advantages of an advanced education.
- Speed is an advantage in most sports.
- External Failure Costs.

Disadvantages:

IBM COGNOS **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.

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

Application:

- IBM Benefits Summary. Health & Well being.
- Family Support. Tax-Advantaged Spending Accounts. Financial Benefits.
- Time Off & Leaves. Enrolling in Benefits. Resources.
- IBM COGNOS Business Intelligence is a web-based integrated business intelligence suite by IBM. It **provides a tool set for reporting 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.

Future Scope:

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

- 'Eagle' heralded a 127-qubit quantum breakthrough.
- Skills training pledged for 30 million learners.
- IBM Research started teaching AI to write code.
- The launch of IBM Consulting.
- An autonomous ship explored our oceans.
- The future of 'zero trust' got even more secure.