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# Project Report On

# Estimation and Prediction of Hospitalization and Medical Care Costs


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# Project Report Format

1. **INTRODUCTION**

1.1 Overview

A brief description of your project.

1.2 Purpose

The use of this project. What can be achieved using this.

2. **LITERATURE SURVEY**

2.1 Existing problem

Existing approaches or methods to solve this problem.

2.2 Proposed solution

What is the method or solution suggested by you?

3. **THEORETICAL ANALYSIS**

3.1 Block diagram

Diagrammatic overview of the project.

3.2 Hardware / Software Designing

Hardware and software requirements of the project.

4 . **RESULT**

Final findings (Output) of the project along with screenshots.

5. **ADVANTAGES & DISADVANTAGES**

List of advantages and disadvantages of the proposed solution.

6. **APPLICATIONS**

The areas where this solution can be applied.

7 . **CONCLUSION**

Conclusion summarizing the entire work and findings.

8. **FUTURE SCOPE**

Enhancements that can be made in the future.

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# 1. Introduction

## 1.1 Overview

Medical care costs account for nearly 18% of Gross Domestic Product (GDP) and 20% of government spending. As a country, we know a lot about where the medical dollar goes. Thirty-eight percent of medical care dollars are paid to hospitals, 31% is paid for professional services, 12% is for outpatient pharmaceuticals, and so forth. But this is not really what we value. The goal of medical care is not to poke, prod, or take pictures of our insides; rather, it is to improve our well-being. To understand health care, we need to determine what it is doing for our health.

Health accounting is not easy. Academics and statistical agencies have struggled with it for decades. Questions range from the mundane – how do colonoscopy prices vary across payers? – to the fundamental – to what extent is medical care improving the population's health? With this much uncertainty about the value of medical care, it is incumbent on public and private researchers alike to regularly survey the landscape.

Among adults (age 15+), 28.6% of the population currently uses tobacco products (men 42.4%; women 14.2%). Among youth (ages 13–15): 8.5% currently use some form of tobacco (boys 9.6%; girls 7.4%); and. 4.1% smoke tobacco and 4.1% use smokeless tobacco. Prevalence. There are approximately 120 million smokers in India. Around 267 million individuals (aged 15 and above) in India, accounting for 29% of all adults, were reported as tobacco consumers based on the Global Adult Tobacco Survey India conducted during 2016-17.

## 1.2 Purpose

Hospital Costing is the accounting function that ascertains the costs of providing medical service in a hospital, by the department, and in the entire hospital, and allows hospital management to make financial decisions and be in control of budgets, on top of providing valuable information for pricing purposes. In India alone, nearly 1 in 10 adolescents in the age group 13-15 yr have ever smoked cigarettes, and almost half of these reports initiated tobacco use before 10 yr of age.

I successfully analyzed insurance data and expertly categorized it into two groups: hospitalization and medical costs, as well as smokers versus non-smokers by region and gender. The results of my analysis were used to create an extensive dashboard story report, which I seamlessly integrated. My efforts led to valuable insights into medical care expenses and smoking rates in India. I am proud to say that my team and I are extremely satisfied with the outcome of our hard work.

We have created a web page that provides valuable information about hospitalization and medical cost predictions. On this page, we have detailed all the aspects of our project. We hope that this will be of great help to you. My team and I have been working relentlessly to accomplish our project objective. The results are expected to be phenomenal, and I can share further details via the attached documentation.

# 2. LITERATURE SURVEY

## 2.1 Existing problem

The Indian healthcare scenario presents a spectrum of contrasting landscapes. At one end of the spectrum are the glitzy steel and glass structures delivering high-tech Medicare to the well-heeled, mostly urban Indian. At the other end are the ramshackle outposts in the remote reaches of the “other India” trying desperately to live up to their identity as health subcenters, waiting to be transformed into shrines of health and wellness, a story which we will wait to see unfold. With the rapid pace of change currently being witnessed, this spectrum is likely to widen further, presenting even more complexity in the future.

The benefits of quitting tobacco are almost immediate. After just 20 minutes of quitting smoking, your heart rate improves. Within 1-9 months, coughing and shortness of breath decrease. Within 5-15 years, your stroke risk is reduced to that of a non-smoker. Within 10 years, your lung cancer death rate is about half that of a smoker. Within 15 years, your risk of heart disease is that of a non-smoker. Ask your provider if there is a less expensive medicine that treats the same condition. The existing problems of medical care, particularly the rising costs, have been a major concern for individuals and governments alike.

The escalating medical care costs have made it increasingly difficult for people to afford necessary healthcare services and treatments. One of the primary issues contributing to these high costs is the complex and fragmented healthcare system. The lack of coordination between different healthcare providers, insurance companies, and pharmaceutical companies often leads to inefficiencies and inflated prices. Moreover, the progress in medical technology and treatments has led to increased costs for patients and healthcare providers alike.

## 2.2 Proposed solution

The issue of smoking and its impact on both smokers and non-smokers has far-reaching consequences, particularly in terms of medical care costs. Smokers often face a myriad of health problems, ranging from respiratory issues to cardiovascular diseases, leading to increased medical expenses. Moreover, non-smokers who are exposed to secondhand smoke can also experience negative health effects.

The primary objective of this project is to conduct a thorough analysis of the distinguishing features between smokers and non-smokers, along with the corresponding healthcare expenses in India. Our study will specifically categorize the data by gender (men, women, children, and elderly) and BMI, and we will employ graphs and storyboards to present the analyzed data clearly and concisely.

We confidently employ four highly effective methods to estimate and predict hospitalization and medical care costs, which include developing a dashboard, crafting a compelling story, preparing a comprehensive report, and integrating with the web. Our team's diligent efforts and unwavering commitment culminate in the creation of an informative web page that offers a clear and concise explanation of the intricacies of hospitalization and medical care cost estimation and prediction. We also utilize a sophisticated data module to accurately identify smokers and non-smokers in India based on various regions and genders. The existing problems of medical care, particularly the rising costs, have been a major concern for individuals and governments alike. The escalating medical care costs have made it increasingly difficult for people to afford necessary healthcare services and treatments.

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# 3. THEORETICAL ANALYSIS

## 3.1 Block diagram


## 3.2 Hardware / Software Designing

Hardware Requirements:- 1. Server
2. Computer or Laptop

Software Requirements:- 1. IBM Cognos
2. Python
3. Anaconda Navigator
4. Jupiter Notebook
5. Spyder
6. Web Browser

# 4. RESULT

For our project's Estimations and Predictions of Hospitalization Medical Care Costs, we are analyzing the Insurance CSV Dataset provided. This dataset includes information on Age Groups, Genders, BMI, Children, Smoking status, Non-Smoking status, Region, and Charges.

1. First is the Average age of Males and Females. This is the bar chart graph plotting the Average age of men 39.5 and female 38.92.
2. Next is the BMI of a Person based on their age. This is a bubble chart it creates BMI averages and averages of ages.
3. Moving forward to The Average Number of Children by Age and Smoker or Not. This is the Stacked bar chart which shows the average age of smokers and their ages.
4. Then there is an Average Age of People According to Their Region and Gender. This is a stacked column that shows the Average age of genders in different regions.
5. Then there is a plotted chart which shows Charges Paid by People According to Their Age and Smoker.
6. Moving Forward to a circular chart That shows the BMI of a Person by Gender and Smoker.
7. Then there is a Bubble chart it shows the Charges paid by people According to their Gender, Region, and Smoker
8. Now a Staked bar chart shows the Average BMI of people by Gender and Region.
9. Top 100 Charges Paid by People Based on BMI and Colored by Region which shows in the bubble chart.
10. Now The number of Children the people by region shows the performance in the bar chart.
11. Charges paid by the People by region analyze the data in the stacked column.
12. Lastly, the bar graph shows the charges based on the Number of Children.

I am delighted to inform you that 12 distinct charts have been produced utilizing the insurance data module. Despite initial setbacks, we persisted and now possess an array of visuals that can aid us in comprehending the data more effectively.

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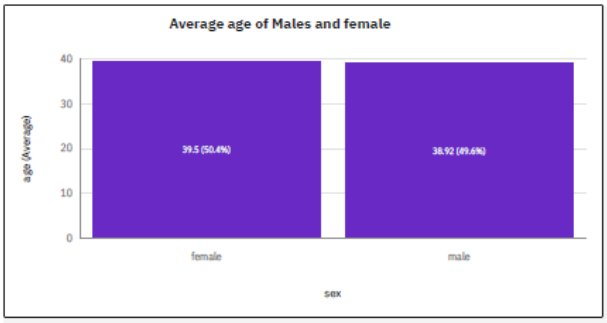
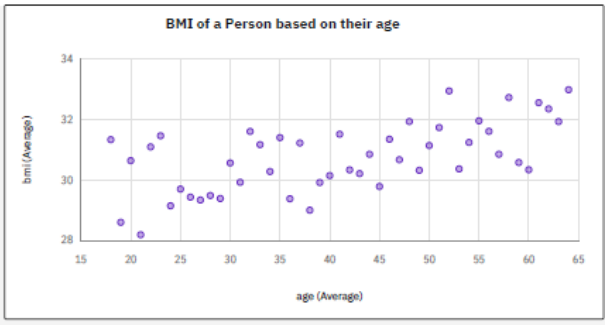
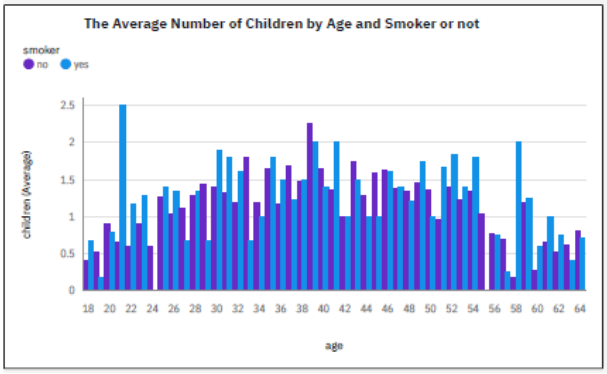
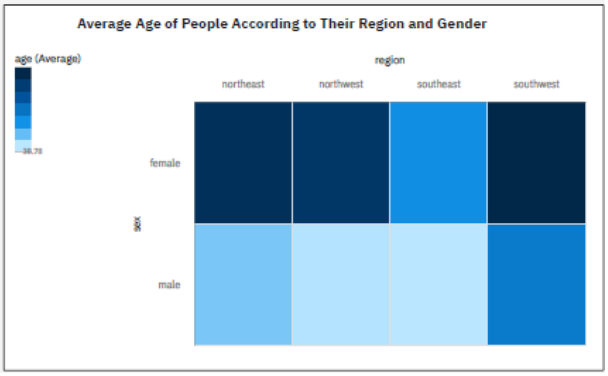
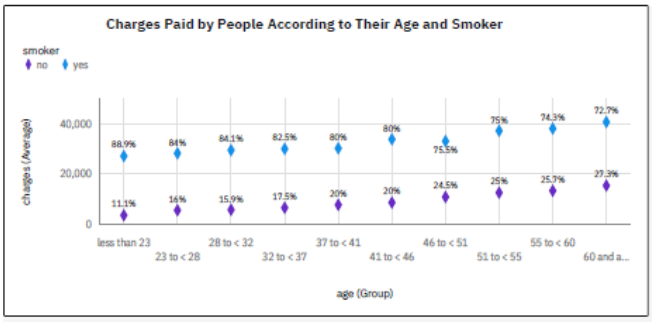
# OUTPUTS:

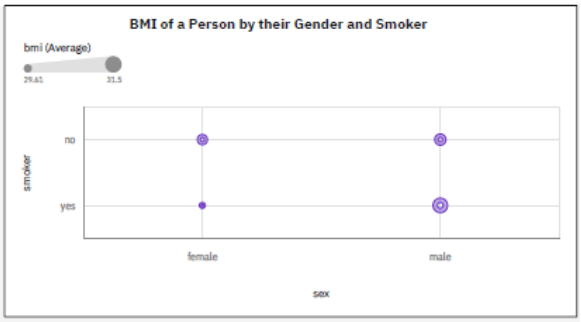


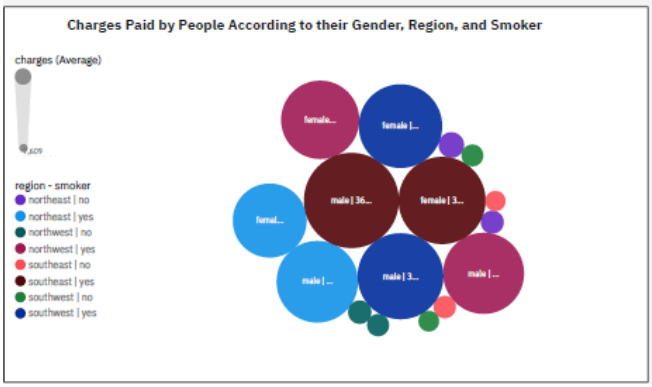



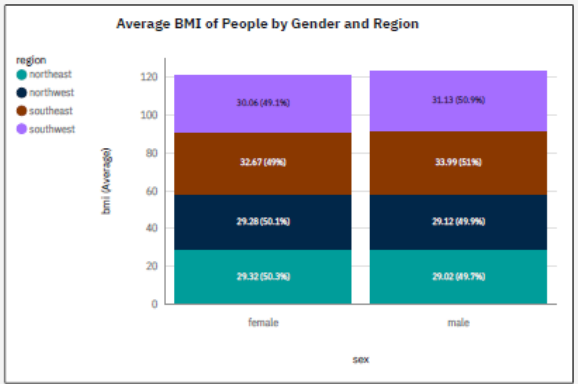



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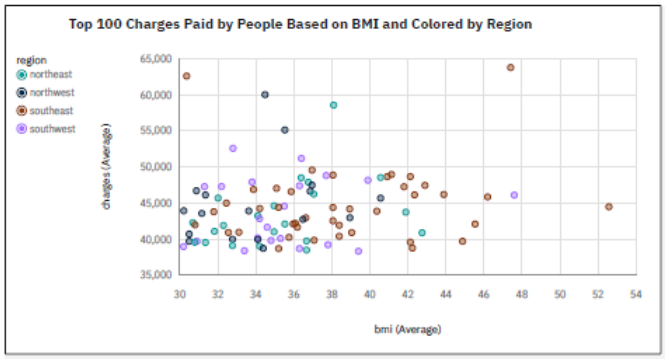


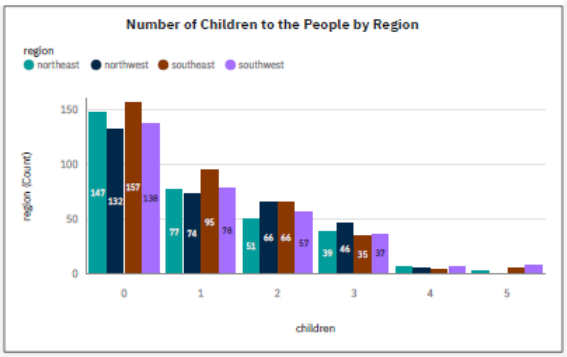


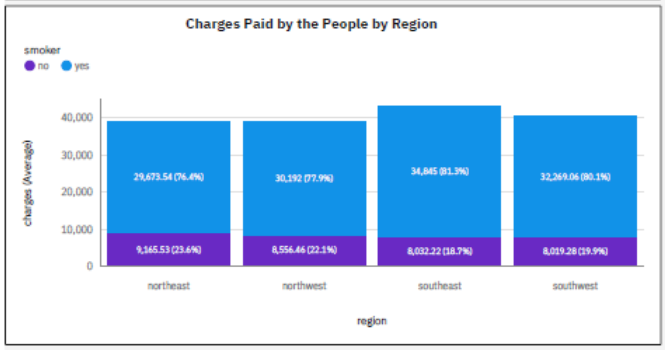


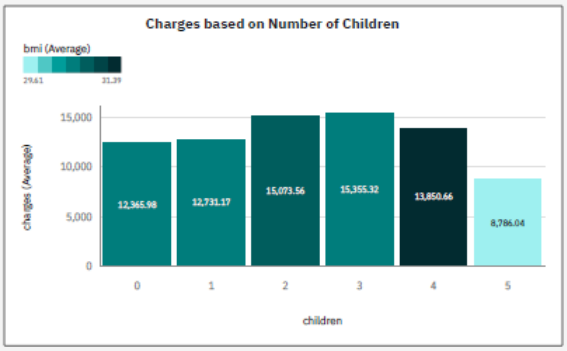


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  - sex
    - female
    - male
  - bmi
  - children
  - smoker
  - region
  - charges

- Navigation paths
- insurance.csv
  - age (Group)
  - age
  - sex
  - bmi
  - children
  - smoker
  - region
  - charges

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# 5. ADVANTAGES & DISADVANTAGES

The potential advantages of the proposed solution are:

1. Predicting medical costs is essential for healthcare planning and financial management. By analyzing historical data and using advanced algorithms, providers can forecast expenses for treatments, procedures, medications, and other services.
2. Accurate medical cost estimates help healthcare organizations allocate resources effectively and plan for financial implications, avoiding potential strain.
3. Understanding medical care expenses helps policymakers create cost-effective healthcare policies without compromising the quality of care.
4. Smokers have higher healthcare expenses due to their increased risk of developing health problems like lung cancer, cardiovascular diseases, and respiratory disorders.
5. Comparing the costs associated with smoking can be beneficial in making informed decisions regarding policy and insurance.
6. Data-driven medical cost predictions improve healthcare planning and decision-making.

DISADVANTAGES:

While the proposed solution has several advantages, it is important to consider the potential disadvantages:

1. Estimations and predictions for medical costs can help with planning healthcare expenses but relying solely on them has drawbacks.
2. Future medical expenses are uncertain, making financial planning difficult and potentially leading to unexpected costs.
3. Healthcare cost estimations may not accurately reflect individual needs due to unique health conditions, resulting in overestimations or underestimations.
4. Healthcare costs can vary due to factors like location, facility type, and insurance coverage. Average costs may not be an accurate reflection of actual costs.
5. Smoking is linked to health risks and higher medical costs, especially for diseases like lung cancer and heart disease. Non-smokers generally have lower healthcare expenses.
6. Healthcare costs are unpredictable. Having comprehensive insurance coverage based on individual needs is better than relying on estimates.

# 6. APPLICATIONS

The process of analyzing data and trends is of utmost importance when it comes to predicting medical expenses, particularly for individuals who are smokers. This is due to the fact that smokers often require more extensive care as they are prone to various health issues caused by smoking. By making use of this valuable information, healthcare providers and policymakers can develop targeted interventions that are tailored to the specific needs of this group. This, in turn, facilitates the effective allocation of resources and helps to reduce smoking rates. Additionally, these estimations offer invaluable insights into the financial impact of smoking-related illnesses, which is essential for the proper allocation of resources within the healthcare system.

Analyzing data and trends is crucial for predicting medical expenses for smokers, who often require extensive care due to smoking-related health issues. This information can help healthcare providers and policymakers develop targeted interventions, allocate resources effectively, and better prepare for the financial burden of smoking-related illnesses. Utilizing this information leads to better outcomes for individuals and the healthcare system.

# 7. CONCLUSION

In conclusion, estimations and predictions regarding hospitalization and medical care costs for smokers and non-smokers have shown significant differences. It is widely acknowledged that smokers tend to incur higher medical expenses compared to non-smokers due to the increased risk of developing various health conditions associated with smoking. Smoking is strongly linked to illnesses like heart disease, respiratory issues, and cancer. These can require significant medical treatment. The financial cost of healthcare for smokers can be significant. They not only bear the expense of their own medical needs but also contribute to the overall healthcare expenditure of society.

Non-smokers typically have lower healthcare expenses and may be eligible for more affordable insurance premiums and medical treatment costs. Quitting smoking can lead to significant savings on medical care expenses in the long run, making it an important decision for both current and potential smokers to consider. Thus, it is crucial for current and potential smokers to consider this option seriously.

# 8. FUTURE SCOPE

The future scope of hospitalization and medical care costs is an important topic to consider, especially when examining the differences between smokers and non-smokers. Medical care costs have been steadily rising over the years, and it is crucial to understand how certain factors, such as smoking habits, can impact these costs. Smoking causes respiratory diseases, heart diseases, and cancer, resulting in higher healthcare costs for smokers. In the future, as healthcare systems continue to evolve and adapt to changing demographics and advancements in medical technology, it is likely that medical care costs will continue to rise. This increase can be attributed to factors such as inflation, increased demand for healthcare services due to an aging population, and the development of new treatments and therapies.

It's important to note that smoking can cause chronic health issues and weaken the immune system, which can ultimately lead to higher medical costs for smokers down the road. Not smoking lowers healthcare expenses and reduces the risk of costly health conditions associated with smoking. Effective tobacco control measures can improve public health and reduce the financial burden of smoking-related illnesses. Policymakers and healthcare providers should take note of these trends when planning future healthcare systems.

In conclusion, understanding the future scope of hospitalization and medical care costs in relation to smokers versus non-smokers highlights the need for preventive measures against tobacco use. By promoting healthier lifestyles and providing support for those looking to quit smoking or prevent initiation altogether, we can potentially reduce both the personal and societal costs associated with smoking-related illnesses.