PREDICTIVE MODEL OF STUDENT'S SUCCESS & CAREER COUNSELING USING DATA SCIENCE

By

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Report submitted for the

Degree of MS (Data Science)

National University of Computer & Emerging Sciences

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PATEL HOSPITAL PATIENTS EXPLORATORY DATA ANALYSIS USING DATA SCIENCE

MS Course Project

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1. Introduction

Data Science is the area of study which involves extracting insights from vast amounts of data by the use of various scientific methods, algorithms, and processes. It helps you to discover hidden patterns from the raw data.

The term Data Science has emerged because of the evolution of mathematical statistics, data analysis, and big data.

Data Science is an interdisciplinary field that allows you to extract knowledge from structured or unstructured data. Data science enables you to translate a business problem into a research project and then translate it back into a practical solution. Key components of data science are given in figure 1.

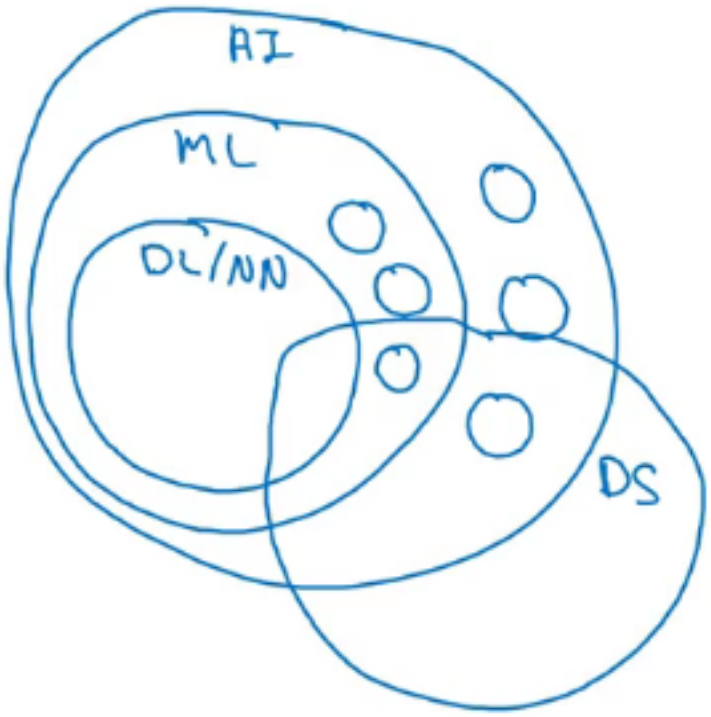


Figure1. Key Components of Data Science

Data Science Process

Data science process is consists of six key modules — discovery, data preparation, model planning, model building, operation and communicate results. These processes are given in figure 2.

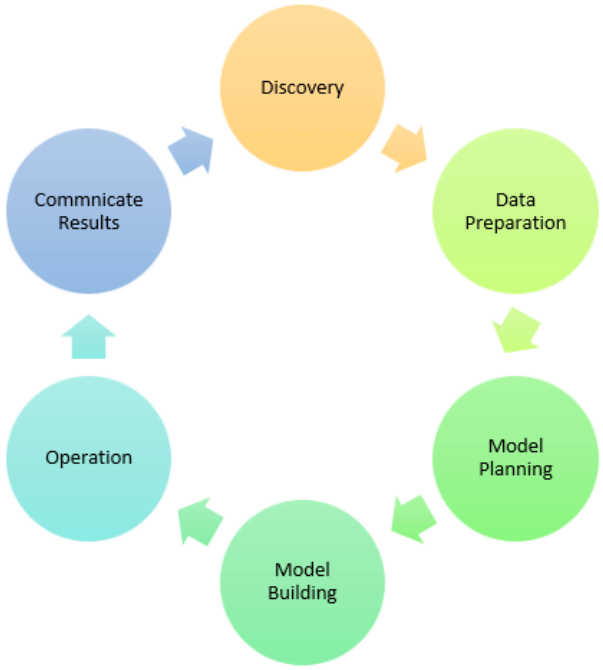


Figure2. Data Science Processes Model

i. Discovery

Discovery step involves acquiring data from all the identified internal & external sources which helps you to answer the business question.

The data can be:

- Provided by Patel Hospital

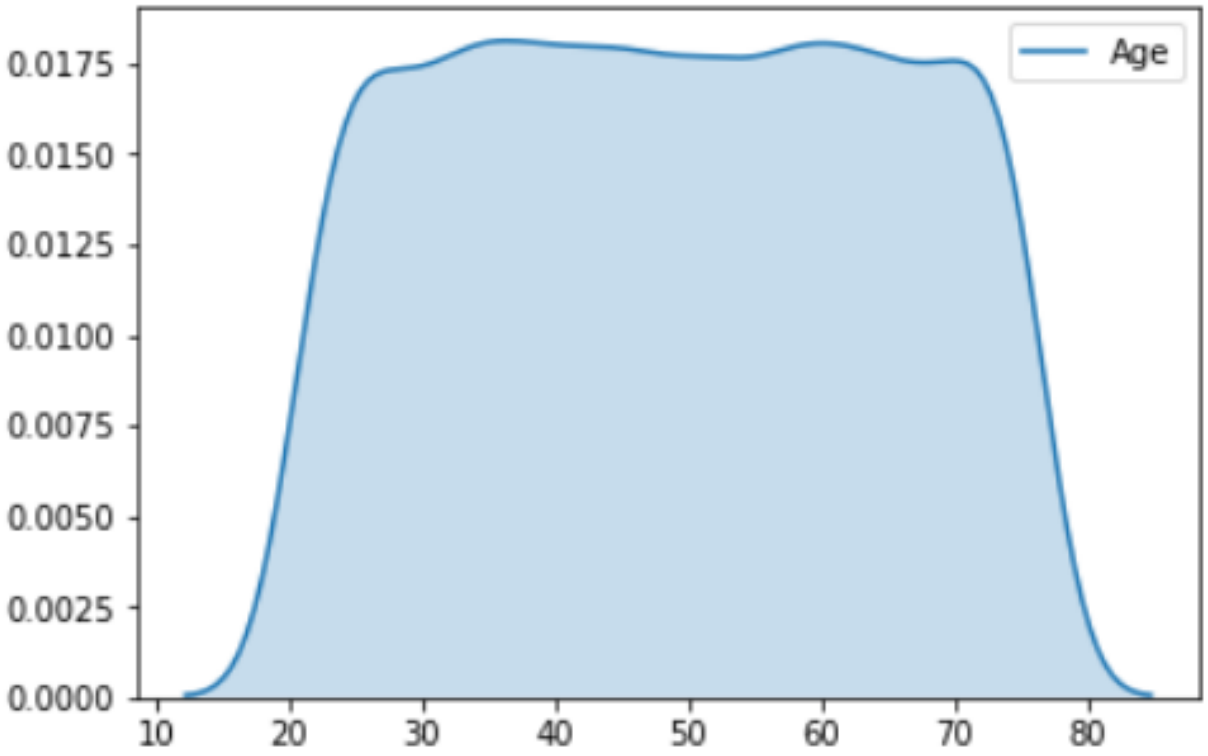
ii. Exploratory Analysis

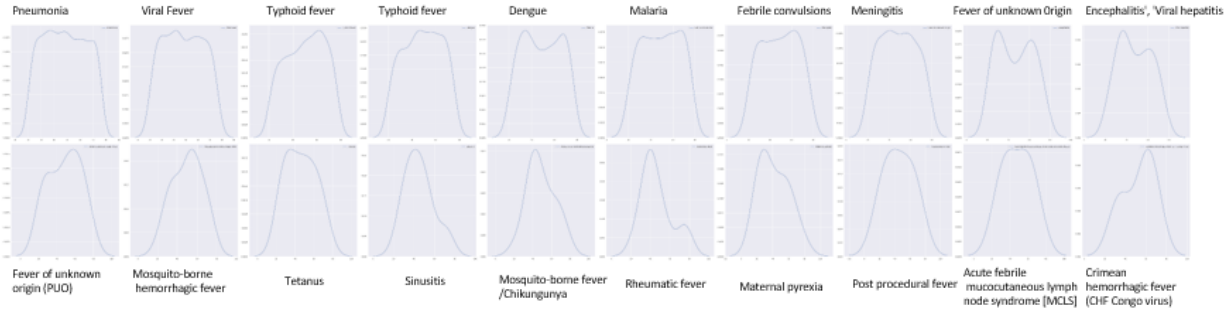
We have displayed best graph using matplot and seaborn visualization tools in python. We found some trends during Analysis. Now we can see each analysis on by one.

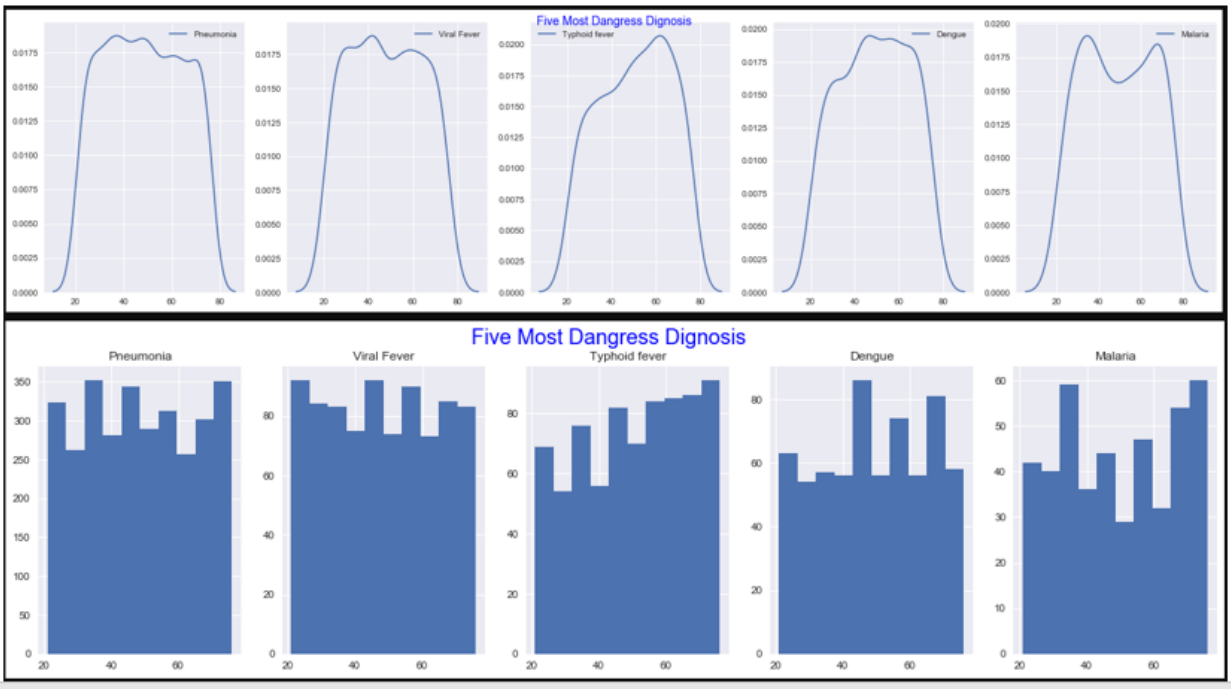
2.1 Age vs Disease

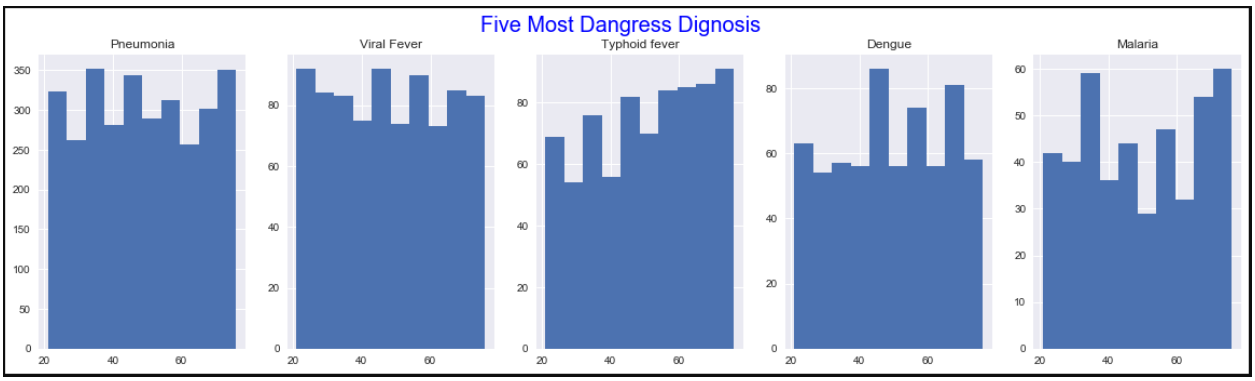
Patients age starting from 12 to 90

25 to 75 look like uniform distribution




Pneumonia
Viral Fever
Typhoid fever
Typhoid fever
Dengue
Malaria
Febrile convulsions
Meningitis
Fever of unknown Origin
Encephalitis', 'Viral hepatitis
Fever of unknown origin (PUO)
Mosquito-borne hemorrhagic fever
Tetanus
Sinusitis
Mosquito-borne fever /Chikungunya
Rheumatic fever
Maternal pyrexia
Post procedural fever
Acute febrile mucocutaneous lymph node syndrome [MCLS]
Crimean hemorrhagic fever (CHF Congo virus)

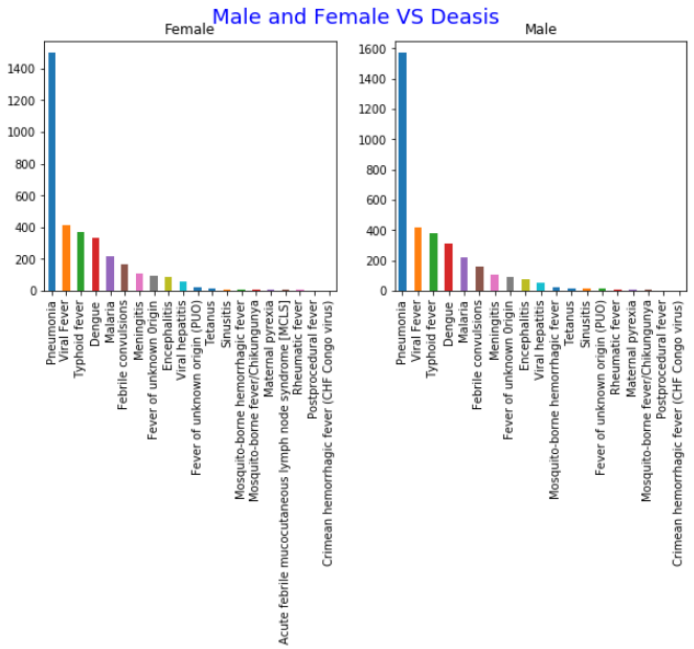

Five Most Dangress Dignosis
Pneumonia
Viral Fever
Typhoid fever
Dengue
Malaria



- Phenomena mots effected patients
    - 25 to 55 oldest people
    - 65 to 70 oldest people
- Viral Fever most effected patients
    - 20 to 38 or 50 to 55 oldest people
- Typhoid most effected patients
    - 55 to 60 oldest people oldest people

2.2 Gender vs Disease

- Most Common disease in males (3,480)
    - Pneumonia (1,572)
    - Viral Fever (418)
    - Typhoid Fever (381)
- Most Common disease in Females (3,427)
    - Pneumonia (1500)
    - Viral Fever (413)
    - Typhoid Fever (372)



Most Common disease in males (3,480)

Pneumonia (1,572)

Viral Fever (418)

Typhoid Fever (381)

Most Common disease in Females (3,427)

Pneumonia (1500)

Viral Fever (413)

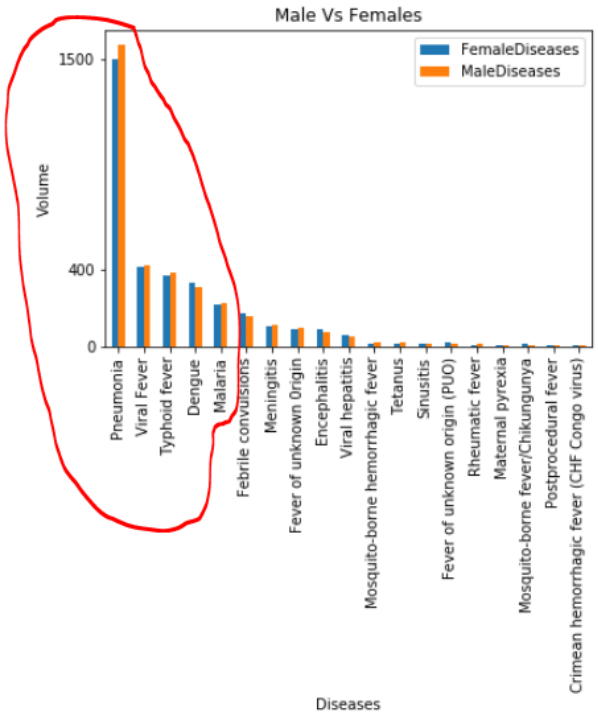
Typhoid Fever (372)

Below table show Top Five Disease:

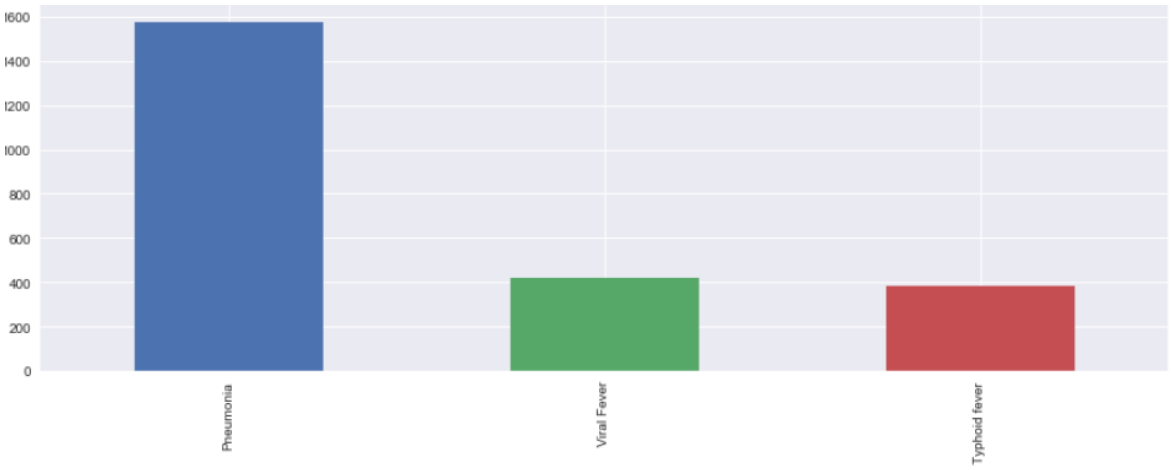
	Female Diseases	F_Per	MaleDiseases	M_Per	T.Diseases	T.Diseases_Per
Pneumonia	1500	43.77	1572	45.17	3072	44.50
Viral Fever	413	12.05	418	12.01	831	12.04
Typhoid fever	372	10.85	381	10.95	753	10.91
Dengue	333	9.72	308	8.85	641	9.29
Malaria	220	6.42	223	6.41	443	6.42

1. Pneumonia
    1. Effect male more than Females
    2. Most top disease effect to both
2. Viral Fever
    1. Effect females more than Males
3. Typhoid Fever
    1. Effect males more than Females

1. Pneumonia
    1. Effect male more than Females
    2. These diseases are effected to both
2. Viral Fever
    1. Effect females more than Males
3. Typhoid Fever
    1. Effect males more than Females



4. Most common Disease in Females

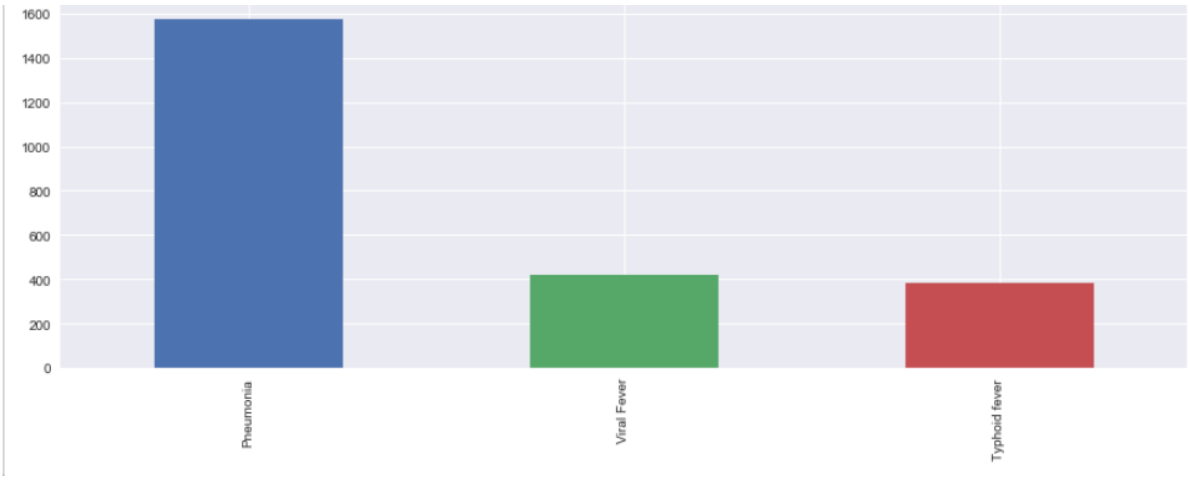


Pneumonia 1500

Viral Fever 413

Typhoid fever 372

5. Most common Disease in Male



- Pneumonia 1,572
- Viral Fever 418
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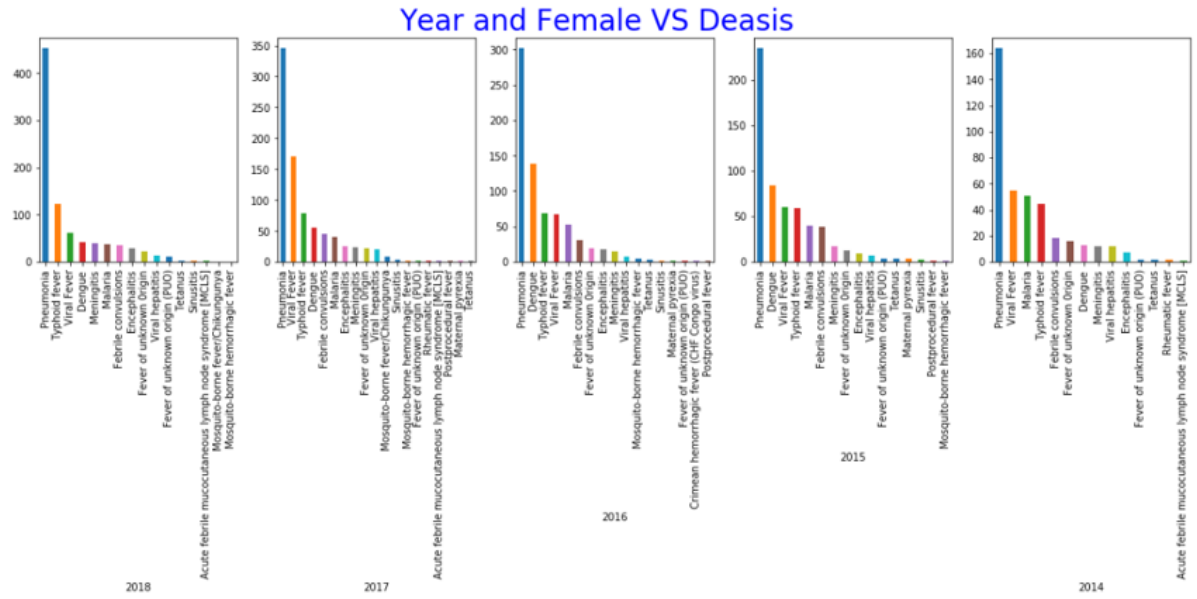
Yearly Male VS female having most common Disease

5. In which year female having most common Disease



5. In which year female having most common Disease

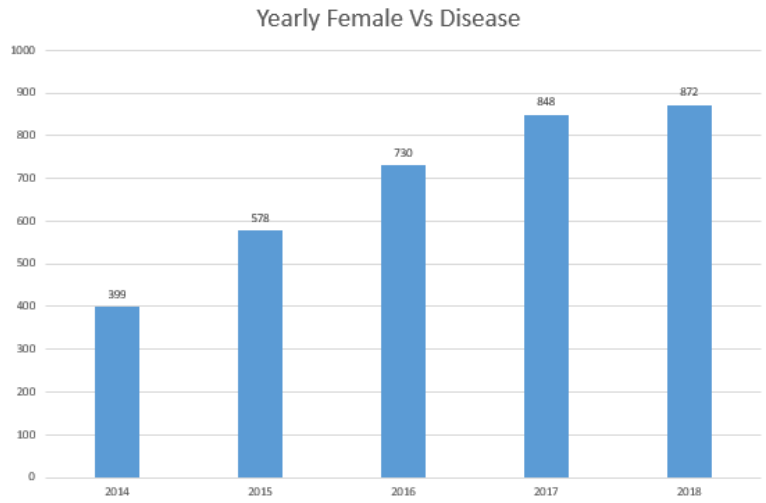
Year: 2018
Total 872
Pneumonia 453
Typhoid fever 123
Viral Fever 61

Year: 2017
Total 848
Pneumonia 346
Viral Fever 170
Typhoid fever 78

Year: 2016
Total 730
Pneumonia 302
Dengue 139
Typhoid fever 68

Year: 2015
Total 578
Pneumonia 235
Dengue 84
Viral Fever 60

Year: 2014
Total 399
Pneumonia 164
Viral Fever 55
Malaria 51



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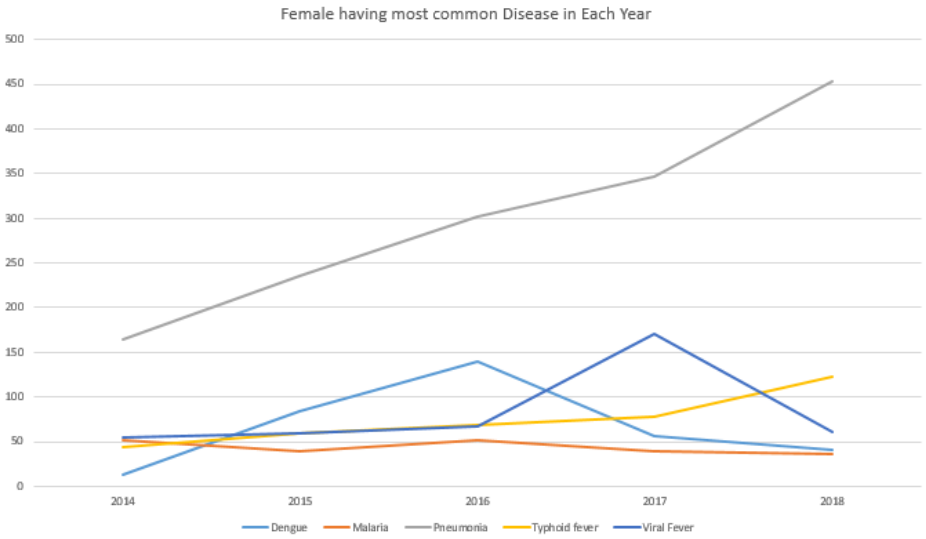

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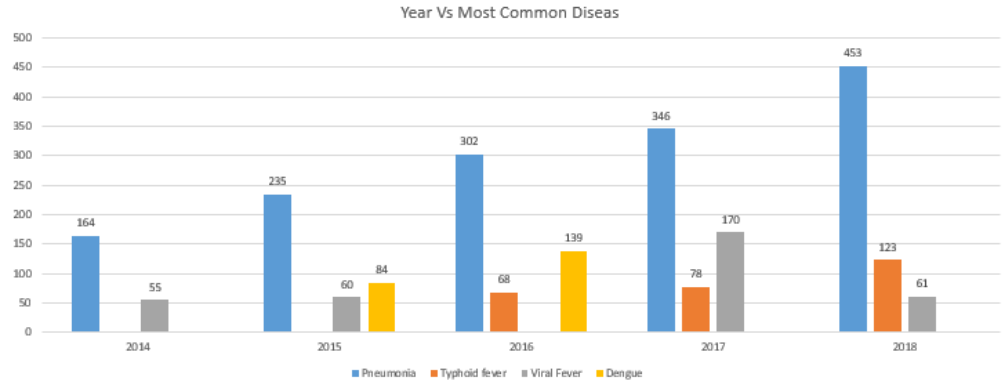


1. Most common disease is "Pneumonia"
2. Second most common disease after 2016 is "Typhoid"
3. Viral Fever is 3rd Disease we are facing in 2019

6. In which year Male having most common Disease

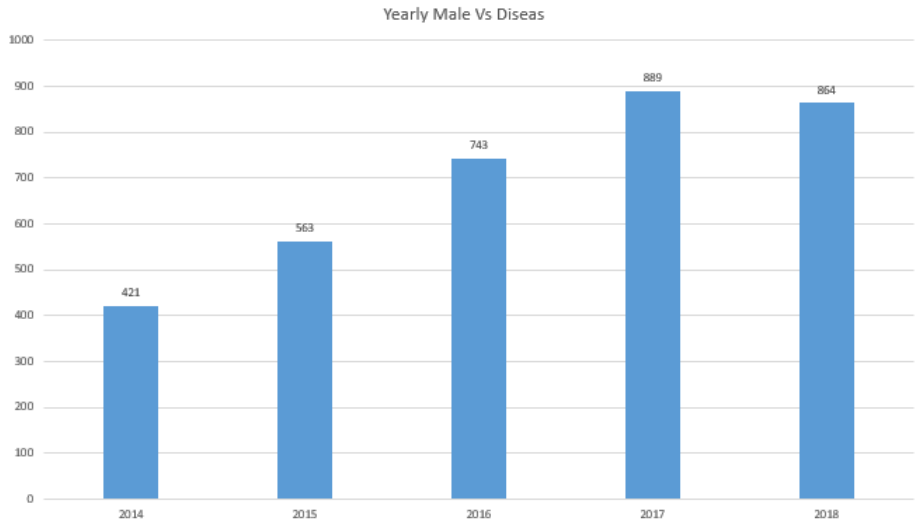
Year: 2017
Total 889
Pneumonia 391
Viral Fever 168
Typhoid fever 81

Year: 2018
Total 864
Pneumonia 436
Typhoid fever 115
Viral Fever 71

Year: 2016
Total 743
Pneumonia 327
Dengue 110
Typhoid fever 71

Year: 2015
Total 563
Pneumonia 249
Dengue 65
Viral Fever 63

Year: 2014
Total 421
Pneumonia 169
Typhoid fever 64
Viral Fever 48



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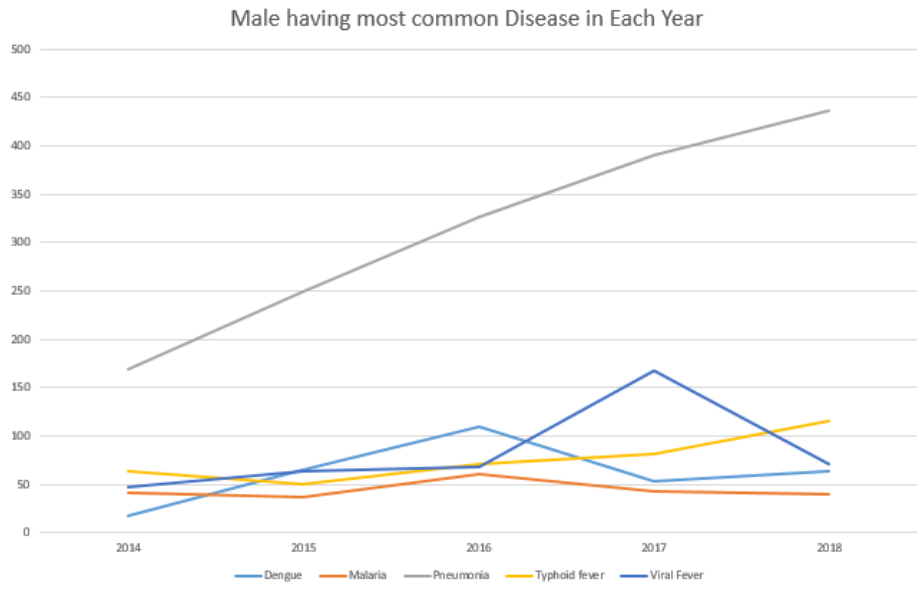

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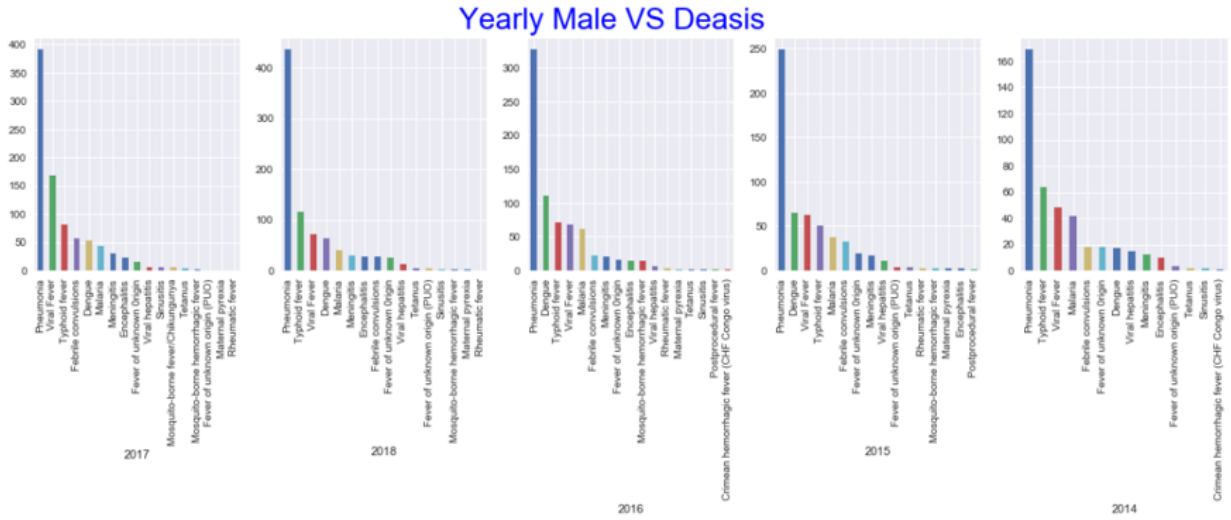
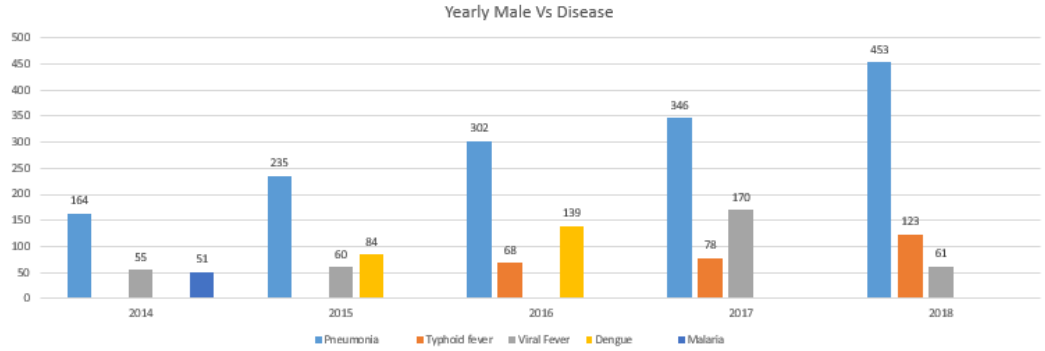


6. In which year Male having most common Disease



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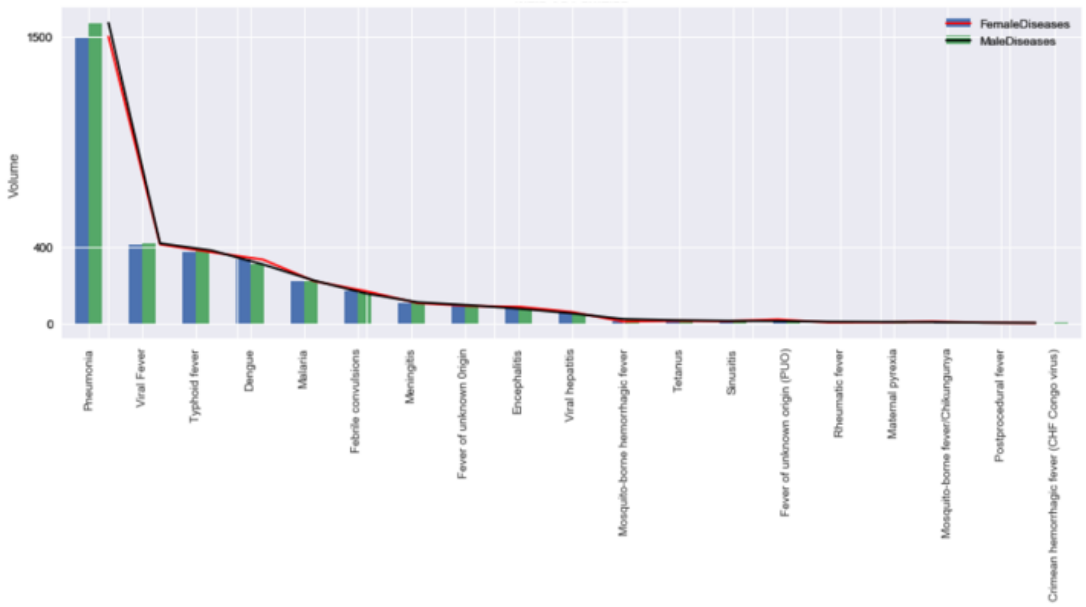
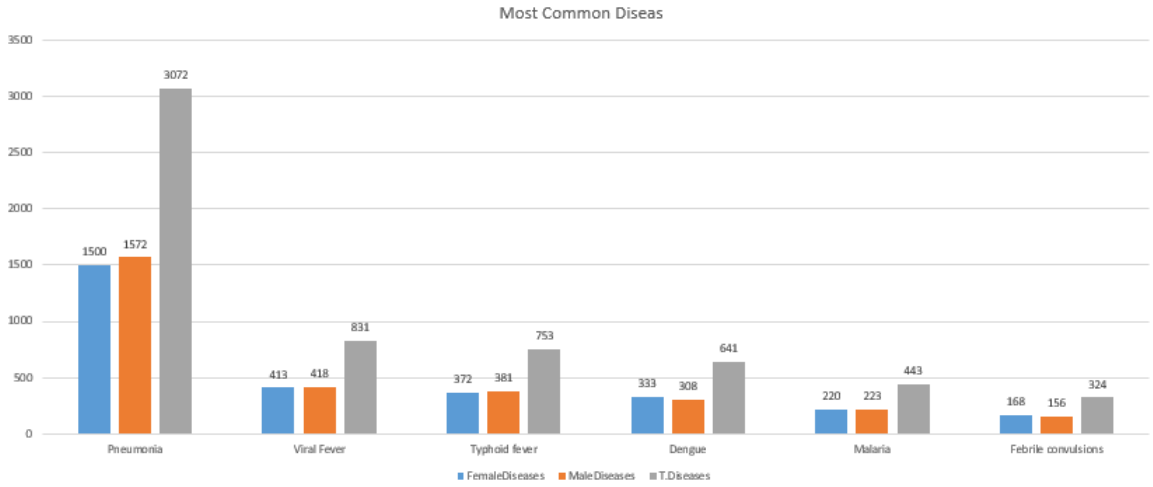
7. Male vs Female disease pattern



8. Most common Disease in male and female



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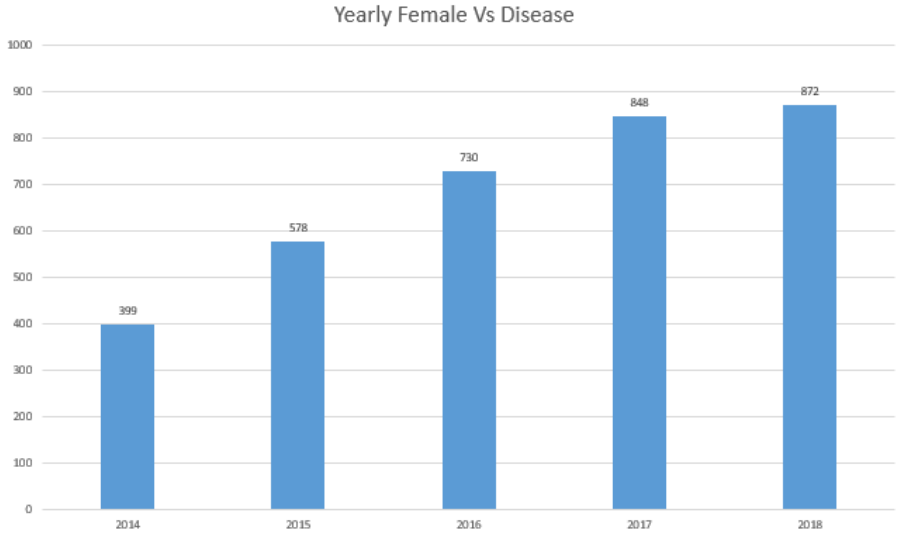

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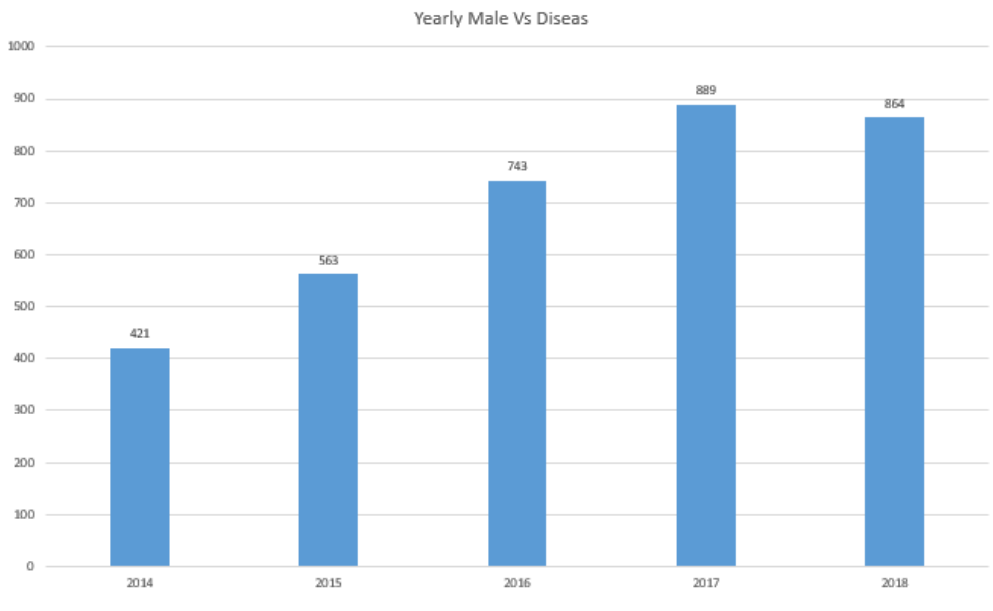

10. Visualization of all results

1. Seaborn, matplotlib and pandas plot
2. Bar chart, line chart
3. Subplots

iii. Model Planning

using Machine learning technique to draw the relation between input variables. Planning for a model is performed by using different statistical formulas and visualization tools. SQL analysis services, ML, and DL are some of the tools used for this purpose.

iv. Model Building

In this step, the actual model building process starts. Here, Data scientist distributes datasets for training and testing. Techniques like association, classification, and clustering are applied to the training data set. The model once prepared is tested against the "testing" dataset.

v. Operationalize

In this stage, you deliver the final baselined model with reports, code, and technical documents. Model is deployed into a real-time production environment after thorough testing.

vi. Communicate Results

In this stage, the key findings are communicated to all stakeholders. This helps you to decide if the results of the project are a success or a failure based on the inputs from the model.