EXECUTIVE SUMMARY REPORT ON HEALTHCARE DATASET

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BUSINESS GOAL

- Using healthcare data set, perform an exploratory data analysis and develop interactive dashboard with visuals showing impact of demographic, behavioral and social factors on health disease and hypertension.

What are the key influencing factors on both diseases?

DATA SOURCE & TOOLS

❑ The source for the database for the analysis is
- Postgres SQL Server - Datatechon

❑ The data analytics tool used are:
- Excel
- Power BI

KEY METRICS & DIMENSIONS

❑ METRICS
- Total patients

- Hypertensive patients

- Heart Disease patients

❑ DIMENSION
- Demography : Gender, Age group

- Behavioral: BMI level, and Avg. glucose level

- Social: Smoking status, Marital status, Work type and Residence type

METHODOLOGY

❑ Import dataset via excel integrated in Power BI

Source = Excel.Workbook(File.Contents("C:\Users\okari\OneDrive\Desktop\DesktopFolders\Datatechcon\Capstone\Dataset\Healthcare Disease.xlsx"), null,true),#"Healthcare sickness data_Sheet" = Source{[Item="Healthcare sickness data",Kind="Sheet"]}[Data],

METHODOLOGY

❑ Data cleaning and transformation using Excel & Power BI

- Sort rows in Ascending order and transform

- Replace values - "0" & "1" with "Negative" & "Positive"
  Table.ReplaceValue(#"ChangedType2","0","Negative", Replacer.ReplaceText,{"heart_disease"})

- Filter values - to remove "unknown" and "null"

- Create data bucket by listing data range in groups – Age group, BMI group, Average glucose level

METHODOLOGY

❑ Data exploration by developing an interactive dashboard to identify key insights using Power BI

- Patients view
- Demography view- Age and Gender
- Behavioral view – AGL and BMI
- Social view: Marital status, Smoking status, Work type, Resident type

❑ Generate key insights from data exploration

❑ Recommendation on best traffic sources to launch marketing campaigns

DATA EXPLORATION

PATIENTS ANALYSIS

Female | Male | 0-14 (Children) | 15-24 (Youths) | 25-64 (Adults) | 65-82 (Seniors)

Normal | Obesity | Overweight >

Diabetes | Low sugar | Normal sugar >

12K
Total Patients

463
Heart Disease only

1207
Hypertension only

183
Heart Disease & Hyp

11K
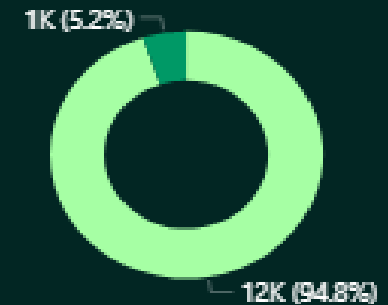Healthy patient

Total Patients by Marital status
● Married ● Not Married

3K (25.51%)

9K (74.49%)
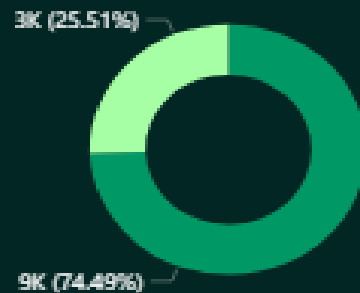
Total Patients by Hypertension
● Negative ● Positive

1K (11.19%)

11K (88.81%)
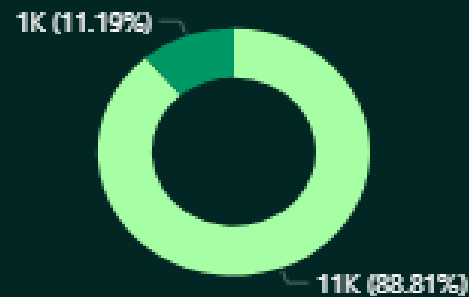
Total Patients by Heart disease
● Negative ● Positive

1K (5.2%)

12K (94.8%)

Total Patients by Smoking status

Never Smo... — 6.7K

Formerly S... — 3.1K

Smokes — 2.6K

Smoking status / Total Patients
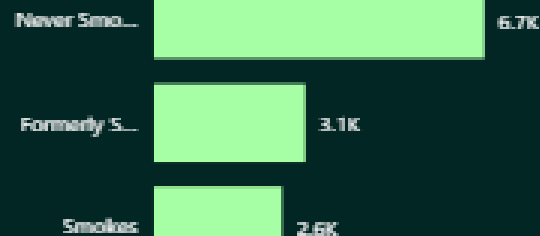
Total Patients by Work status

Private — 8216

Self-Empl... — 2173

Govt_Job — 1768

Children — 225

Never_W... — 41
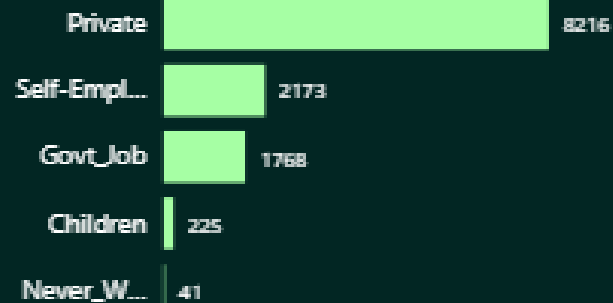
Total Patients

Total Patients by Residence type
● Rural ● Urban

6K (49.86%)

6K (50.14%)
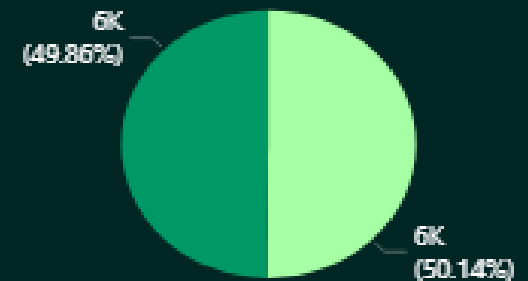
DEMOGRAPHY ANALYSIS

Select Glucose Level

Diabetes	Low sugar	Normal sugar	Prediabetes

Select BMI group

Normal	Overweight
Obesity	Underweight

12K
Total Patients

251
Children (0-14 yrs)

1473
Youths (15-24 yrs)

8056
Adults (25-64 yrs)

2643
Seniors (65-82 yrs)

Total Patients by Gender

● Female ● Male

5K (39.16%)

8K (60.84%)

Patients with hypertension by gender

● Female ● Male

589 (42.37%)

801 (57.63%)

Patients with heart disease by Gender

● Male ● Female
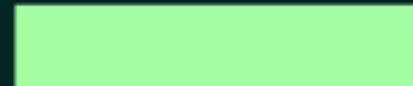
254 (39.32%)

392 (60.68%)

Age (groups)	Total Patients
⊟ 0-14 (Children)	251
Female	121
Male	130
⊟ 15-24 (Youths)	1473
Female	921
Male	552
⊟ 25-64 (Adults)	8056
Female	5014
Male	3042
⊟ 65-82 (Seniors)	2643
Female	1502
Male	1141
Total	**12423**

Patients with hypertension by Age (groups)
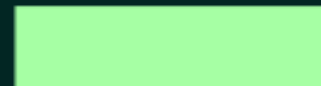
- 25-64 (Adults): 780
- 65-82 (Senio...): 605
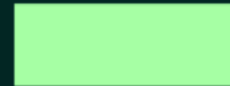- 15-24 (Yout...): 5

Patients with heart disease by Age (groups)

- 65-82 (Seniors): 413
- 25-64 (Adults): 230
- 15-24 (Youths): 3

BEHAVIORAL ANALYSIS

Total Patients by average glucose level (by group)

1684	**8.75K**
Low sugar (50-70)	Normal sugar (70-140)
1055	**937**
Diabetes(200-280)	Prediabetes (140-199)

Total Patients by BMI condition (by group)

3923	**2886**
Overweight(25-29.9)	Normal (18.5-24.9)
192	**5422**
Underweight (<18.5)	Obesity (>30)

BMI by gender (Hyp)

Gender	Patients
⊟ **Female**	**801**
Normal	101
Obesity	477
Overweight	217
Underweight	6
⊟ **Male**	**589**
Normal	53
Obesity	357
Overweight	177
Underweight	2
Total	**1390**

AGL by gender (Heart)

Gender	Patients
⊟ **Male**	**392**
Normal	205
Diabetes	91
Prediabetes	53
Low sugar	43
⊟ **Female**	**254**
Normal	125
Diabetes	56
Prediabetes	45
Low sugar	28
Total	**646**

Select Gender

- ☐ Female
- ☐ Male

Select Age group

0-14 (Children)	15-24 (Youths)	25-64 (Adults)	65-82 (Seniors)

Patients that have hypertension by Avg. Glucose Level

Normal sugar	801
Diabetes	297
Prediabetes	153
Low sugar	139

Patients with heart disease by Avg. Glucose Level

Normal sugar	330
Diabetes	147
Prediabetes	98
Low sugar	71
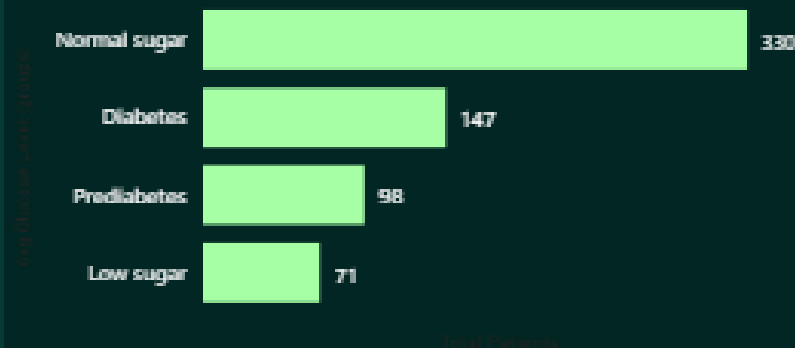
Patients with hypertension by BMI group

Obesity	834
Overweight	394
Normal	154
Underweight	8
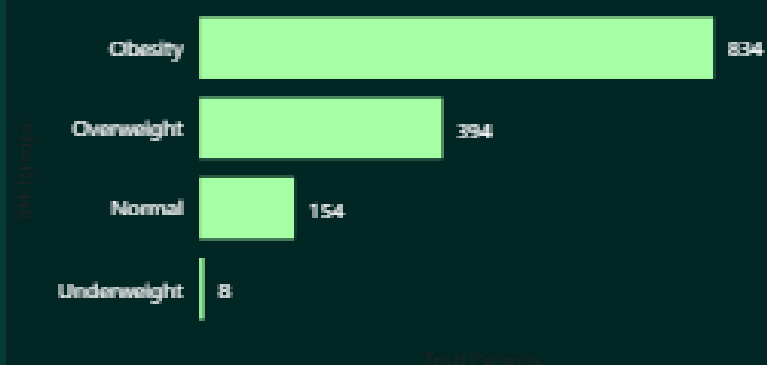
Patients with heart disease by BMI group

Obesity	341
Overweight	212
Normal	92
Underweight	1
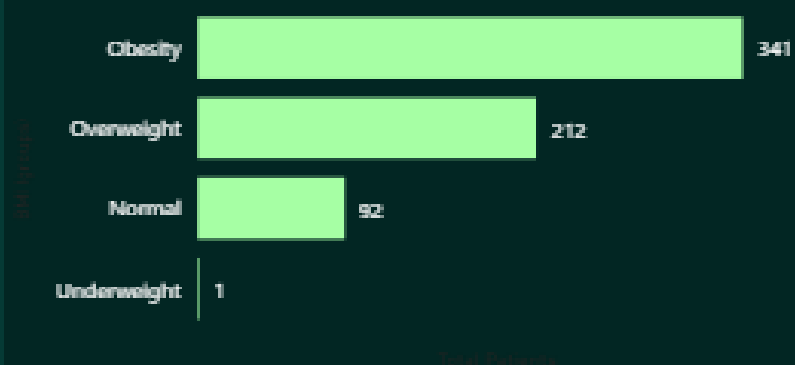
SOCIAL ANALYSIS

Select Gender
- ☐ Female
- ☐ Male

Select Age group
| 0-14 (Childre... | 15-24 (Youths) | 25-64 (Adults) | 65-82 (Seniors) |

Select BMI group
| Normal | Obesity | Overweight |

Select Avg. Glucose Level group
| Diabetes | Low sugar | Normal sugar |

Patients with hypertension by Marital status
● Married ● Not Married
- 140 (10.07%)
- 1250 (89.93%)

Patients with heart disease by Marital status
● Married ● Not Married
- 46 (7.12%)
- 600 (92.88%)

Patients with hypertension by Work type
- Private: 825
- Self-Empl...: 361
- Govt_Job: 204

Patients with heart disease by Work type
- Private: 353
- Self-Empl...: 203
- Govt_Job: 89
- Never_Wo...: 1

Patients with hypertension by Smoking status
- Never Smoked: 735
- Formerly Smoked: 389
- Smokes: 266

Patients with heart disease by Smoking status
- Formerly Smoked: 248
- Never Smoked: 236
- Smokes: 162

Patients with hypertension by Residency type
● Urban ● Rural
- 689 (49.57%)
- 701 (50.43%)

Patients with heart disease by Residency type
● Rural ● Urban
- 304 (47.06%)
- 342 (52.94%)
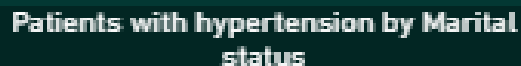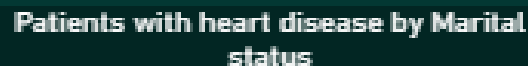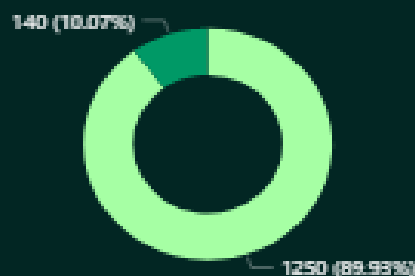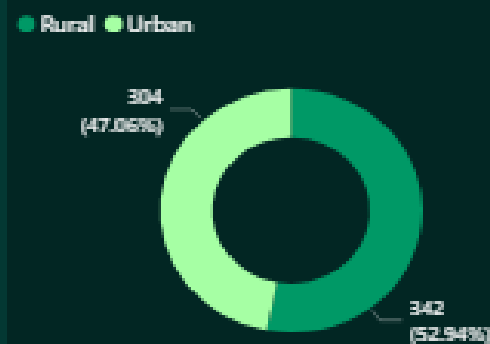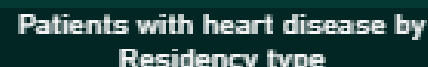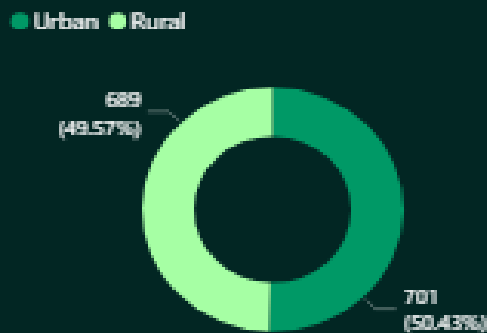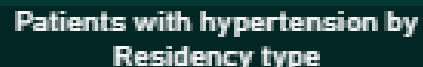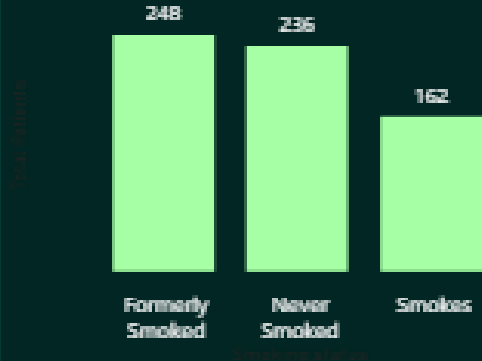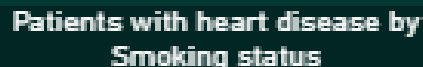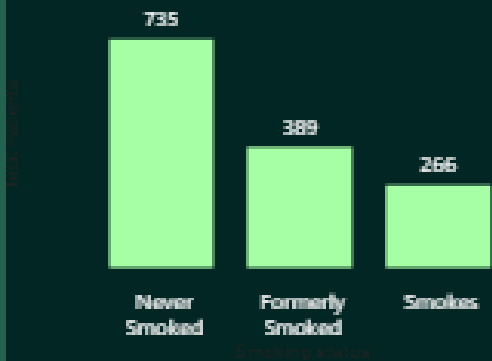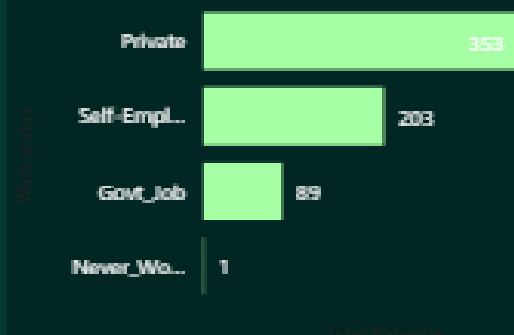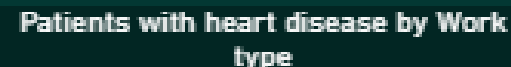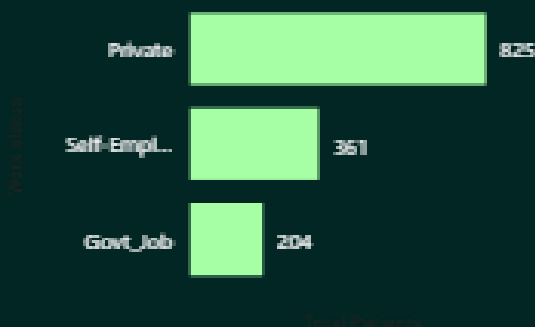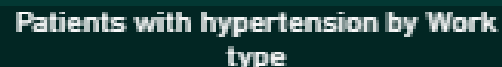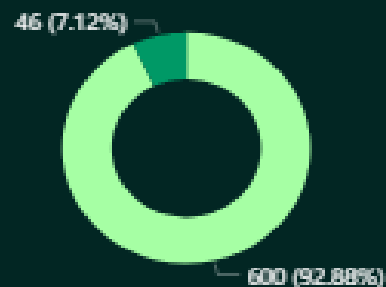
KEY INSIGHTS

PATIENTS

❏ 11.19% of a total of 12K total patients are diagnosed with hypertension
- 9.7% diagnosed with hypertension only
- 1.5% diagnosed with both disease

❏ 5.2% of a total of 12K total patients are diagnosed with heart disease
- 3.7% diagnosed with heart disease only
- 1.5% diagnosed with both disease

- More patients are diagnosed with hypertension than heart disease.

GENDER

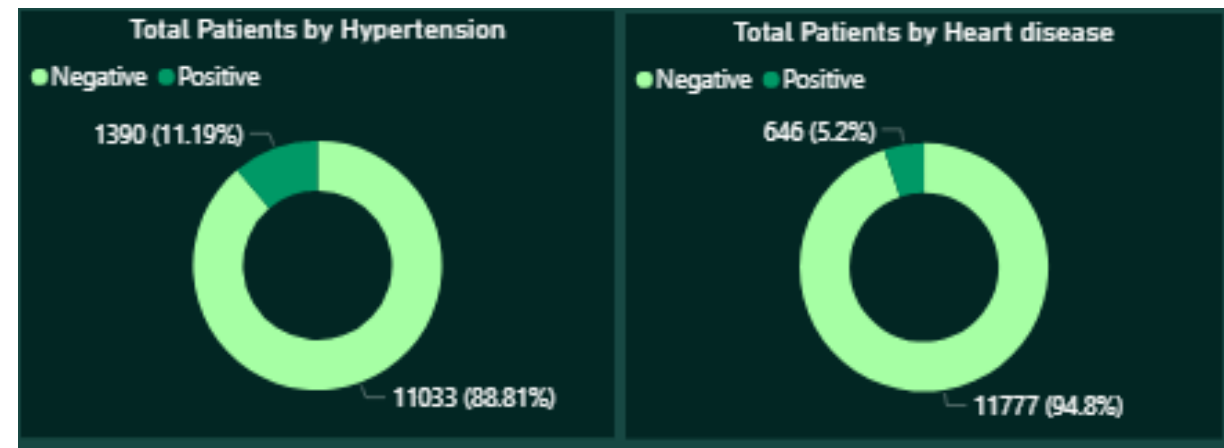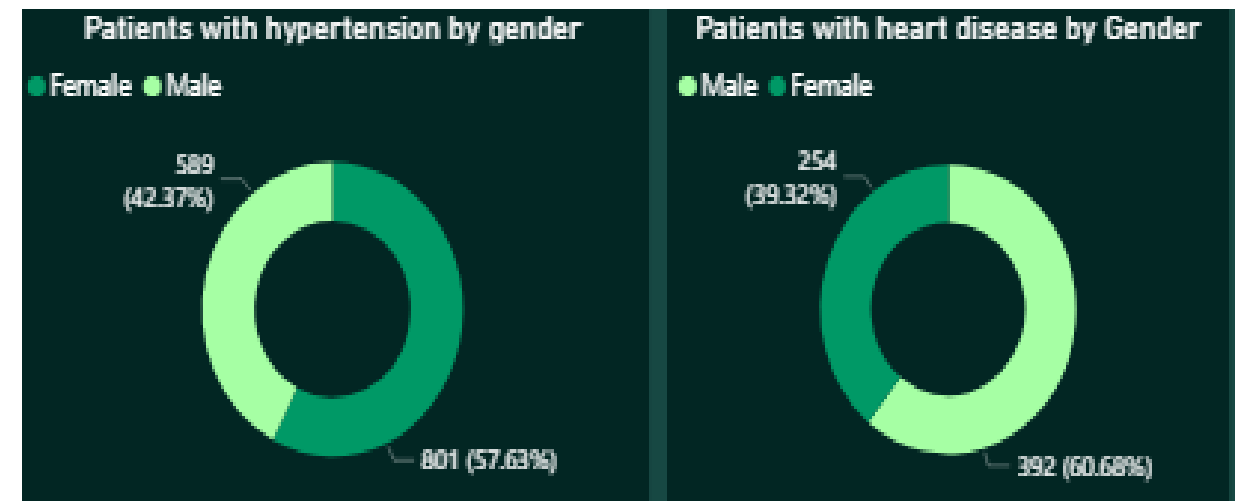- ❑ 57.63% of patients diagnosed with hypertension are female
  - ▪ The female gender appears to suffer more from hypertension

- ❑ 60.68% of patients diagnosed with heart disease are male
  - ▪ The male gender appears to suffer more from heart disease

AGE

Patients with hypertension by Age (groups)

Age group	Count
25-64 (Adults)	780
65-82 (Senio...)	605
15-24 (Yout...)	5

Patients with heart disease by Age (groups)

Age group	Count
65-82 (Seniors)	413
25-64 (Adults)	230
15-24 (Youths)	3
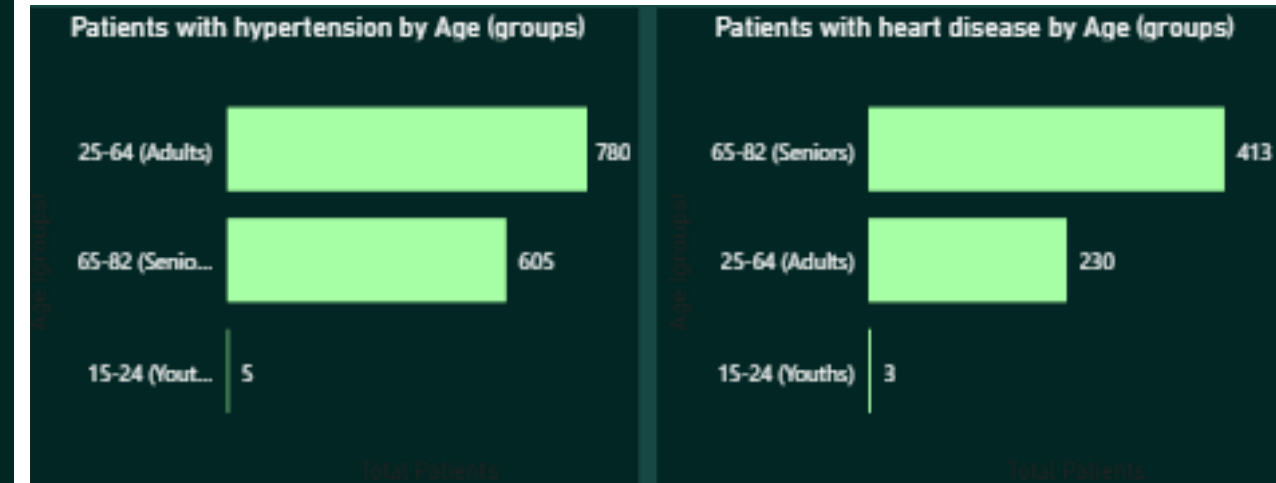
❑Adults ranked highest with 56% among patients diagnosed with hypertension
  ▪ Adults seem to suffer more from hypertension

❑ Seniors ranked highest with 64% among patients diagnosed with heart disease
  ▪ Seniors seem to suffer more from heart disease

AVERAGE GLUCOSE LEVEL

Patients with hypertension by Avg. Glucose Level

Normal sugar	801
Diabetes	297
Prediabetes	153
Low sugar	139

Patients with heart disease by Avg. Glucose Level

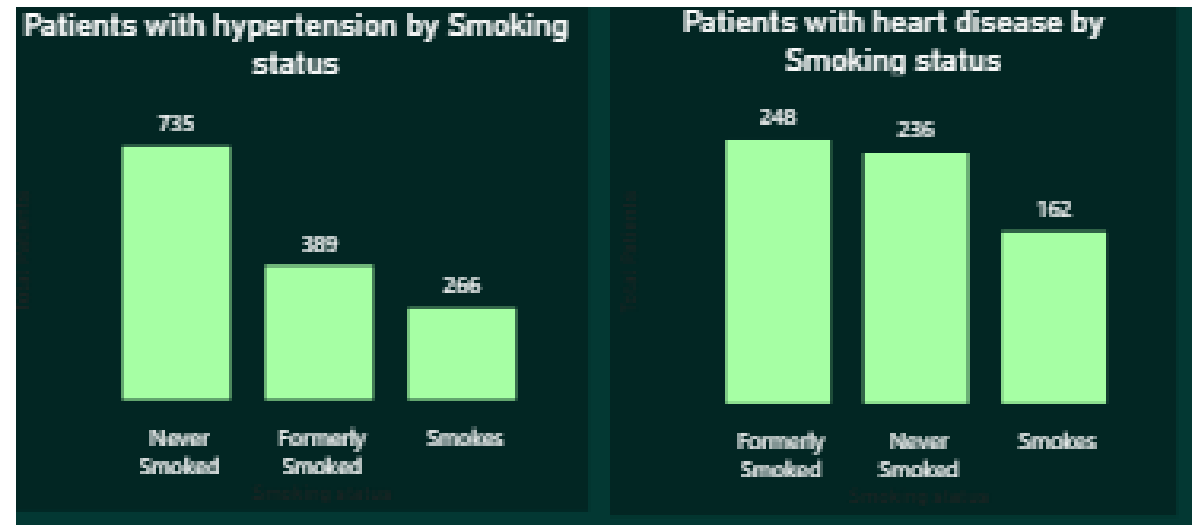|	
Normal sugar	330
Diabetes	147
Prediabetes	98
Low sugar	71
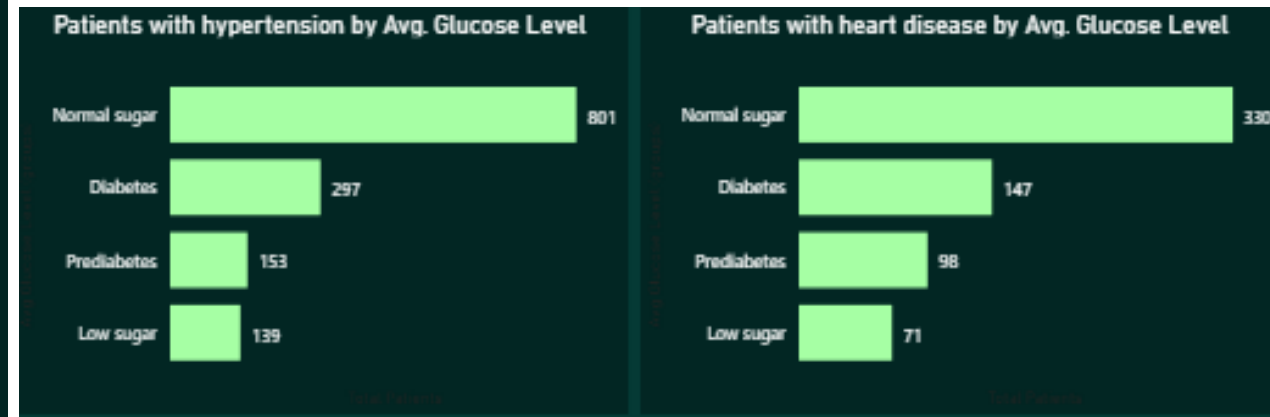
❑ The Avg. glucose level of 58% of patients with hypertension falls within the Normal sugar level

❑ The Avg. glucose level of 51% of patients with heart disease falls within the Normal sugar level

▪ Blood sugar level does not necessarily have to be above normal to be hypertensive or have a heart disease

BODY MASS INDEX (BMI)

❑ The BMI shows that 60% of patients with hypertension are obese

❑ The BMI shows that 53% of patients with heart disease are obese

▪ Patients suffering from obesity are more likely to be diagnosed for hypertension and heart disease

SMOKING STATUS

Patients with hypertension by Smoking status

735	389	266
Never Smoked	Formerly Smoked	Smokes

Patients with heart disease by Smoking status

248	236	162
Formerly Smoked	Never Smoked	Smokes

❏ Patients with hypertension that never smoked ranked highest with 53%

❏ Patients with heart disease that previously smoked ranked highest with 38%

▪ Patients with smoking history are more likely to develop heart disease

MARITAL STATUS
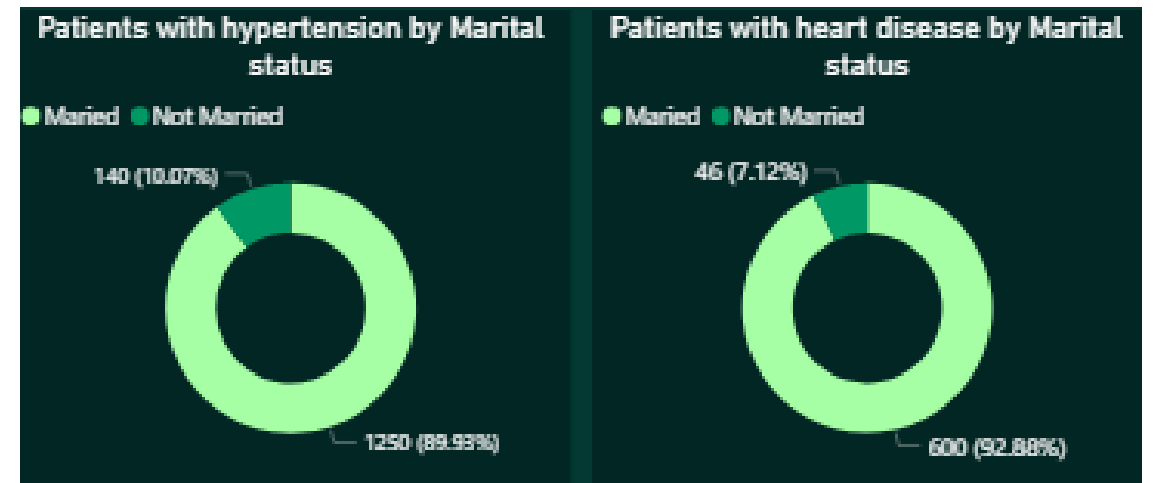
❑ 90% of patients with hypertension are married

❑ 93% patients with heart disease are married

▪ Married patients have higher chances of being diagnosed with hypertension and heart disease

WORK TYPE
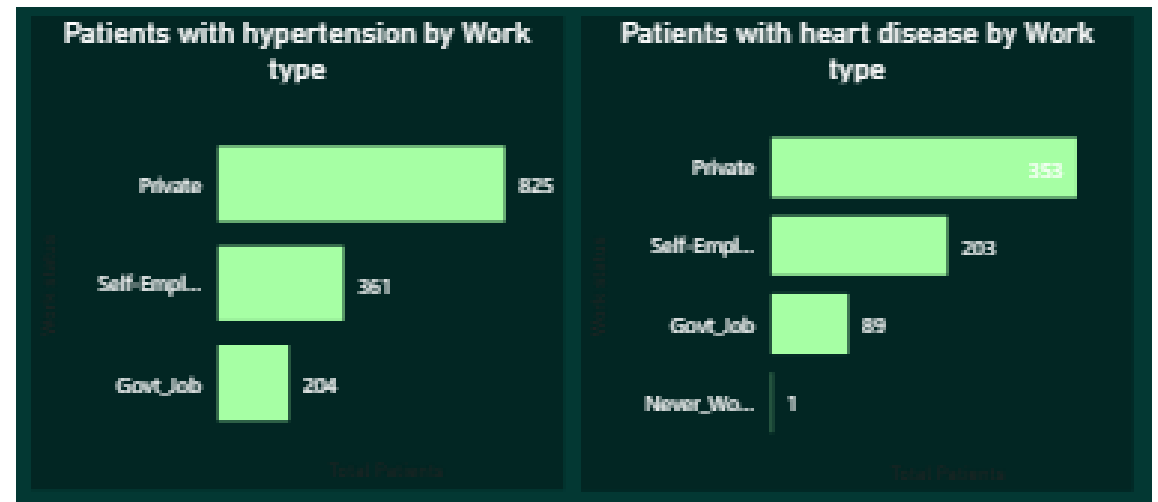
❑ 59% of patients with hypertension work privately

❑ 55% of patients with heart disease work privately

▪ Patients working jobs with less activities seems prone to hypertension & heart disease

RESIDENT TYPE
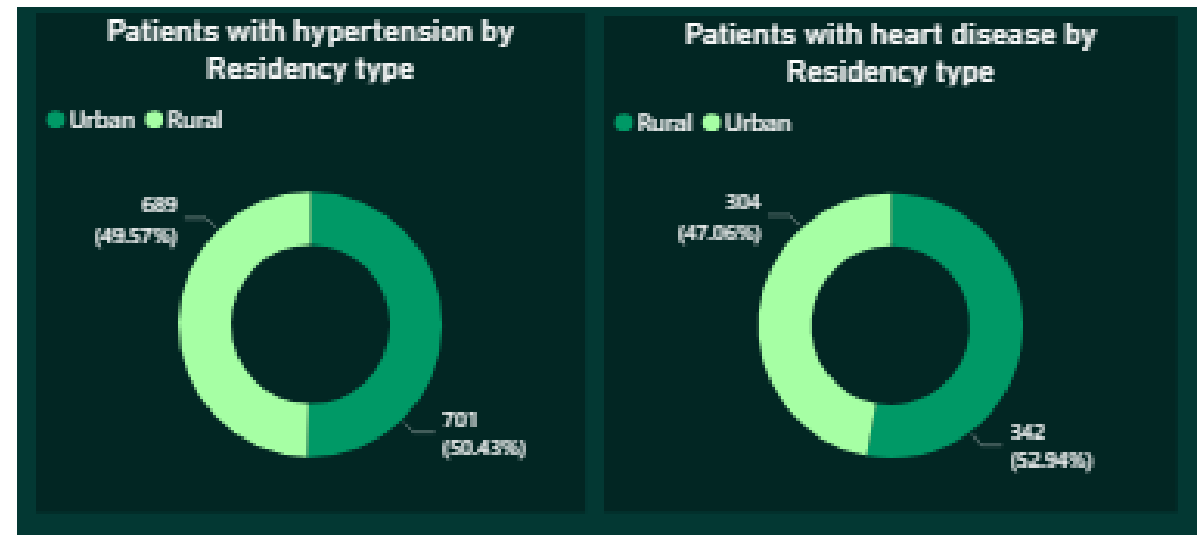
❑ 50% of patients with hypertension lived in an urban area

❑ 53% of patients with heart disease lived in a rural area

RECOMMENDATION

❑ 9.7% of patients diagnosed with hypertension are not diagnosed with heart disease. Patients with high blood pressure should get their blood pressure under control to avoid deteriorating into heart disease

❑ The Age group shows Adults suffer more from hypertension and If not controlled as they grow into Seniors; they end up developing a heart disease. This corroborate that hypertension could lead into heart disease.

❑Obese patients should monitor their weight regularly, exercise and be consistent with their prescribed weight loss regimen

❑ Higher resources need and financial responsibility among married patients could account for their high risk of developing hypertension and heart disease. Married patients should employ effective stress management, resources planning and prioritize regular health checkup.

❑Patients who have a sedentary work type like those working privately should involve in more active live style and exercises to control their blood pressure