DATA ANALYTICS

ESTIMATION AND PREDICTION OF HOSPITALIZATION AND MEDICAL CARE COSTS

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Team Size : 5

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1.INTRODUCTION:

1.1 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 a young age is a top concern in global health, clinical practice, and public health.

Fast-growing healthcare costs have become a significant challenge in several developed countries. Because of the ageing populations and enhanced therapy of fundamental conditions, cardiac arrest is among the most complicated chronic disorders with a higher incidence. Data analytics which means analyzing raw data to make conclusions about that information

1.2 Purpose:

This Projects aims to estimate and identify the patterns and trends of medical care costs for a person

2.LITERATURE SURVEY:

2.1 Existing problem:

The prevalence of obesity, which is defined as a body mass index (BMI) greater than 30, has increased dramatically in the United States since the late 1990s. So much so that recently obesity has been officially recognized as a disease by the American Medical Association, an action that could put more emphasis on the health condition by doctors and insurance companies to minimize its adverse effects. Currently, rates of obesity exceed 30% in most sex and adult age groups, whereas its prevalence among children and adolescents, defined as a BMI of more than the 95th percentile, has reached 17%.

The alarming rates of the high prevalence of obesity have posed a significant public health concern as well as a substantial financial burden on our society because obesity is known to be a risk factor for many chronic diseases, such as type 2 diabetes, cancer, hypertension, asthma, myocardial infarction, stroke, and other conditions. To understand the economic burden of obesity, several studies have attempted to estimate the attributable costs of obesity, following the burden-of-illness literature on other disease areas. A previous cost-of-illness study estimated that healthcare spending attributable to the rising prevalence of obesity has increased by 27% between 1987 and 2001

2.2 Proposed solution:

Prevention is important, but designing effective prevention efforts remains challenging. The drivers of the of the obesity epidemic are complex and multifaceted, so there is likely no single solution. Continued investment in research on effective prevention strategies is needed, especially in support of what the Institute of Medicine and National Institutes of Health refer to as new “systems” approaches. Indeed, it may be critical to coordinate policy across many domains and levels of scale in order to see a rapid change in the obesity academic. To be effective, prevention efforts must focus not just on educating individuals or on changing environments, but on doing both together.

Data visualization or graphical representation of data help us visually explore and identify patterns and outliers in the data. Data exploration becomes easier and faster with dashboard, story, report. This will help to analyse, filter, summarize, and gain insights that helps to find solutions in easier way

3.THEORITICAL ANALYSIS:

3.1 Block diagram :

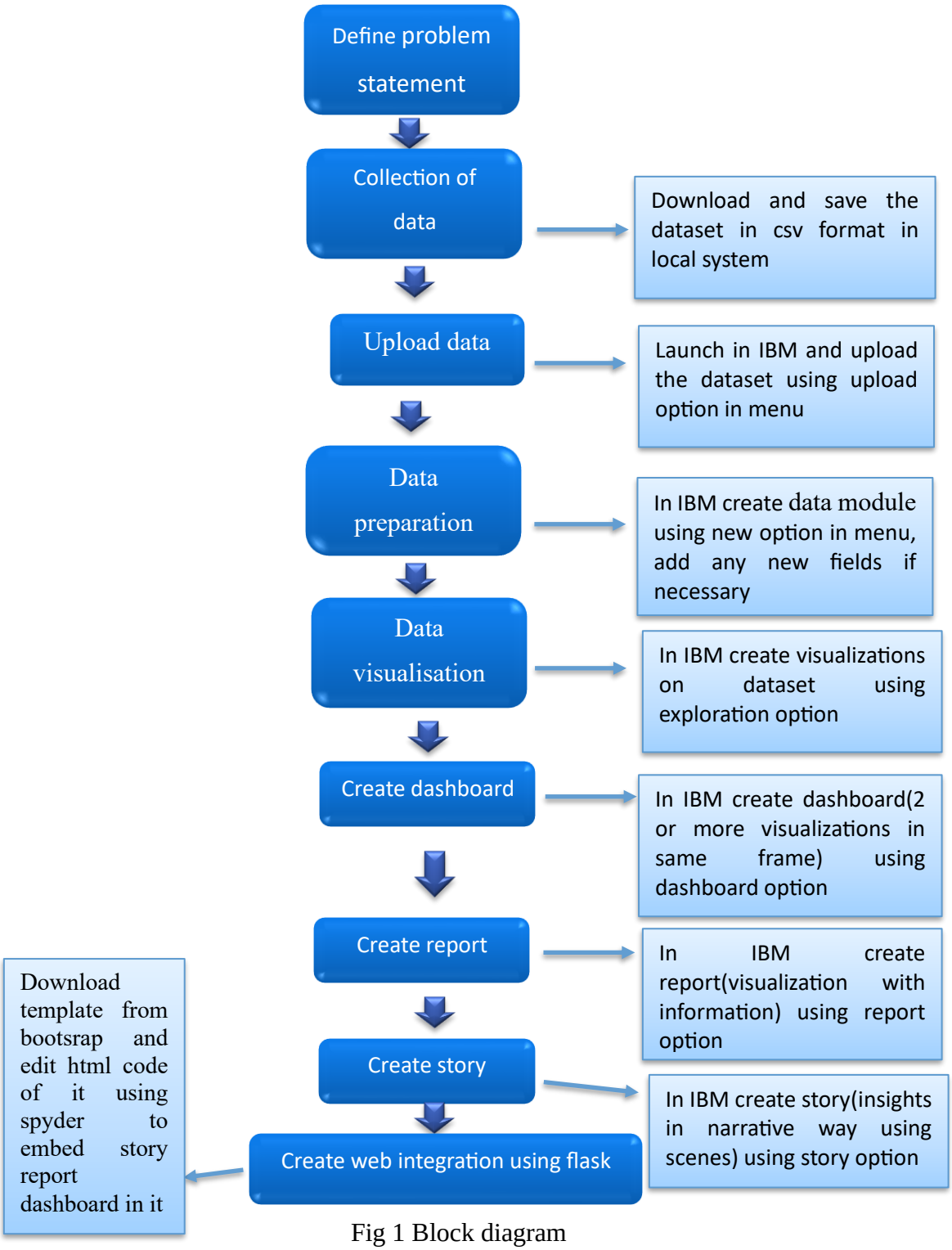


Fig 1 Block diagram

3.2Hardware/software designing:

Hardware requirements:

- Minimum system requirements(RAM-4GB, Quad code processor)

Software requirements:

- IBM
- Smartinternz
- Kaggel
- Excel
- Bootstrapmade
- Anaconda
- Spyder

4.RESULT:

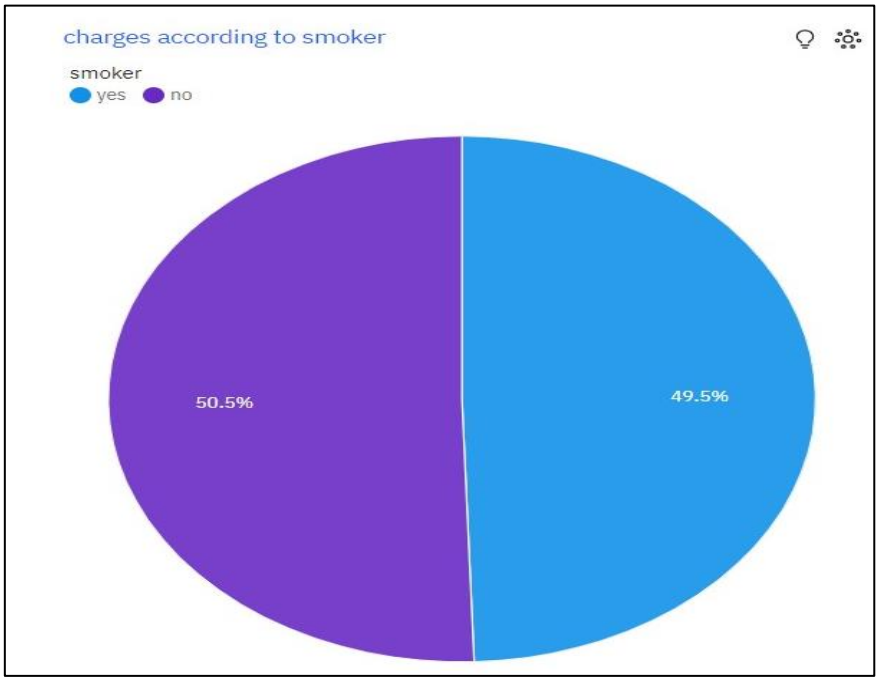


Fig 4.1 piechart of charges based on smoker

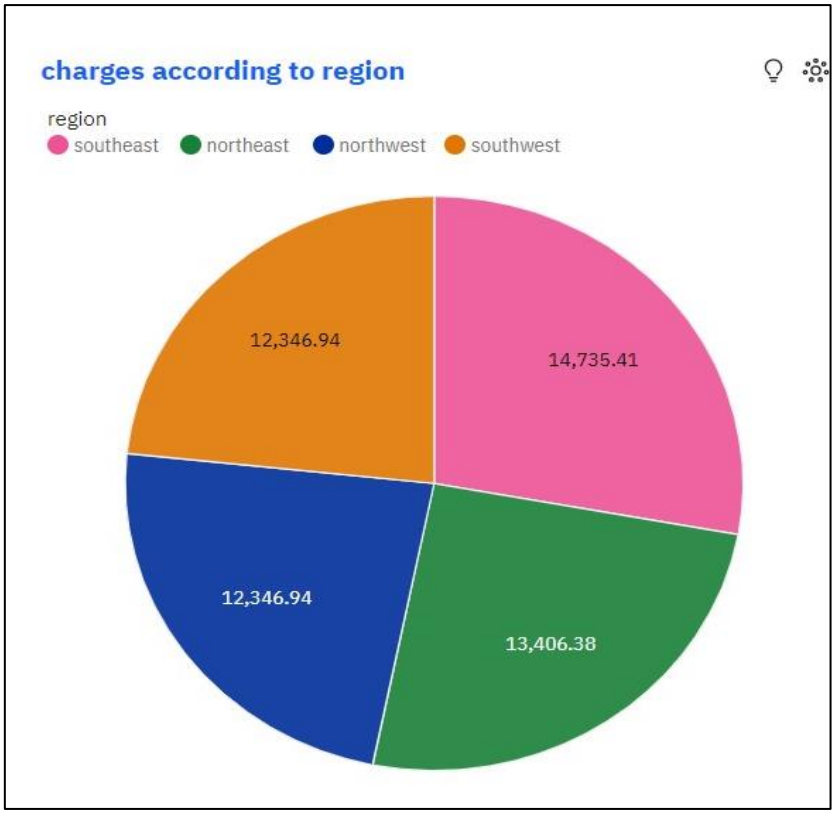


Fig 4.2 pie chart of average charges according to region

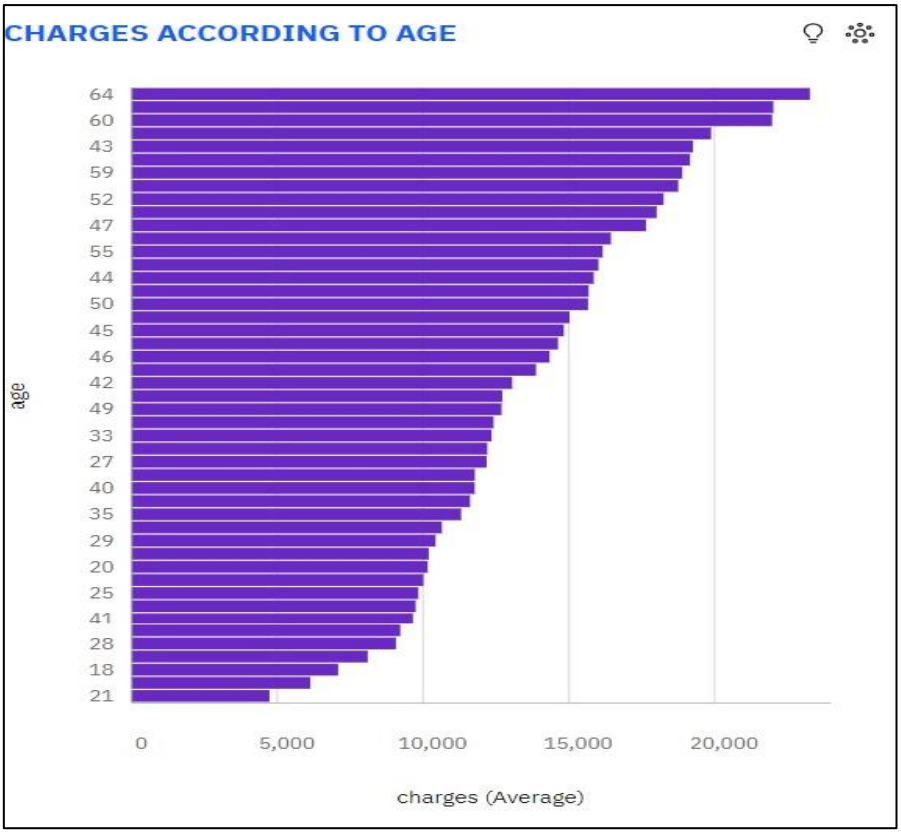


Fig 4.3 Bar chart of charges based on age

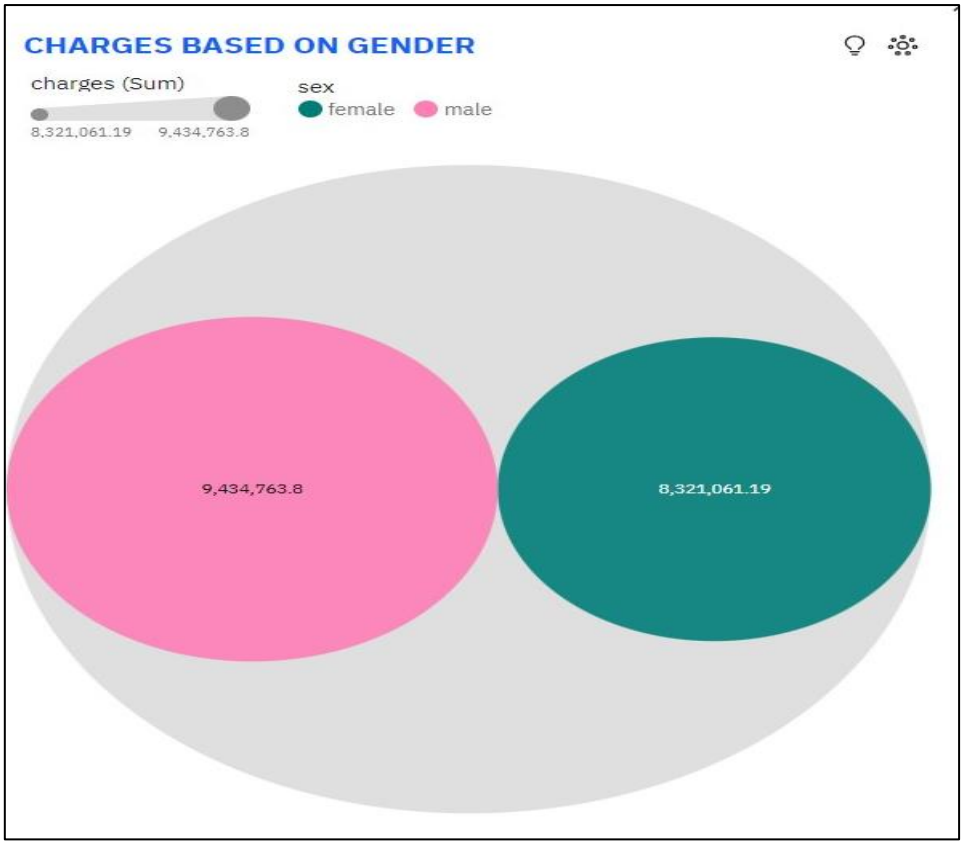


Fig 4.4 Hierachy bubble chart of charges based on gender

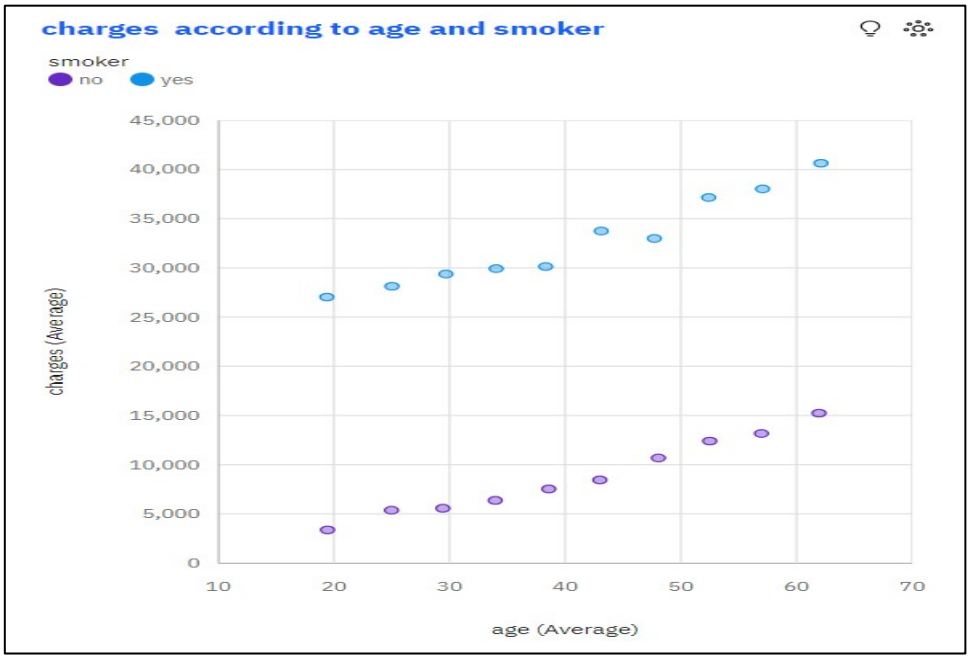


Fig 4.5 Scatterplot of charges based on age, smoker

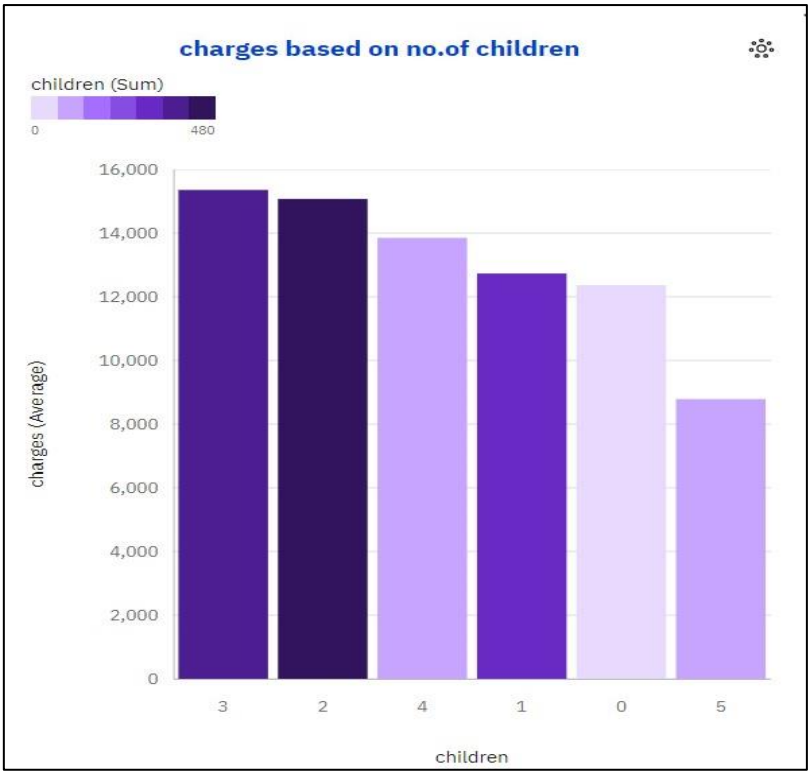


Fig 4.6 column chart of Charges based on number of children

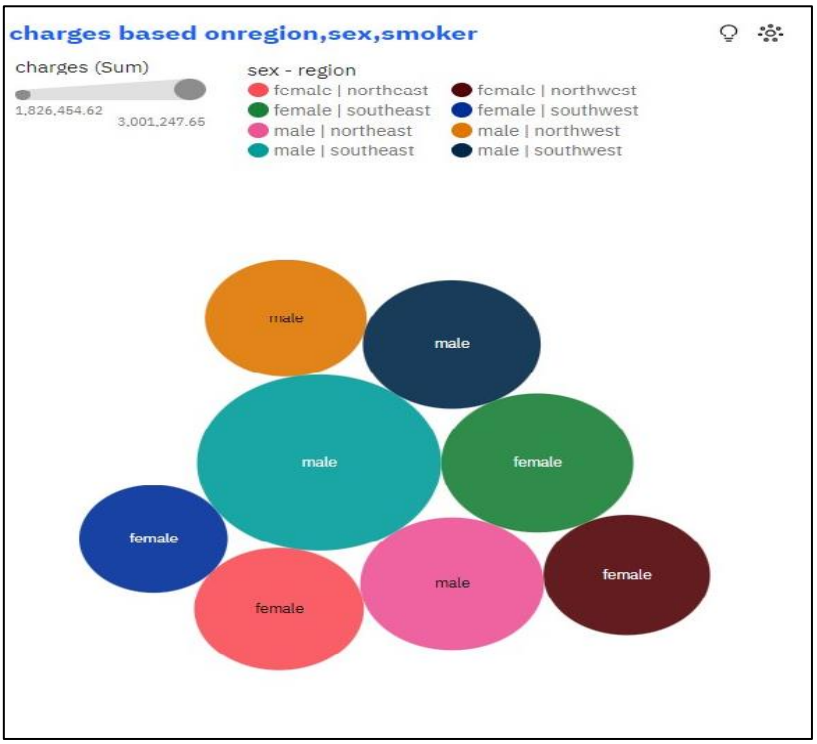


Fig 4.7 packed bubble of charges based on region, gender, smoker

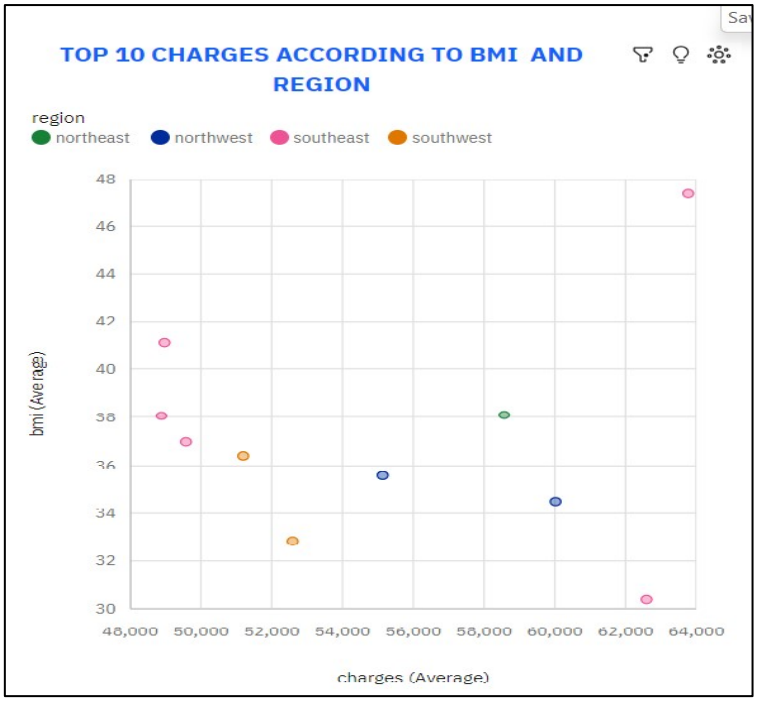


Fig 4.8 Scatter plot of top 10 charges based on BMI, region

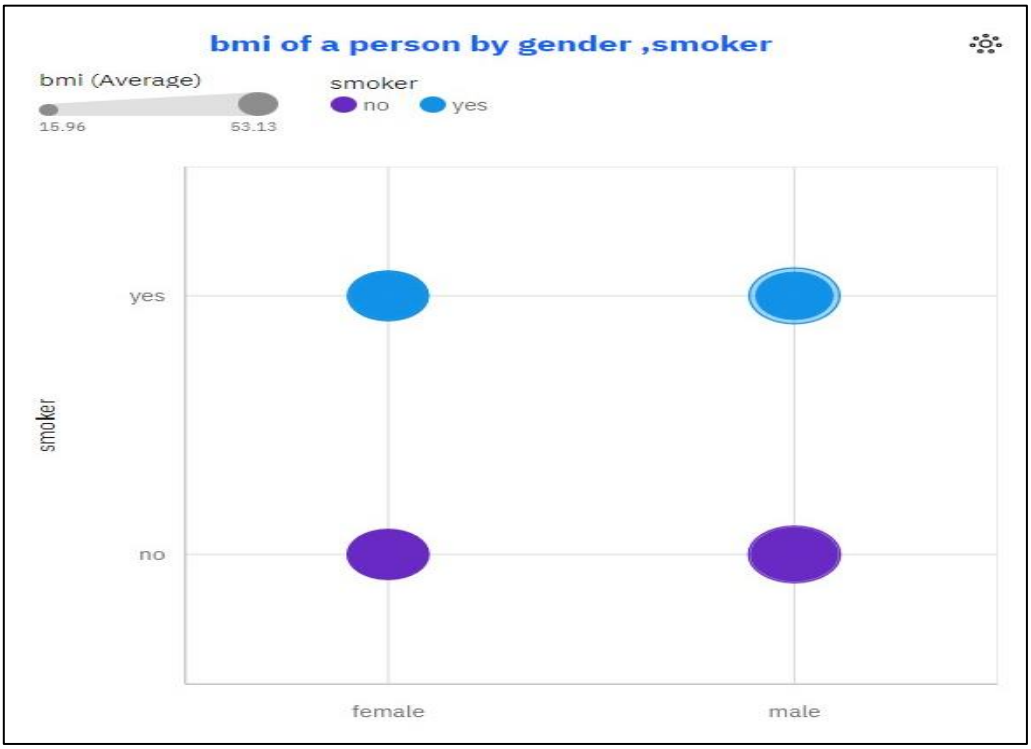


Fig 4.9 Bubble chart of BMI based on gender, smoker

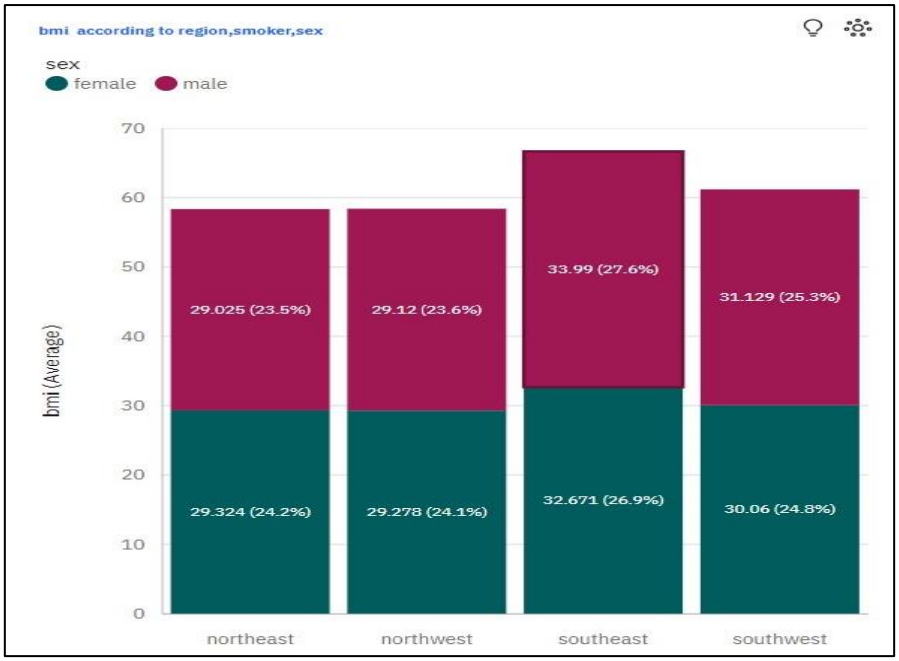


Fig 4.10 Stacked column chart of BMI based on region, smoker, gender

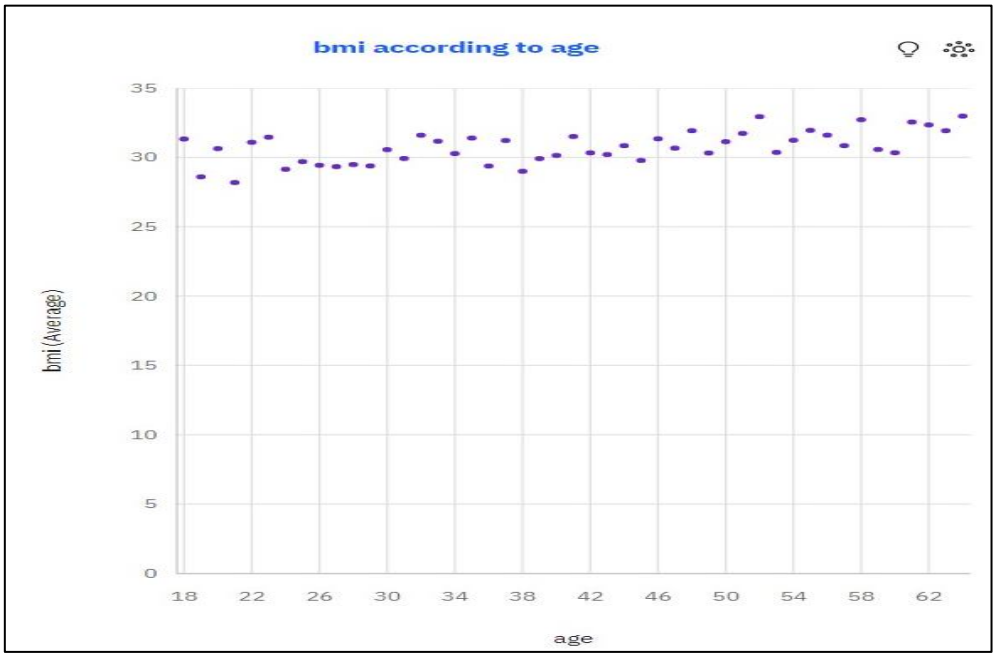


Fig 4.11 Scatter plot of BMI based on age group

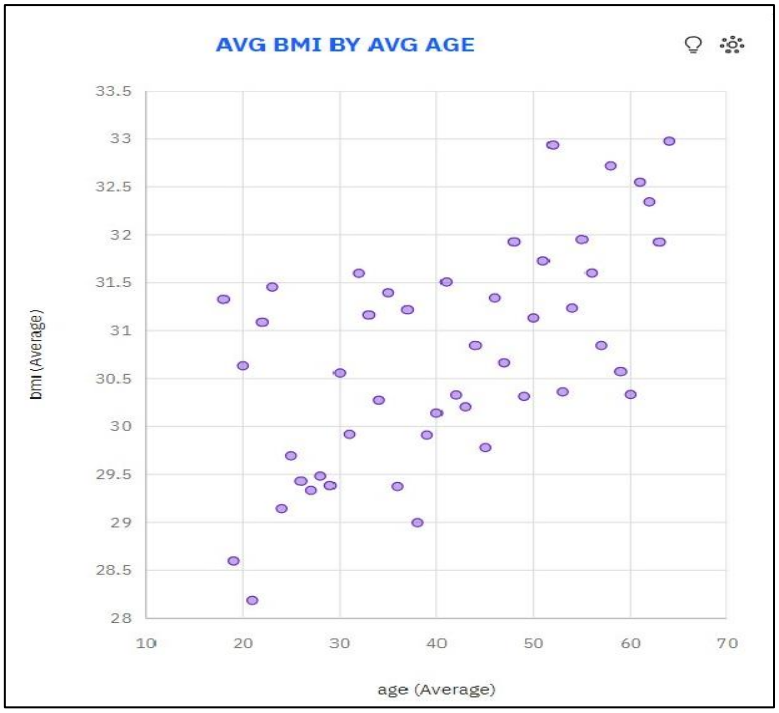


Fig 4.12 Average BMI based on average age

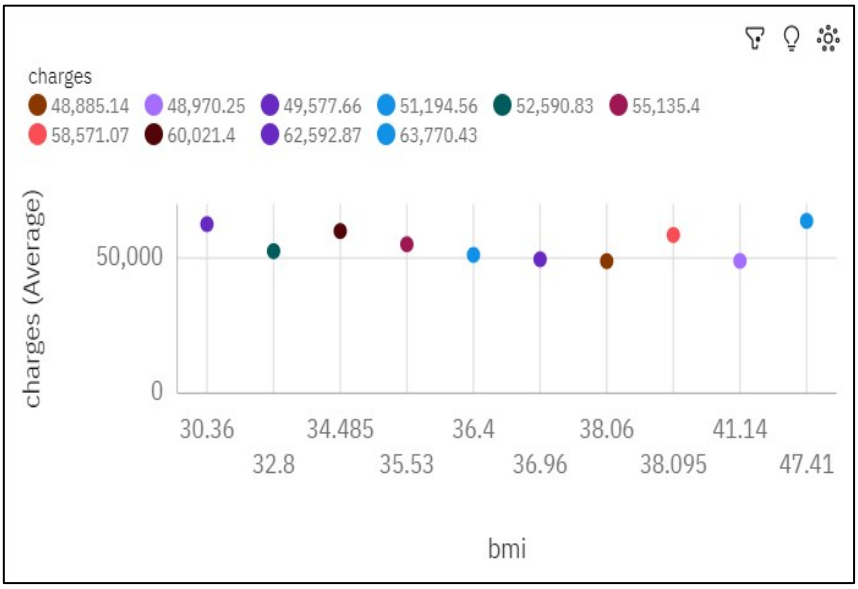


Fig 4.13 top 10 charges based on BMI

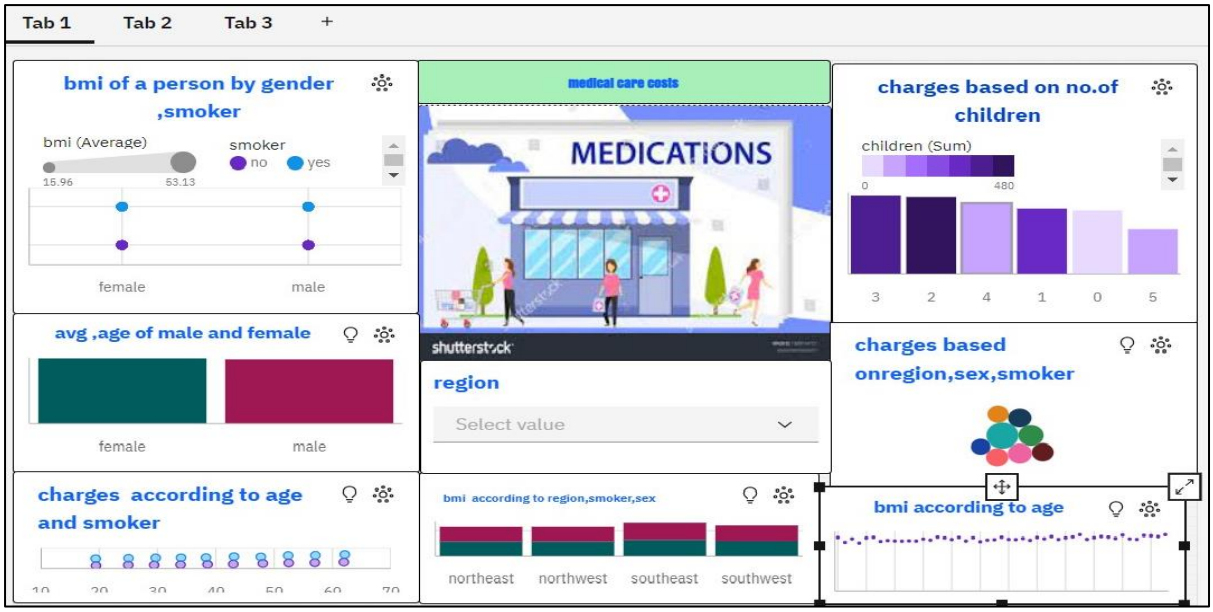


Fig 4.14 Dashboard tab1

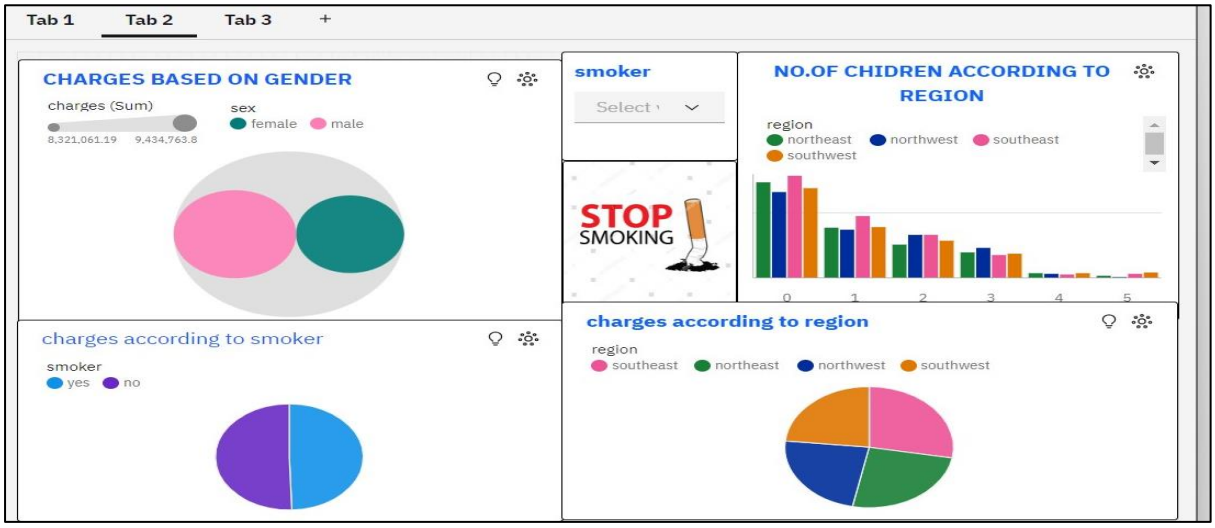


Fig 4.15 Dashboard tab 2

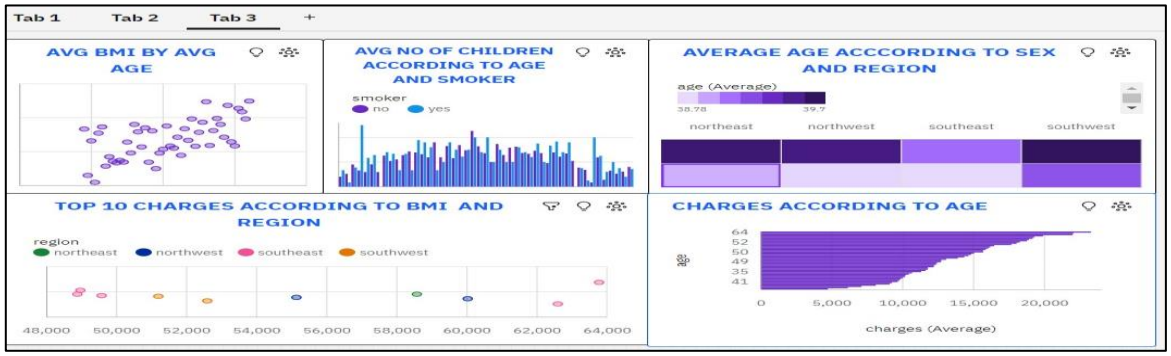


Fig 4.16 Dashboard tab 3

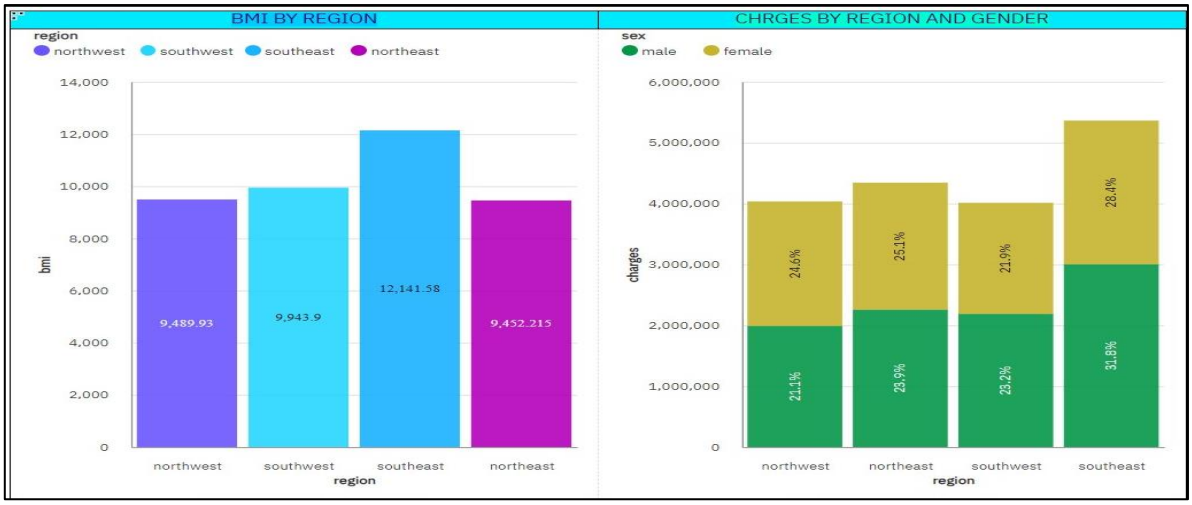


Fig 4.17 Report page1

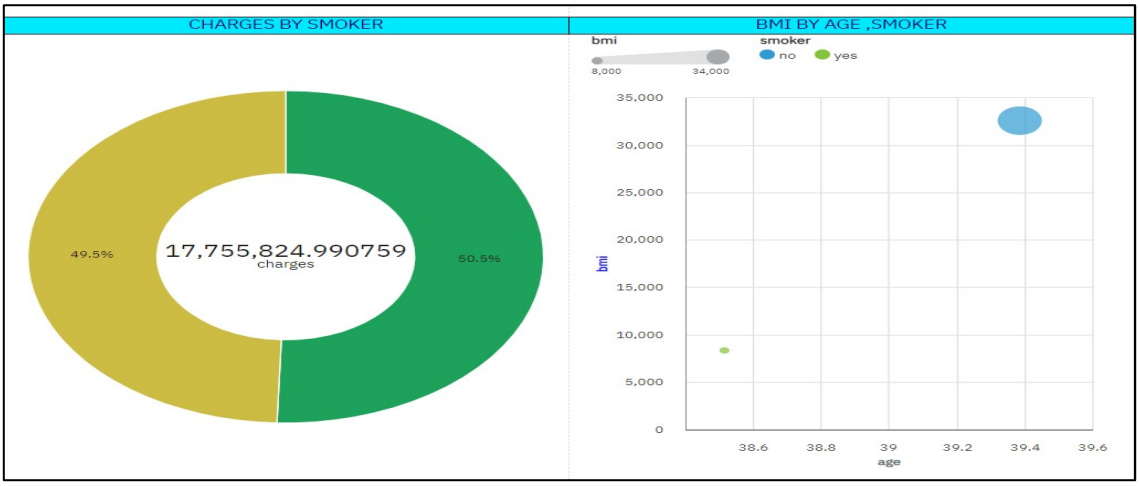


Fig4.18 Report page 1

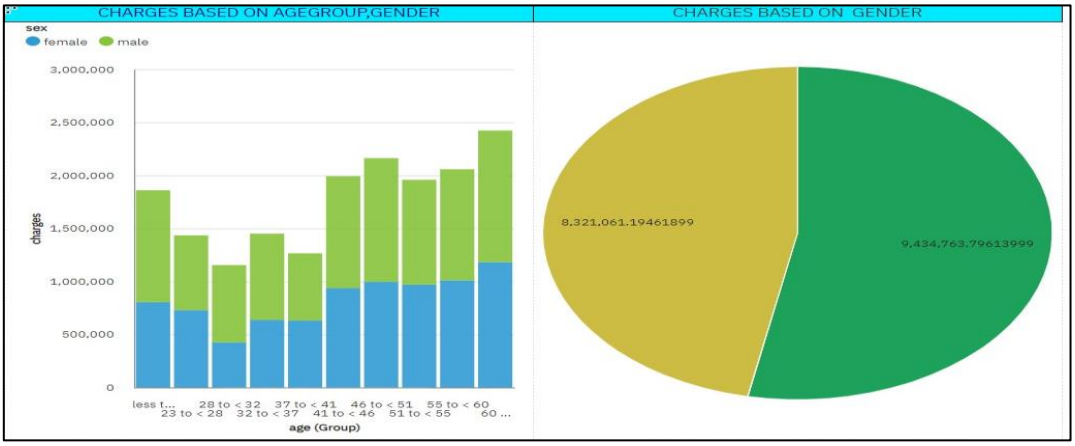


Fig 4.19 Report page 2

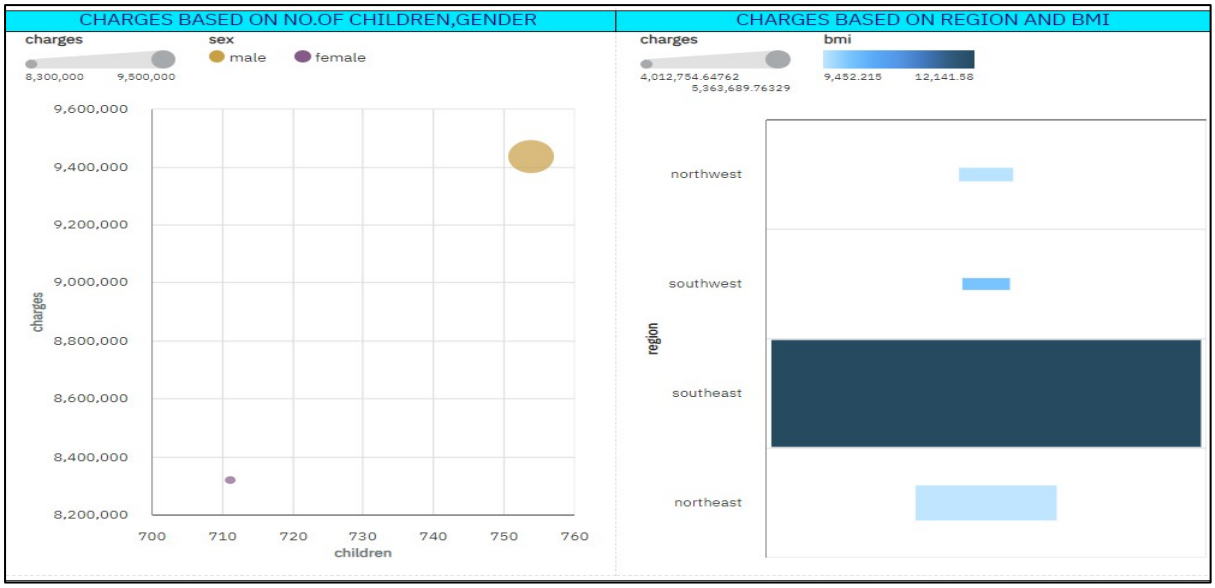


Fig 4.20 Report page 2

Fig 4.21 Story scene 1

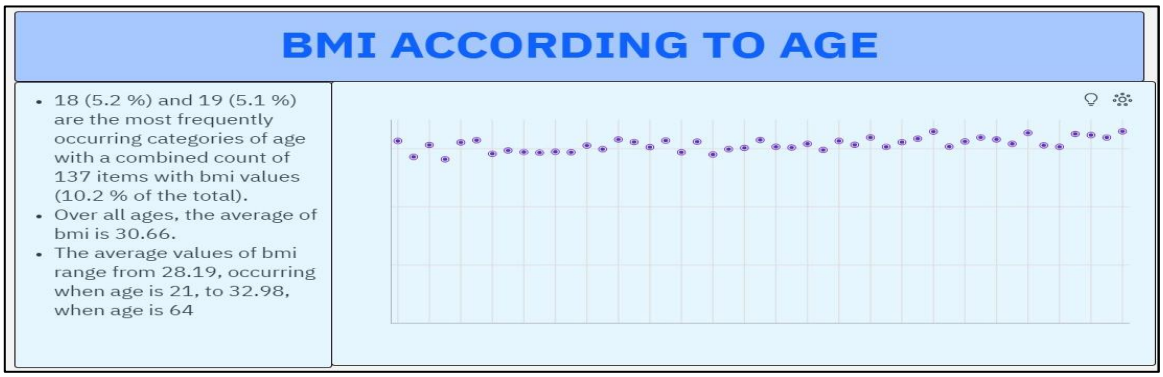


Fig 4.22 Story scene 2

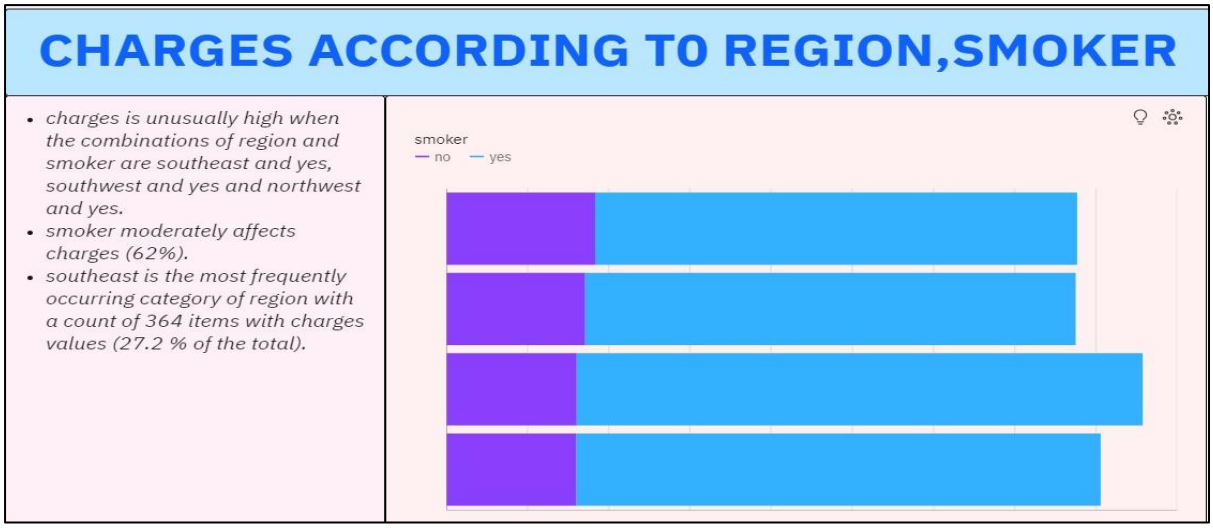


Fig 4.23 story scene3

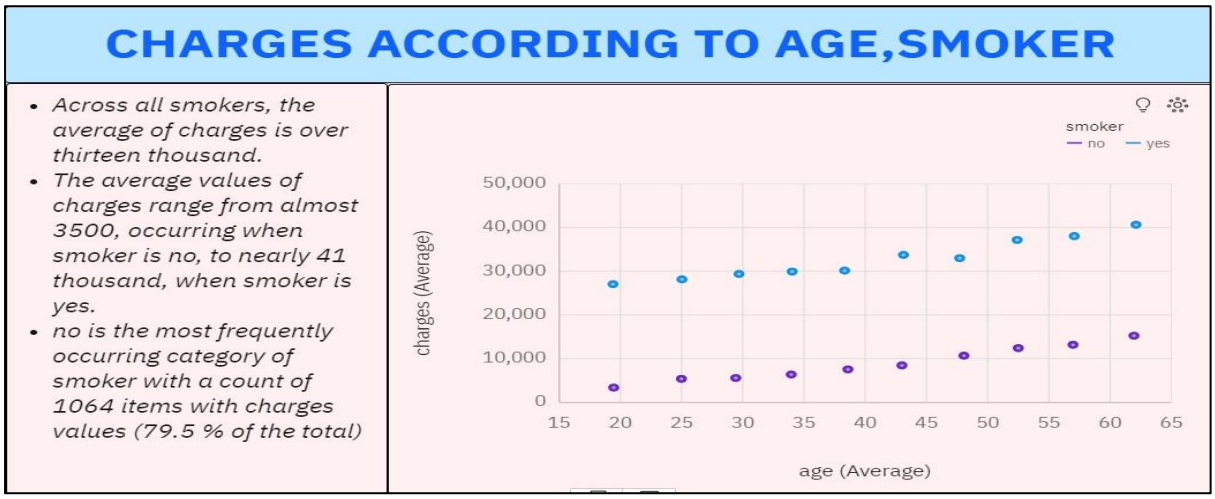


Fig 4.24 Story scene4

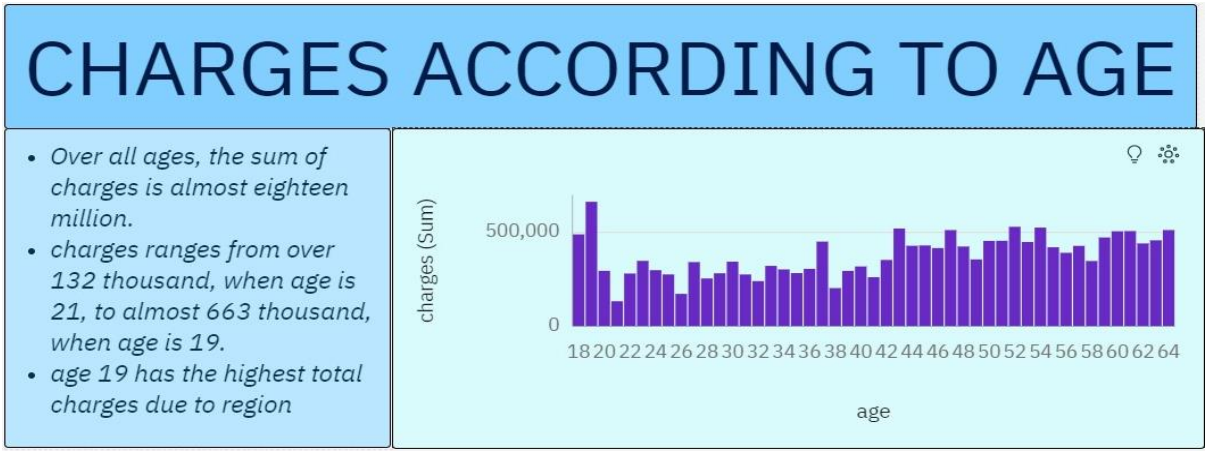


Fig 4.25 Story scene5

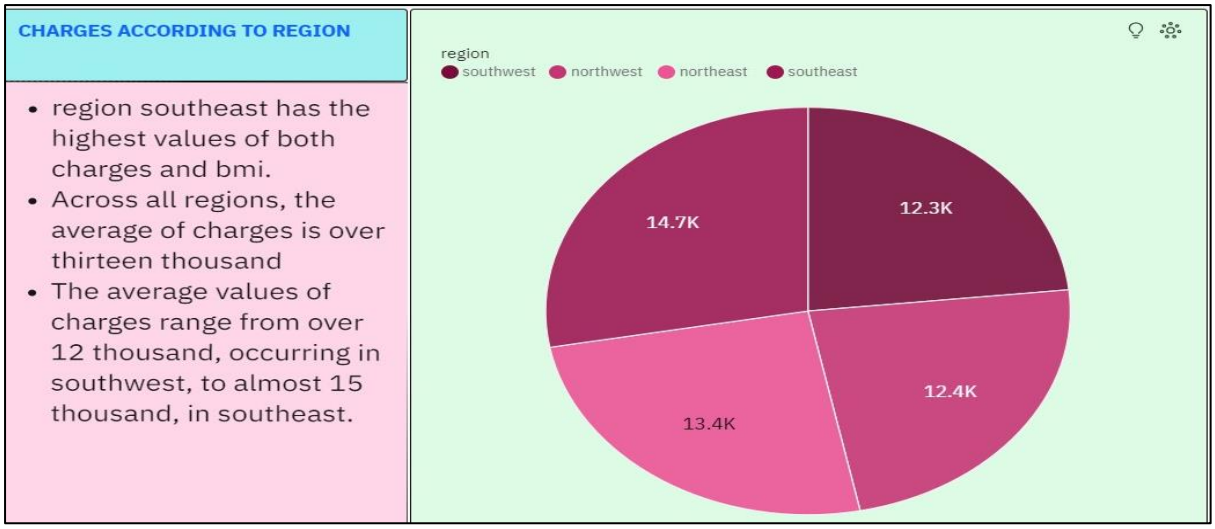


Fig 4.24 Story scene6

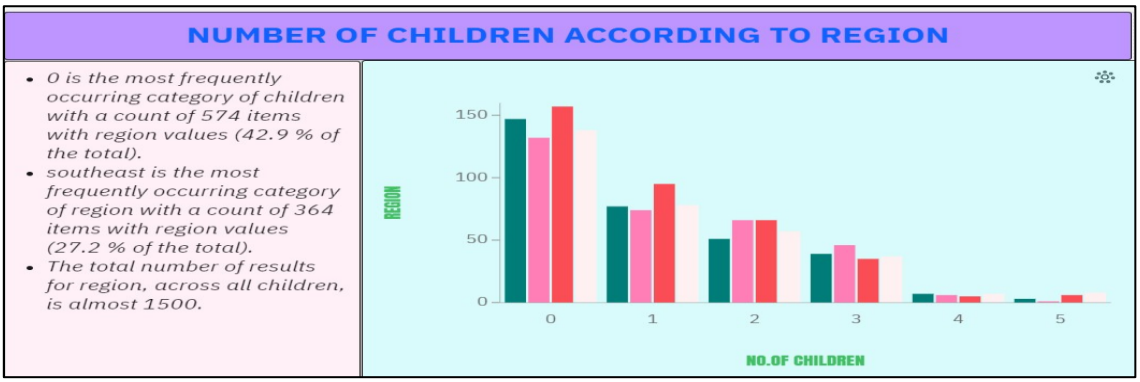


Fig 4.25 Story scene7

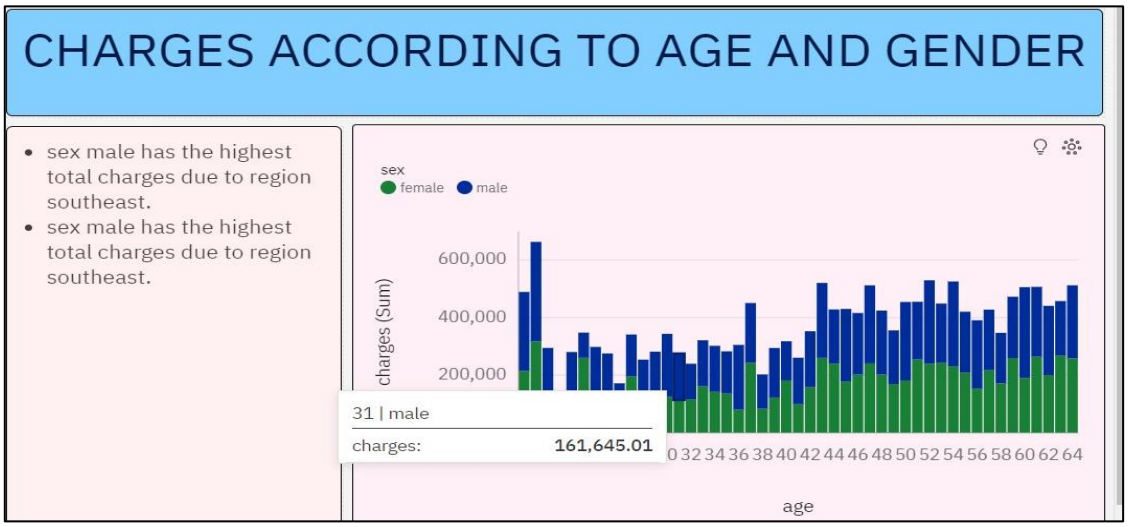


Fig 4.26 Story scene8

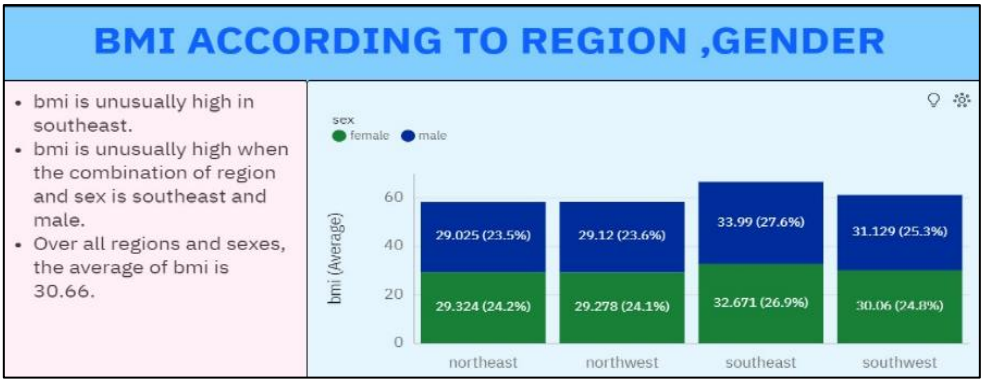


Fig 4.27 Story scene9

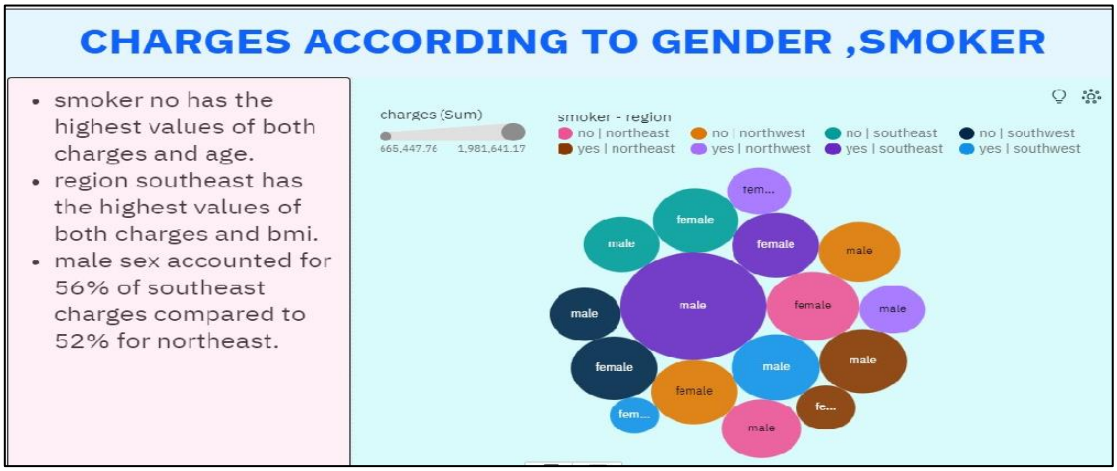


Fig 4.28 Story scene10

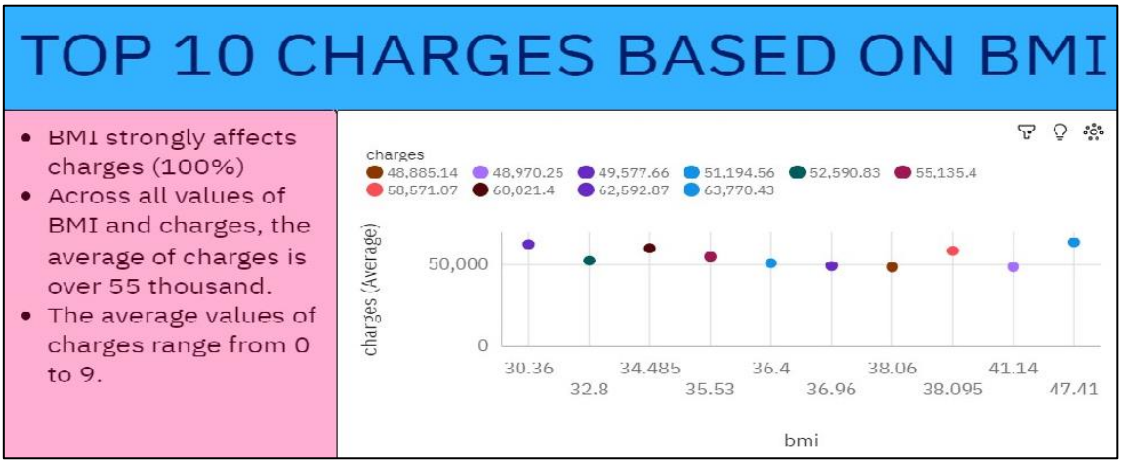


Fig 4.29 Story scene11

Fig 4.30 story scene12

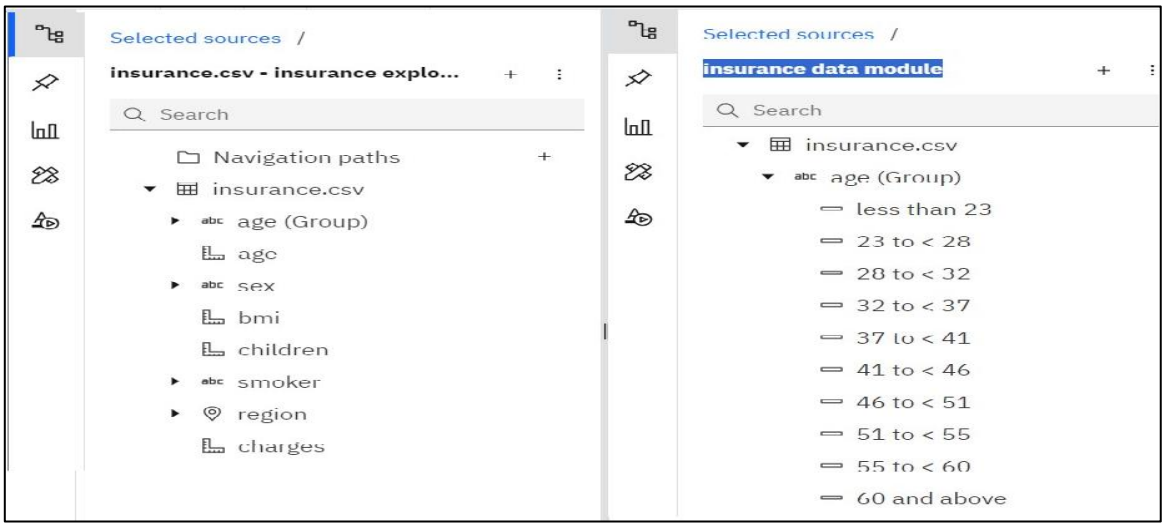


Fig 4.31 Actual fields and new calculation field age(group) added

Fig 4.32 Filters used

Fig 4.33 Web integration

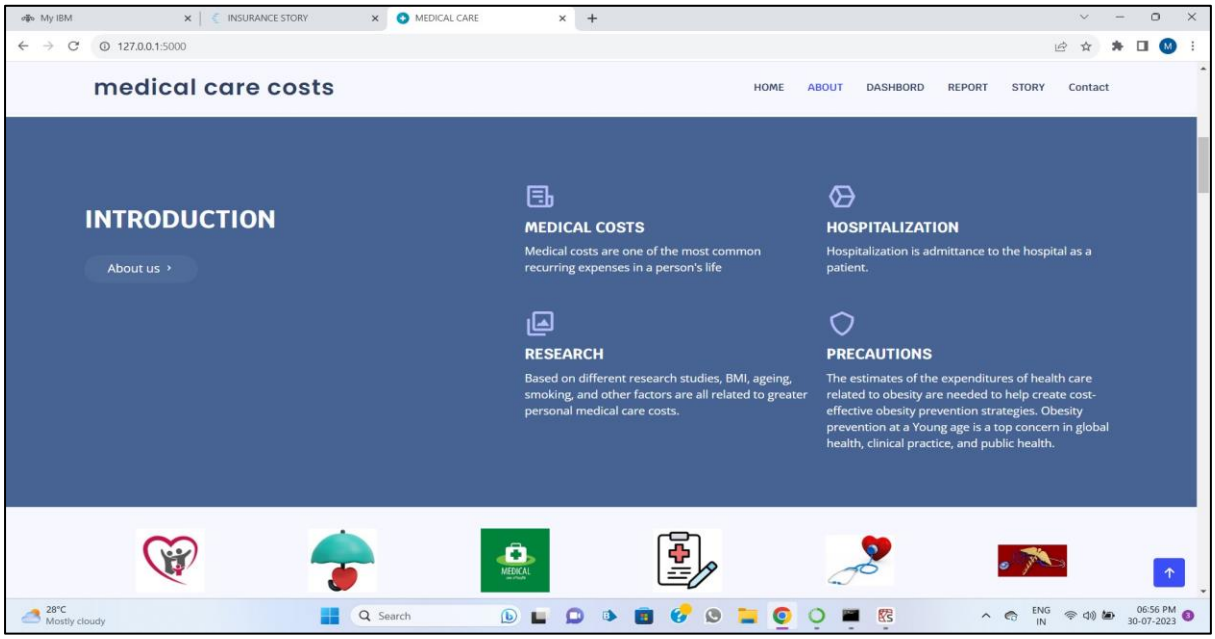


Fig 4.34 Web integration

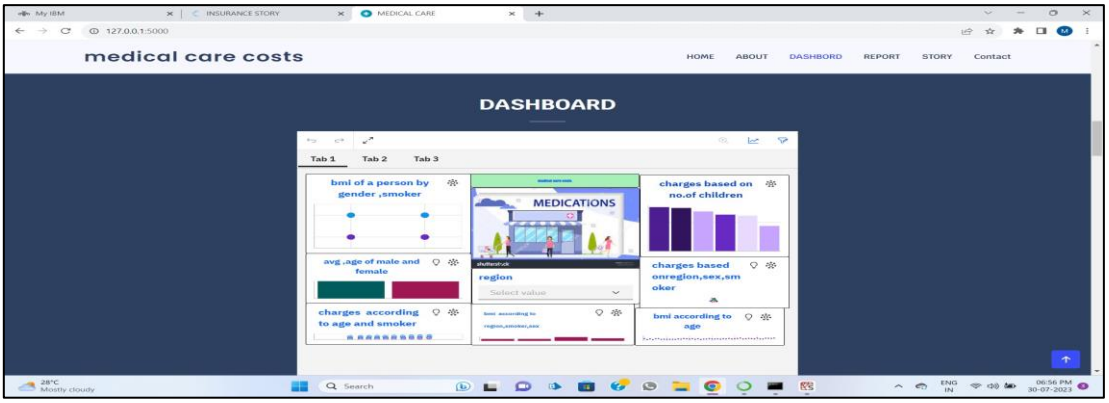


Fig 4.35 Web integration

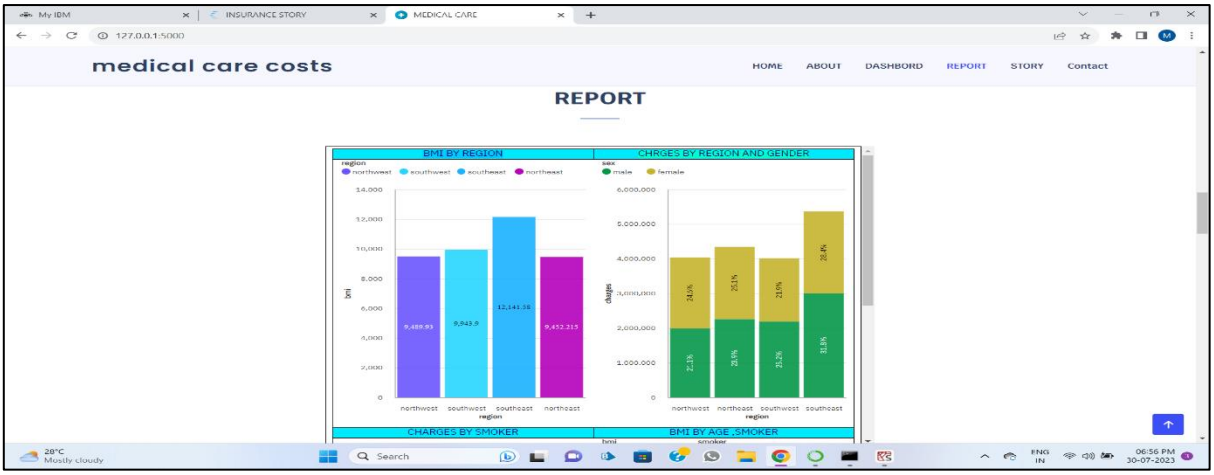


Fig 4.36 Web integration

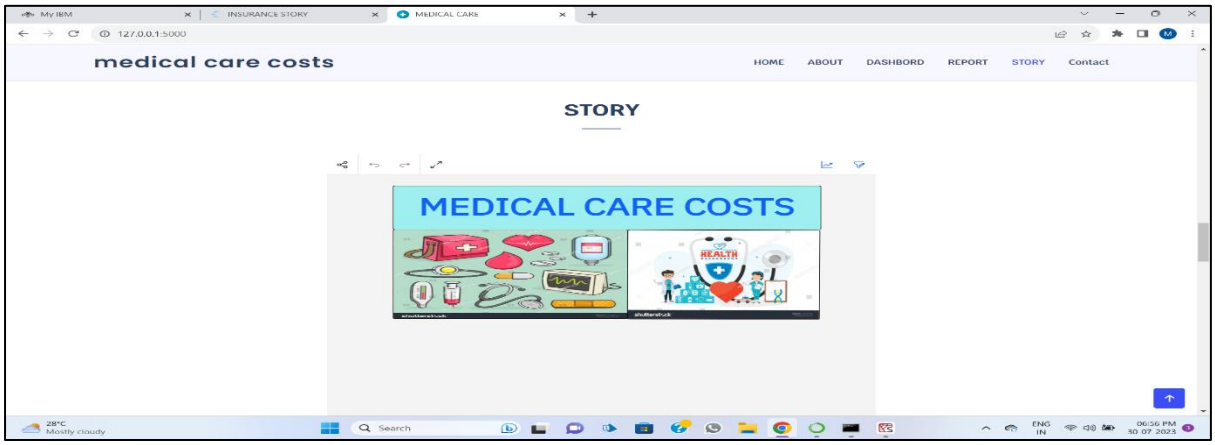


Fig 4.37 Web integration

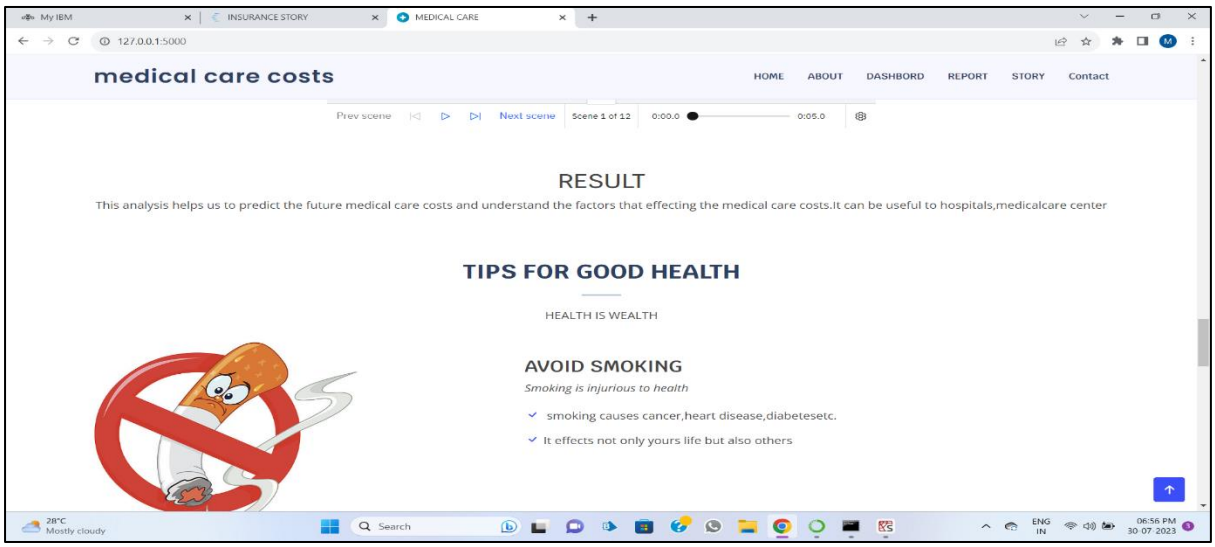
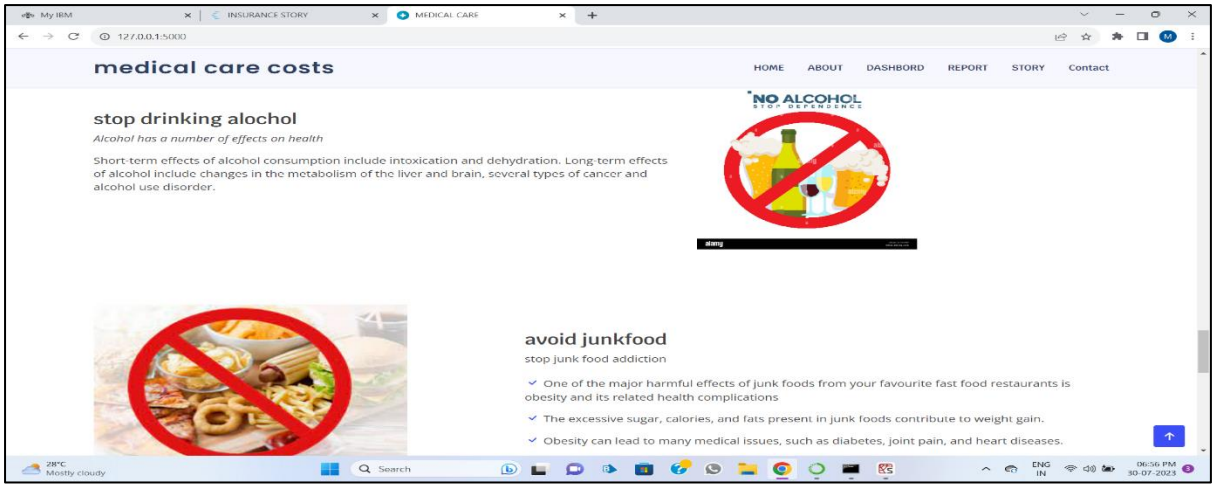


Fig 4.38 Web integration



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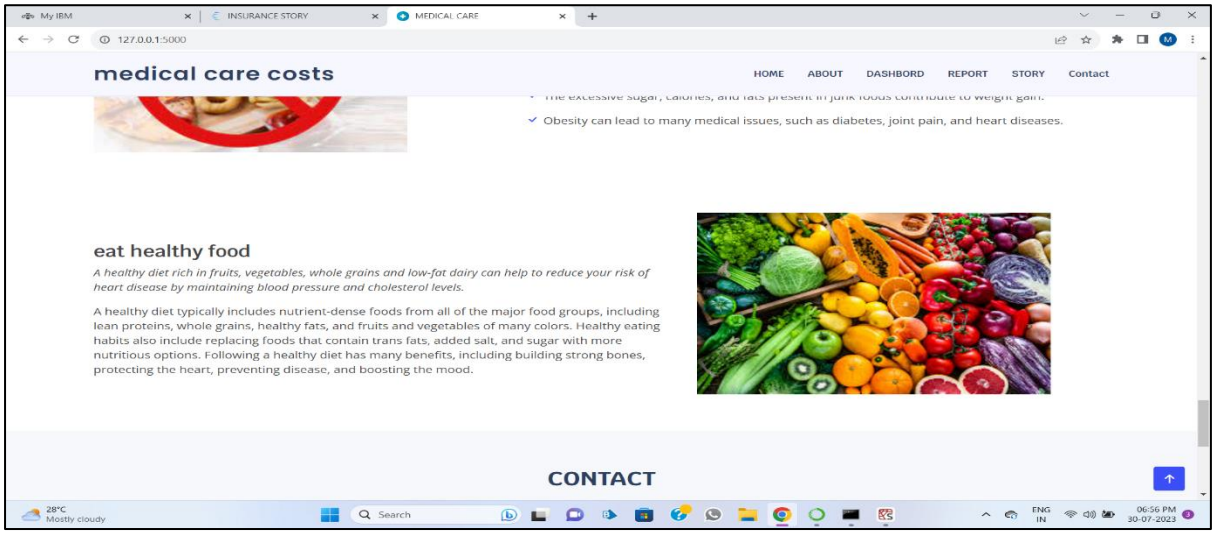

Fig 4.40 Web integration

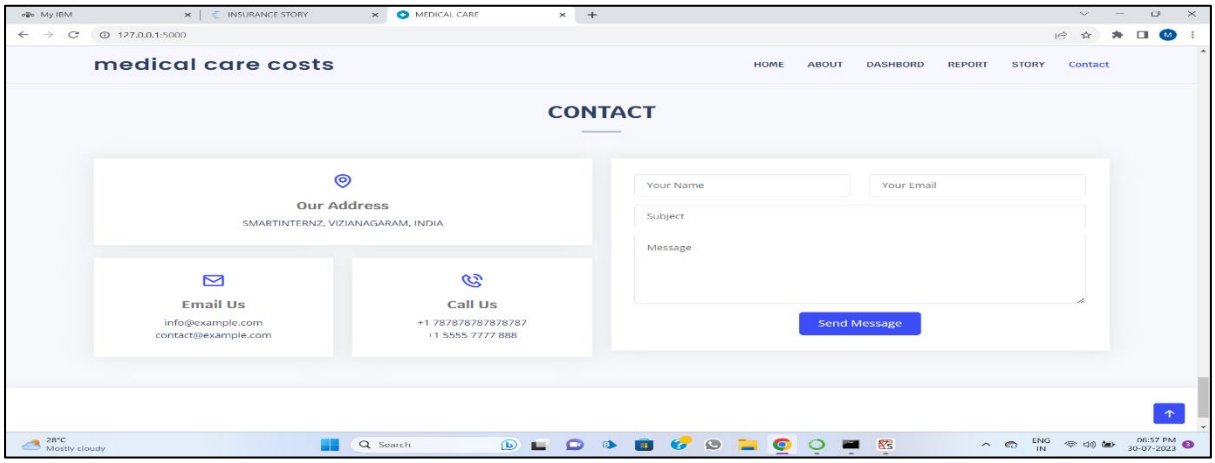

Fig 4.41 Web integration

PROJECT DEMO LINK:

https://drive.google.com/file/d/1SsxXWwzVSV03ioANGFD5p8u7hoYbudSf/view?usp=drive_link

4.ADVANTAGES AND DISADVANTAGES:

Advantages:

- This analysis helps us to enhance overall healthcare provision, improve patient care.
- Understand and interpret large amounts of data so that decision making becomes easy
- Helps to detect fraud and errors within healthcare organizations
- It can helps in medical research and policy development
- More accurate health insurance rates
- Accelerated performance
- Minimized overall costs

Disadvantages:

- Sometimes estimations are not accurate
- Improper visualizations may lead to improper conclusions
- Lack of assistance
- Improper design issue
- Model complexity

6.APPLICATIONS:

This project can have several applications in healthcare industry and beyond.

- Healthcare cost management
- Financial planning
- To start cost-effective health care programs
- Finding factors effecting health and rectify them
- Treatment decision support
- Long term cost control
- Insurance pricing and coverage
- Research and public health

7.CONCLUSION:

This analysis helps to find patterns and estimate the medical care costs. In this the created visualizations give information about which factors effecting healthcare costs and how much they effecting it. This can be used in health care industry and insurance companies to understand the complex data by visualization.

Here we used exploratory data analysis to convert complex data set into simple visualisations so that the data can be easily understand and understand the patterns of how medical care costs increases. In this project we observe that smoking, BMI increases medical charges. This solution can easily demonstrate the reasons for producing healthcare expenses, which is a useful capacity in the healthcare area.

Dashboard creation useful for monitoring, measuring, and analysing relevant data in key areas. A storyboard is a visual representation of the data analysis process and it breaks down the analysis into a series of steps or scenes. The story creation helps to understand insights in better way. Report creation helps users to better understand their data and make informed decisions.

Web integration helps to track and monitor key performance metrics, to communicate results and progress. help a publisher stay informed, make better decisions, and communicate their performance to others. Here we are using python, spyder for editing html code as they are ease and efficient.

8.FUTURE SCOPE:

There is scope for future development of this project. The world of computer is not static, it is always subjected to be dynamic. The technology which is famous for today becomes outdated the very next day. To keep abstract of technical improvements, the system (project) may be further refined so, it is not concluded. Yet will improve with future enhancements.

Enhancements done with efficient manner which includes real-time data visualizations which allows users to see data as it is being generator, providing instant insights and enabling quick decision-making. For effective train and test the dataset we can feed this analysed data to machine learning algorithms so that the accuracy of the model is detected. The same things of this project will be updated with further modification establishments and can be integrated with minimal modification. Thus the project is flexible and can be enhanced at anytime with more advanced features.