



Brain Glioma Markers, Factors, and Outcomes

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Data Introduction



Dataset from: UCSF

University of California at San Francisco

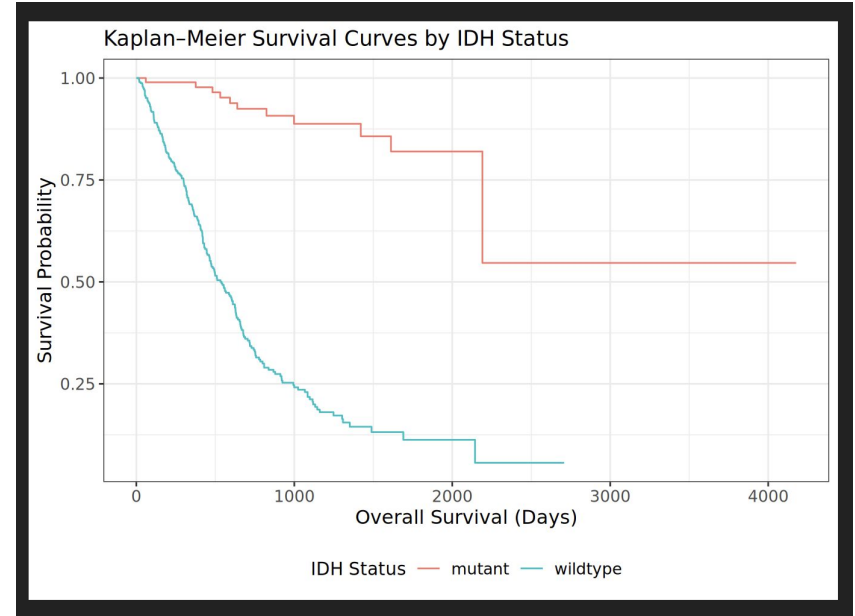
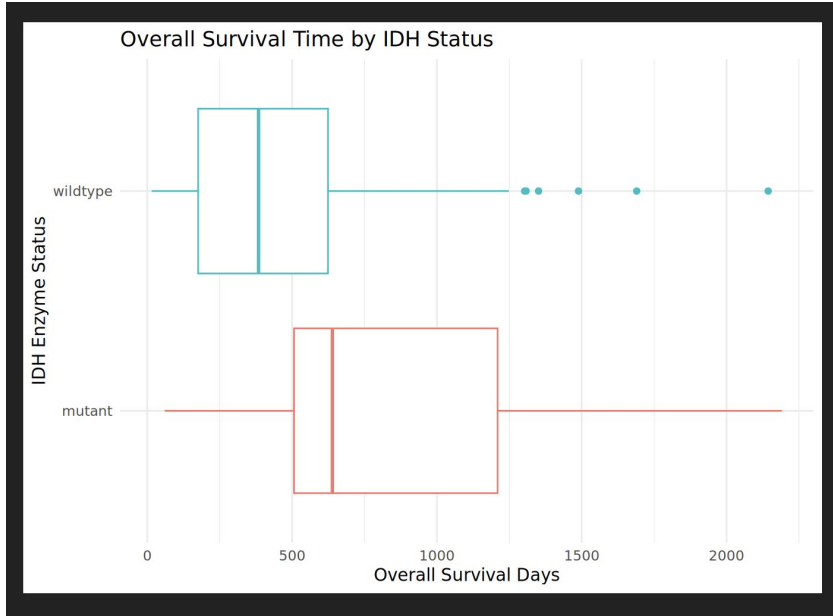
- **Participants:** 501 adult patients with histopathologically confirmed grade II-IV diffuse gliomas.
- **Timeline:** Data collected between 2015 and 2021; study published in 2022 and updated in 2025.
- **Procedures:** Includes results from preoperative MRIs, initial tumor resections, and genetic testing.



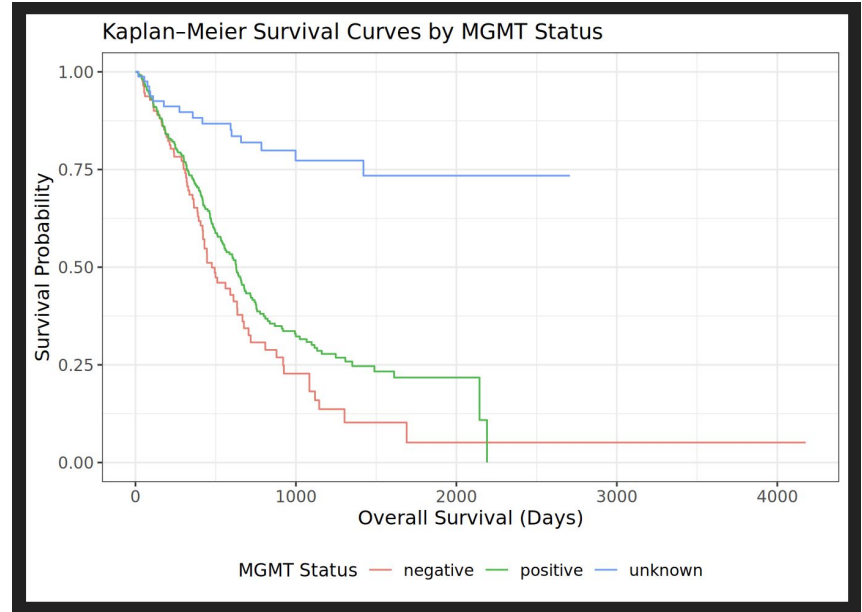
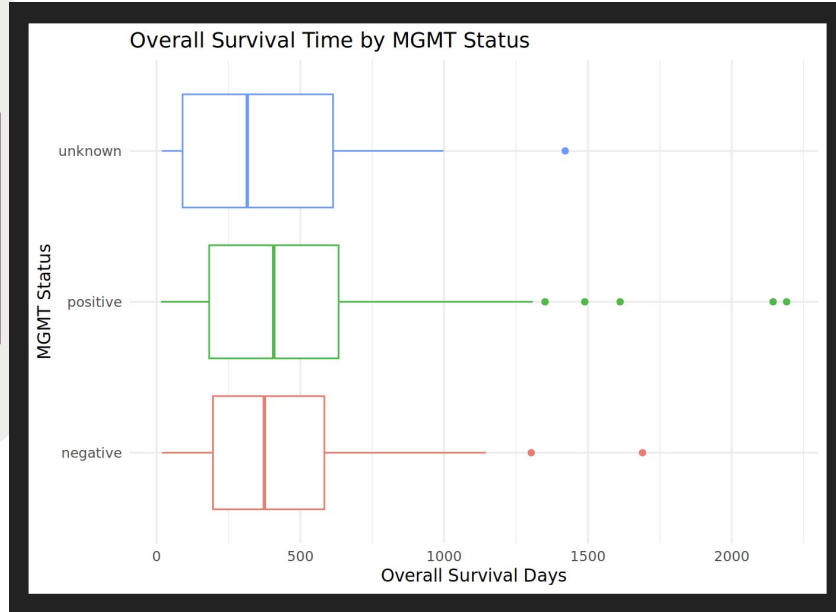
Observations

- **Demographics & Diagnosis:**
Sex, age, cancer grade, and diagnosis.
- **Biomarkers: MGMT:**
A repair enzyme used to predict chemotherapy success.
- **IDH Enzyme Type:**
Wildtype (typical, more aggressive)
Mutated (linked to better outcomes)

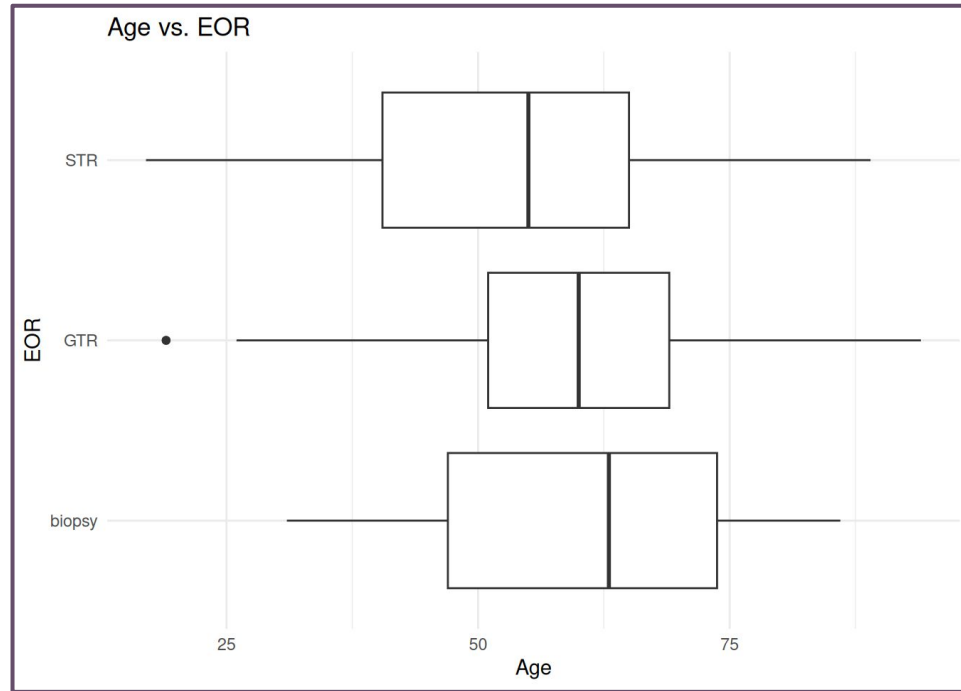
RQ1: How do IDH status and MGMT status influence overall survival in patients with gliomas?



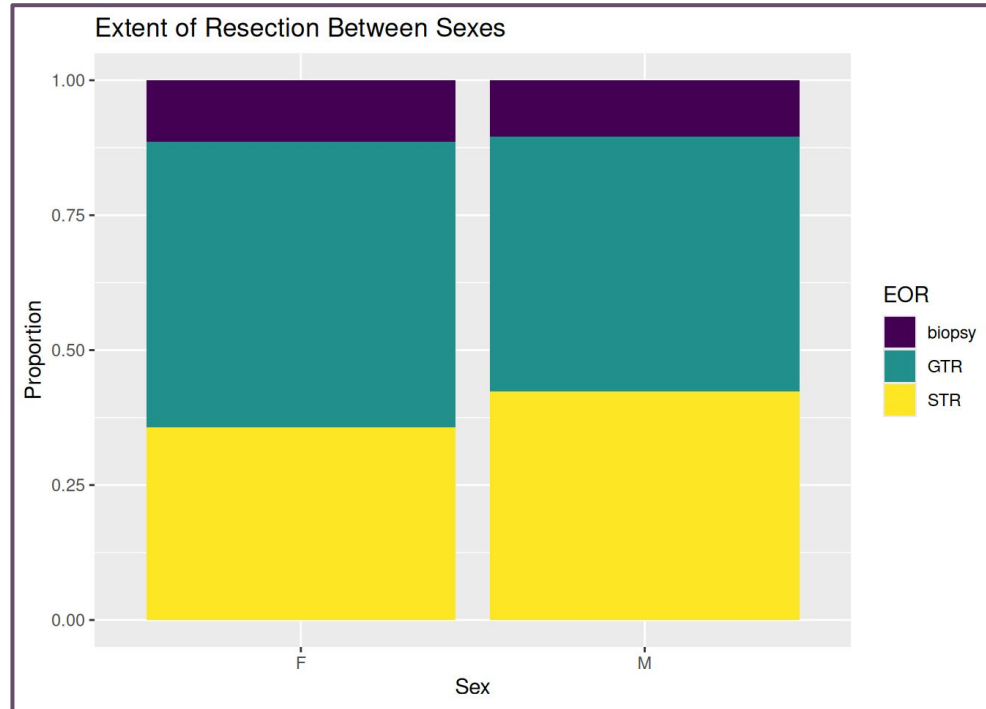
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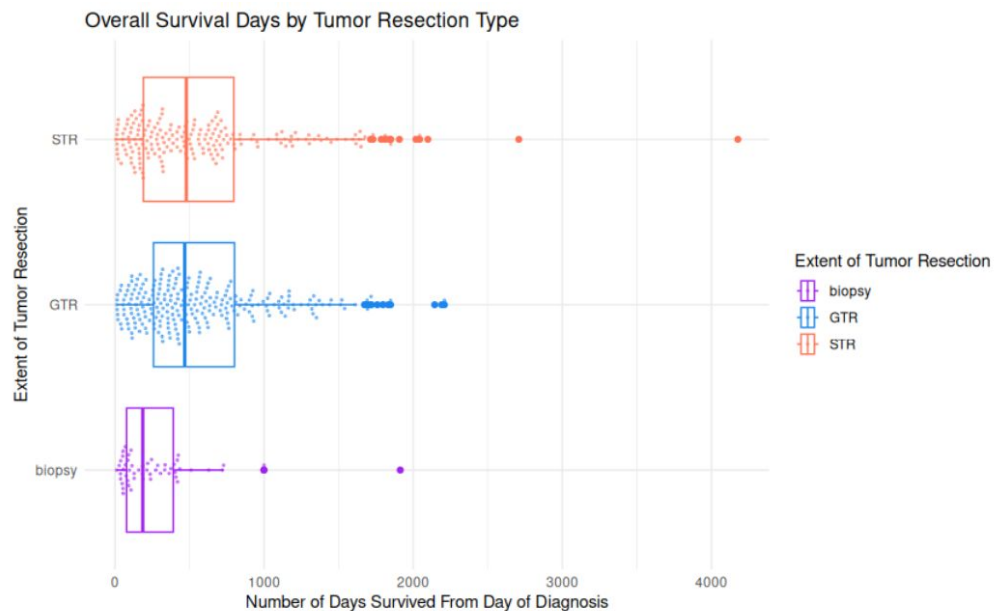
RQ2: Which factor(s) are linked with whether or not a patient receives Gross Total Resection (GTR) over other Extents of Resection (EOR)?



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RQ3: Is GTR associated with longer survival compared to STR or biopsy procedures?



Distribution of Survival Days by EOR

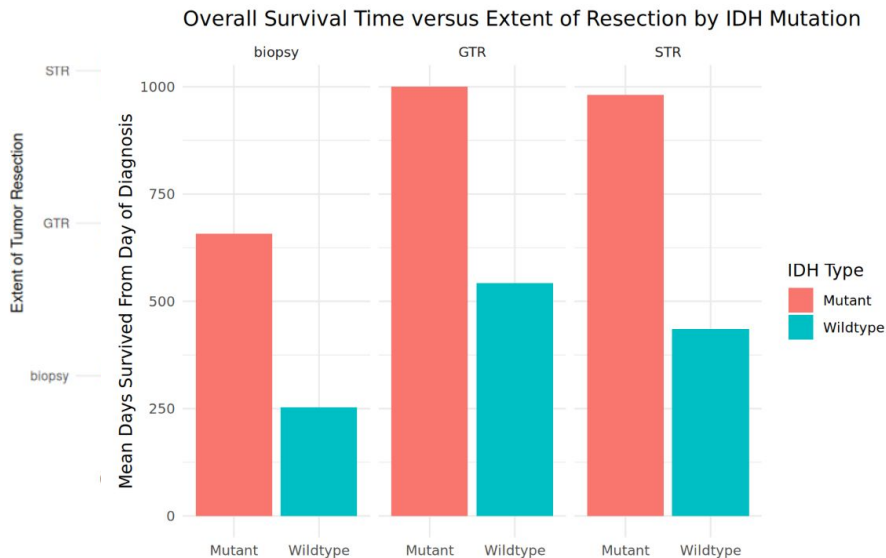
eor	Mean	Median	SD
GTR	594.641	467.5	468.776
STR	630.828	478.5	588.815
biopsy	282.685	186.0	323.274

Findings:

- STR has higher median survival time than GTR by 12 days, not clinically significant
- GTR does not appear to be associated with longer survival compared to STR

RQ3: Is GTR associated with longer survival compared to STR or biopsy procedures for different IDH gene types?

Overall Survival Days by Tumor Resection Type



Mean Overall Days Survived For IDH Mutant vs Wildtype By EOR

eor	Mutant	Wildtype
GTR	1000.179	543.0273
STR	980.662	435.2520
biopsy	657.500	252.7000

Findings:

- For IDH-mutant patients (less aggressive cancer), GTR vs STR do not differ significantly in mean survival days
- However, for IDH-wild type patients (more aggressive cancer), GTR patients lived 3.5 months longer than STR patients
 - 25% increase in lifespan
- For glioma patients with an aggressive IDH-wild type, the most extensive type of resection (GTR) is extremely influential in extending the lifespan of a glioma patient

Conclusion

- IDH enzyme type: relationship with longevity of survival
 - IDH mutant correlates with longer survival than IDH wild type
 - Pattern reinforced by Kaplan-Meier curve
- MGMT promoter methylation: relationship with length of survival
 - Positive MGMT promoter methylation correlated with longer survival time
- Extent of resection (EOR): no relationship with age or survival
 - Yielded relationship when stratified by IDH enzyme type
- Overall, EOR does not significantly affect survival time
 - But in IDH-wild type patients: GTR is associated with longer survival
- Limitations:
 - Limited generalizability → all data comes from a singular medical center
 - Limited to descriptive tests only → claims about statistical significance invalid
 - Analyses did not utilize data from patients that are still living
 - Purely observational data → cannot conclude causation