ANALYSIS OF TUMOR

(HEAD & NECK)

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**GitHub Link:-** https://github.com/sai7088/Analysis-of-Tumor-Head-And-Neck-.git

Motivation and Overview :-

Data analysis of head and neck tumors can provide important insights into the characteristics and behavior of these tumors, as well as their diagnosis, treatment, and prognosis.There are several motivations for analysing head and neck tumor data. Firstly, the incidence of head and neck tumor is increasing worldwide, and it is important to understand the underlying factors contributing to this trend. Secondly, analyzing head and neck tumor data can help in the development of more effective diagnostic and treatment strategies, particularly for more aggressive or advanced tumors. Thirdly, data analysis can provide information on the outcomes of different treatment approaches, which can help in the development of more personalized treatment plans for patients.

Related Work :-

We had referred some of research papers regarding head and neck tumors they are A comparison of machine learning algorithms for head and neck cancer prognosis prediction- by Zhang et al. (2020) - This paper compares the performance of different machine learning algorithms for predicting prognosis in head and neck cancer patients. "Radiomics in Head and Neck Cancer: A Primer for Radiation Oncologists" by Jethanandani et al. (2018) - This paper provides an overview of radiomics in head and neck cancer, including image acquisition, feature extraction, and analysis.

Initial Questions:-

The initial questions arised to us are. Does this tumor is curable or not . which treatment gives us the best result .Does the patient has any previous health related issues and how the treatment works. What are the potential risks and benefits of different treatment options.

Data:-

The reason why we selected Head and Neck Data set is because of the following

Clinical data - This includes demographic information such as age and gender, as well as medical history, tumor stage, and treatment history.

Once the data has been obtained, it needs to be cleaned and preprocessed. This may involve removing missing or incomplete data, standardizing variable names and units, and converting data to a consistent format. In imaging studies, preprocessing may involve segmenting the tumor from surrounding tissues and extracting radiomic features.

After preprocessing, the data can be explored and analyzed using various statistical and machine learning techniques. This may involve identifying patterns and correlations between variables, developing predictive models for diagnosis and prognosis, and evaluating the efficacy of different treatment approaches.

Throughout the analysis, it is important to maintain data quality and integrity. This may involve ensuring the data is properly anonymized and secured, verifying the accuracy of data entry and processing, and avoiding biases or confounding factors that may affect the analysis.

Overall, data import and wrangling are important steps in head and neck tumor analysis, as they lay the foundation for further exploration and analysis of the data.

The data may be collected from various sources, such as medical records, clinical trials, or public databases. Preprocessing steps may be required to standardize variable names and formats, remove missing or incomplete data, and prepare the data for analysis.

In head and neck tumor analysis, the data is typically analyzed using statistical and machine learning techniques to identify patterns and relationships between variables, develop predictive models for diagnosis and prognosis, and evaluate the efficacy of different treatment approaches.

Exploratory Data Analysis:-

Data visualization:-

Various graphical techniques can be used to visualize the data, such as bar charts, bar plots, and pie. These visualizations can help identify patterns, trends, and outliers in the data. For example, bar chart can be used to visualize the relationship between two continuous variables, such as age and frequency, while bar plots can be used to visualize the distribution of a variable across different categories, such as ajcc stagging .and box plot for highest number of people with tumor.

Data Analysis:-

We had used some statistical methods like mean, median, These statistics can help understand the data. For example, calculating the mean and median for age at diagnosis, biological\_sex, overall\_hpv\_p16\_status, chemotherapy, survival rate.

Narrative and Summary :-

The analysis of Tumor in Head and Neck data is a step-by-step process that involves collecting, organizing, and examining data. This process includes analyzing the data to understand patterns, trends, and relationships. It requires knowledge of statistical methods, data visualization, and machine learning techniques. The insights obtained from the analysis are important for understanding the characteristics of Tumor for developing effective treatment and prevention strategies.