The Impact of Medicaid Expansion on Intracranial Meningioma Incidence

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Introduction and Objectives

Intracranial meningiomas are the most common primary CNS tumor and can pose significant morbidity if large or malignant.^{1,2} Prior literature shows that non-White or lower socioeconomic status (SES) patients tend to have later diagnoses and present with more serious disease.^{3,4} The Affordable Care Act (ACA) has increased access to healthcare, allowing for earlier diagnosis and management of many conditions.^{5,6}

Objectives:

- Determine if Medicaid expansion was associated with a change in incidence rates of intracranial meningiomas.
- Determine if Medicaid expansion was associated with a change in incidence rates among subgroups of race, county SES, and tumor behavior.

Materials and Methods

Population: The Surveillance, Epidemiology, and End Results (SEER) database was used to conduct a difference-in-difference (DID) analysis between 2010-2019.

Intervention and outcomes: Determine if there is a change in incidence rates between counties that adopted Medicaid expansion (intervention group) to those that did not (control group). States that adopted during intervention period were excluded.

Analysis: Subgroup analysis by race, county SES (>25% under 150% federal poverty level), tumor behavior based on ICD-10 behavior codes, where "borderline malignant" and "malignant" codes were characterized as high-grade.

Results

- There were 161,479 intracranial meningioma cases across 1,021 counties between 2010-2019.
- Key findings:
 - Increased detection of more aggressive tumors:
 - High grade tumors: 18% relative increase (p<0.001).
- Impact on social determinants of health:
- Black populations: 4% relative increase (p<0.001).
- White populations: 7% relative decrease (p<0.001)
- Lower socioeconomic status populations: 8% relative increase (p<0.001).
- No impact on overall incidence (p=0.091).
- Event plot (Fig 1): results are not due to pre-existing differences between groups.

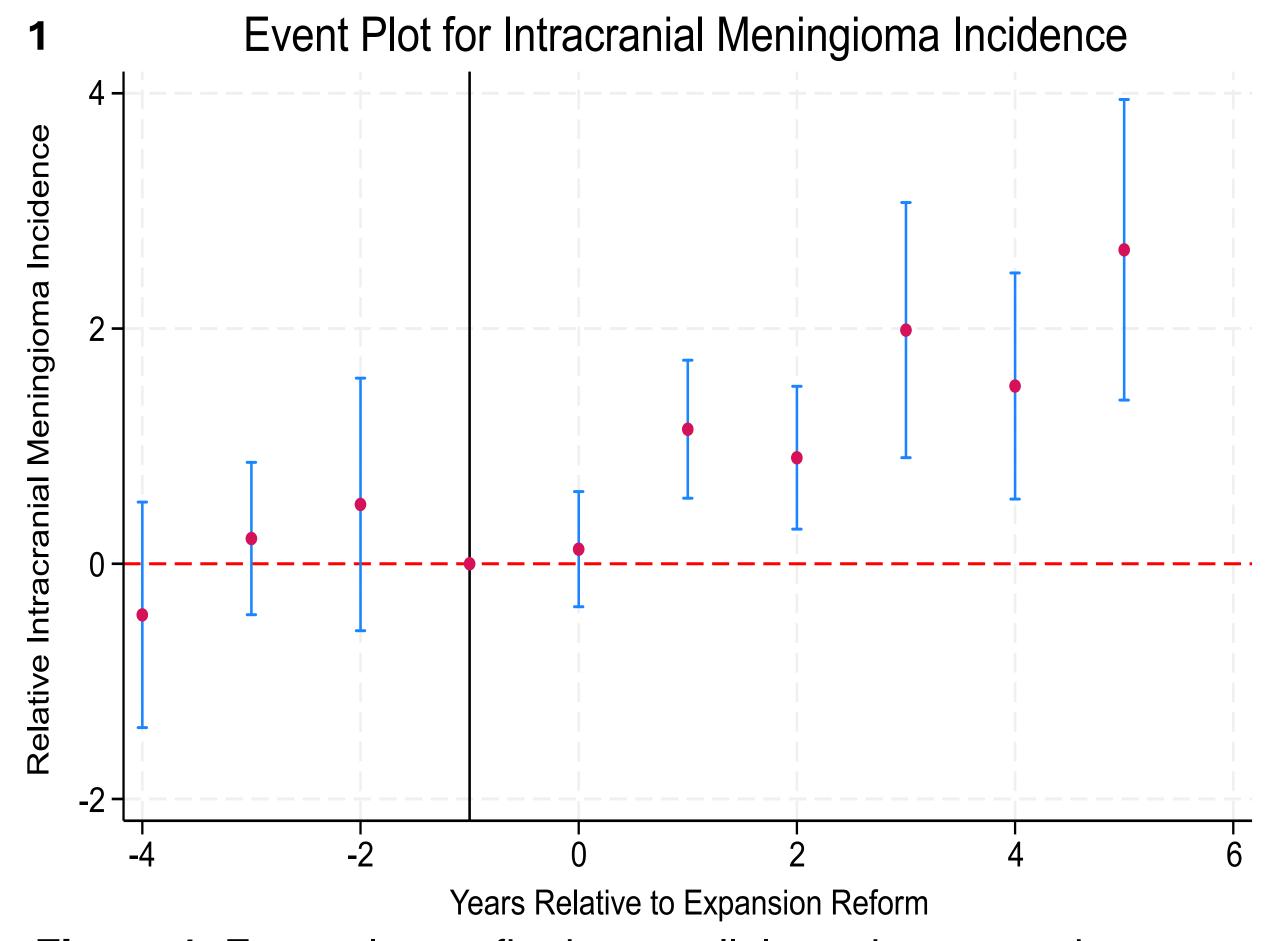


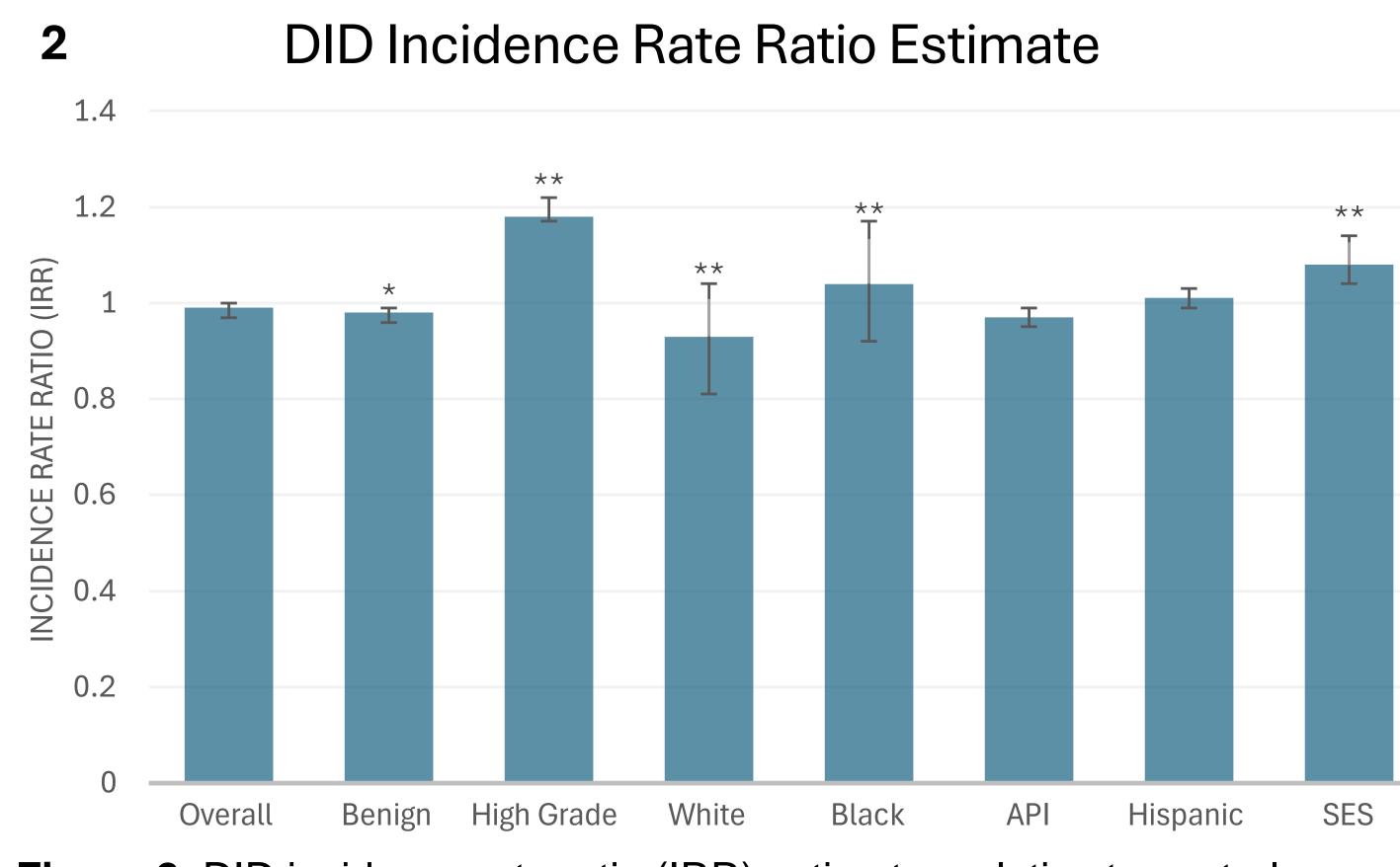
Figure 1. Event plot confirming parallel trends assumption.

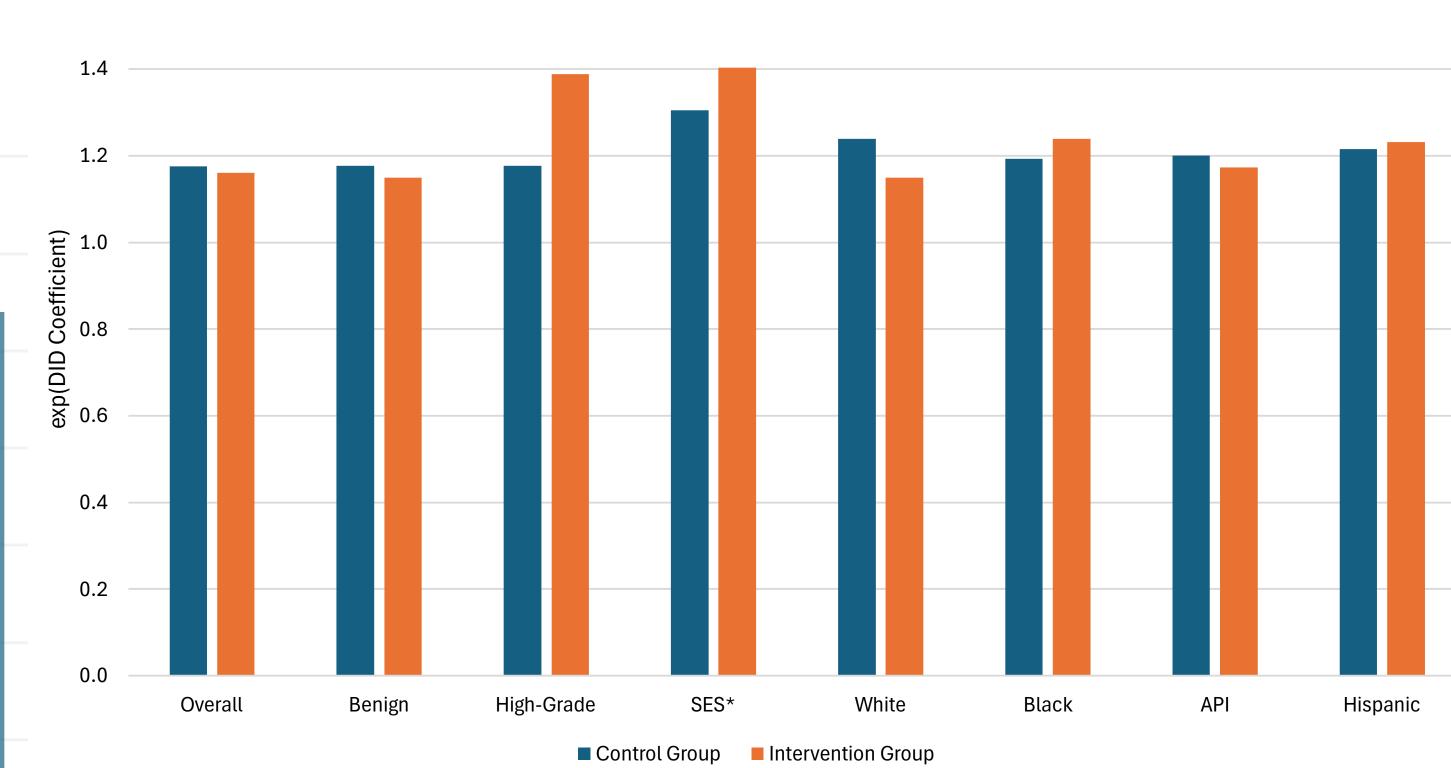
Discussion

This study found an increase in relative incidence of high-grade intracranial meningiomas after Medicaid expansion. The ACA increased access to care for the more aggressive forms of meningioma without increasing the overall incidence of detection. This may also represent potential cost-savings associated with the ACA, as these severe cases are now more likely to receive appropriate treatment earlier in the disease course, where there is an increased chance for curative treatment.

Subgroup analysis demonstrated an increased relative incidence among Black and lower SES populations. Given that these populations are more likely to go undiagnosed for longer periods due to social determinants of health, this result indicates improved access to care for these underserved communities. White populations experienced a decreased relative incidence, perhaps because they are less likely to be impacted by social determinants of health and tend to have better healthcare access and outcomes.^{3,7}

The analysis showed that there was no impact by the ACA on overall meningioma incidence. While many tumors – particularly malignant ones – have seen an increase in incidence following the ACA, previous studies have indicated that meningioma incidence rates have mostly stabilized in the recent decade following a massive rise due to improved imaging capabilities and access in the early 2000s.8 While our results concur that benign meningioma incidence has remained relatively stable, this is not true for malignant forms.





DID Incidence Multipliers Post-Expansion

Figure 3. DID-determined incidence multipliers for 2014-2019.

8. Bhala S, Stewart DR, Kennerley V, et al. Incidence of Benign Meningiomas in the United States: Current and Future Trends. JNCI Cancer Spectr. 2021;5(3): pkab035. doi: 10.1093/jncics/pkab035

Figure 2. DID incidence rate ratio (IRR) estimates relative to control group. *p<0.05. **p<0.001

Incidence	Control Group, Before Expansion	Control Group, After Expansion	Intervention Group, Before Expansion	Intervention Group, After Expansion	DID Incidence Rate Ratio Estimate (95% CI)	P-Value
Overall	9.02	11.36	10.05	11.75	0.99 (0.97-1.00)	0.091
Benign, All	8.65	10.90	9.51	11.05	0.98 (0.96-0.99)	0.002
Benign, Microscopic	3.10	3.10	3.53	3.56	1.02 (1.01-1.04)	0.003
High-Grade, All	0.38	0.46	0.55	0.70	1.18 (1.06-1.29)	<0.001
High-Grade, Microscopic	0.34	0.42	0.52	0.67	1.18 (1.06-1.31)	<0.001
White	11.46	14.70	12.76	14.84	0.93 (0.91-0.95)	<0.001
Black	9.30	11.64	10.24	12.12	1.04 (1.02-1.06)	<0.001
Asian and Pacific Islander	6.27	8.25	8.18	9.74	0.97 (0.93-1.03)	0.408
Hispanic	5.20	6.56	5.04	6.47	1.01 (0.99-1.03)	0.192
Low Socioeconomic Status	8.94	10.52	8.94	10.11	1.08 (1.04-1.11)	<0.001

Table 1. Incidence per 100,000 people and incidence rate ratio. DID: difference-in-difference

Conclusions

Medicaid expansion was associated with a relative increase in incidence of high-grade intracranial meningiomas. Expansion was also associated with a relative increase in incidence for Black and lower socioeconomic status populations. Expansion was not associated with a change in overall incidence. These findings demonstrate the impact of Medicaid expansion on increased access to care, particularly for the most cost-intensive and aggressive forms of intracranial meningioma.