

# Unveiling Inpatient Imaging Patterns and Diagnostic Outcomes Across Demographics

Joshua Leaston<sup>1</sup>, BS, Ank Agarwal<sup>1</sup>, BS, Henry Nguyen<sup>1</sup>, BS, Michael Iv<sup>1</sup>, MD  
<sup>1</sup>School of Medicine, Stanford University, Stanford, California

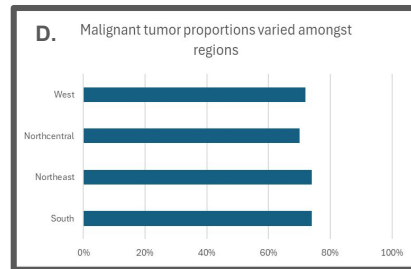
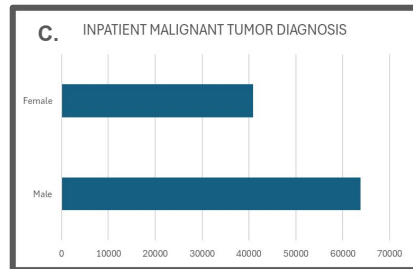
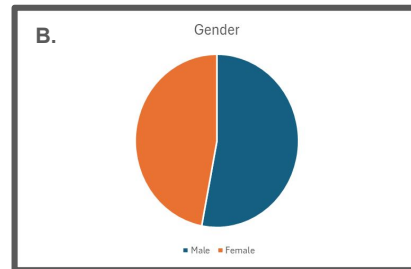
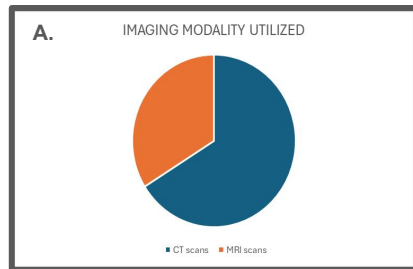


## INTRODUCTION

Neuroimaging is a critical way for physicians to diagnose a wide range of clinical pathologies. Results of the imaging are often utilized to guide the medical management plan. In this study, we investigated differences in the utilization of various imaging modalities in diverse patient populations. In addition, we evaluated the variability in the corresponding inpatient tumor diagnosis rates in the populations studied.

## METHODS

IBM marketscan was utilized to develop three cohorts depending on presence of the following neuroimaging history while being admitted as an inpatient: Contrast tomography (CT), Positron emission tomography (PET), and Magnetic resonance imaging (MRI). Demographic variables investigated included region and gender. Only patients with imaging history and medical management for brain tumors in 2021 were included in this study. Outcomes of interest in were neuroimage quantity, hospital stay duration, and inpatient tumor diagnoses.



## RESULTS

A total of 55,593 patients with 109,118 distinct hospital admissions were analyzed for neuroimaging. This included 71,789 admissions with CT scans, 36,811 with MRI scans, and 428 with PET scans (see figure A). Females accounted for 47% of total admissions (see figure B). There was a significant gender-based difference in malignant inpatient tumor diagnoses (male 63,841, female 40,929), as seen in figure C. A total of 61% of total brain tumors diagnosed in women were malignant, as compared to 83% in males. Males also had a longer hospital stay duration (10.44) and more neuroimaging (3.02) as compared to females (9.76 duration, 2.93 scans). Incidence of malignant tumor proportions varied amongst regions: South (74%), Northeast (74%), Northcentral (70%), West (72%), as demonstrated in figure D.

## CONCLUSION

This study revealed similarities in hospital stay duration, neuroimage utilization, and malignant inpatient tumor diagnoses across regions, but highlighted stark differences between males and females. Despite similar neuroimage quantity and hospital stays, inpatient males demonstrated a higher proportion of malignant tumors. These findings suggest a potential male predilection towards receiving a malignant brain tumor diagnosis while inpatient, as well as an increased incidence in men.

## NEXT STEPS

The next steps in this research involve investigating the underlying factors contributing to gender differences in inpatient tumor diagnoses.

Comparative analyses across healthcare systems will be evaluated to identify regional variations in access to neuroimaging services and healthcare delivery disparities. Future studies will isolate the impact of additional socioeconomic factors on imaging patterns with a focused scope, such as on isolated glioblastomas.

By addressing these gaps, we can work towards achieving more equitable healthcare delivery and improving patient outcomes for all individuals affected by brain tumors.