Hypertension and heart disease impact on stroke occurrence

We are interested in how the hypertension and heart disease impact on the stroke occurrence in our dataset. In the dataset we check individual’s health status based on hypertension and heart disease and categorize into four types: healthy individuals who don't; individuals who only have hypertension; individuals who only have heart disease; individuals who have both hypertension and heart disease.

|  |  |  |
| --- | --- | --- |
| hypertension | heart\_disease | Count |
| 0 | 0 | 4273 |
| 1 | 0 | 393 |
| 0 | 1 | 185 |
| 1 | 1 | 58 |

We create a pie chart to visualize the health status distribution based on the conditions of hypertension and heart disease on the whole dataset. From the graph 87% individulas are healthy, 8% have hypertension and 3.8% have heart disease and 1.2% individuals have both disease

A diagram of a health status distribution

Description automatically generated

Take a closer look from the dataset, we create the summary table to only count the stroke and no stroke for each health status.

|  |  |  |
| --- | --- | --- |
| **Health Status** | **Stroke** | **No Stroke** |
| Healthy | 120 | 4153 |
| Hypertension | 49 | 344 |
| Heart Disease | 29 | 156 |
| Hypertension and heart disease | 11 | 47 |

Based on above summary table we create a pie chart to study health status for individuals who had stroke. From below chart we can see more than half of people who had stroke also suffer hypertension and heart disease (57.4% of stroke population), and only 5.3% of individuals who had stroke is healthy.

A diagram of a health status

Description automatically generated

Furthermore, we want to see the stroke status in each health status. We tried to create the bar chart which counts the number of stroke and non-stroke individuals for each health status. However, the size of each health status group is not equal, and healthy group is much larger than the other groups. From the bar chart below, it is difficult to compare among groups. Instead, we create a bar chart based on the stroke percentage for each group.

#create a bar chart to visualize the impact of hypertension and heart disease on stroke.

A graph with blue and red squares

Description automatically generated

#create a bar chart that show percentage of the stroke for the four health types

A graph of blood pressure

Description automatically generated

The stroke percentage in Hypertension and Heart Disease is the highest group (18.96%) then followed by heart disease group (15.66%). In the healthy group, only 2.8% individuals had stroke.

Based on above pie charts and bar charts, chance of stroke for healthy individuals is much lower than individuals who have either heart disease or hypertension, and chance for individuals who suffer both hypertension and heart disease have stroke is high.