Epilepsy Surgery Trends in the United States from 1990 to 2008

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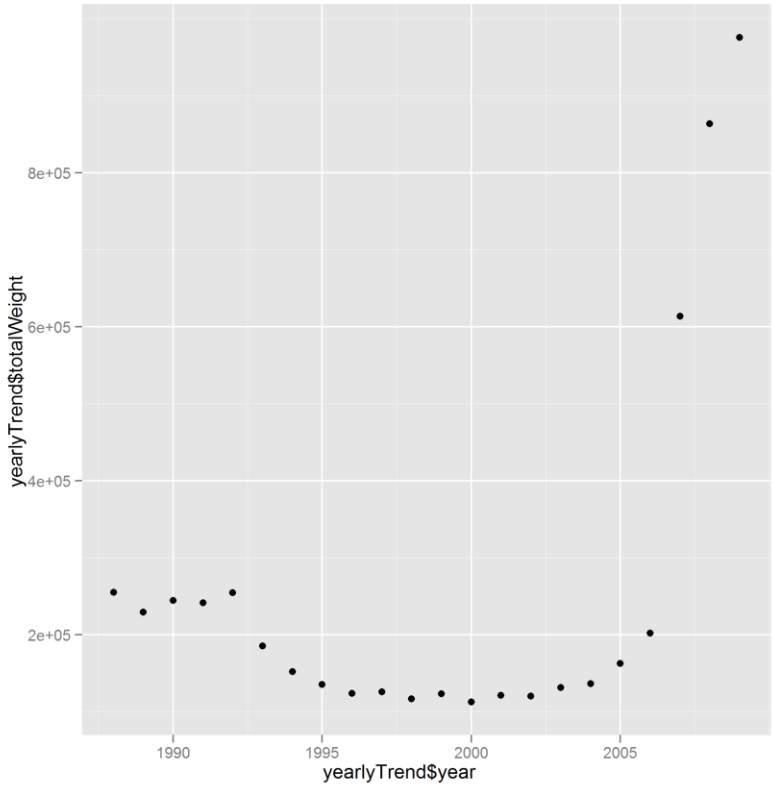
Introduction

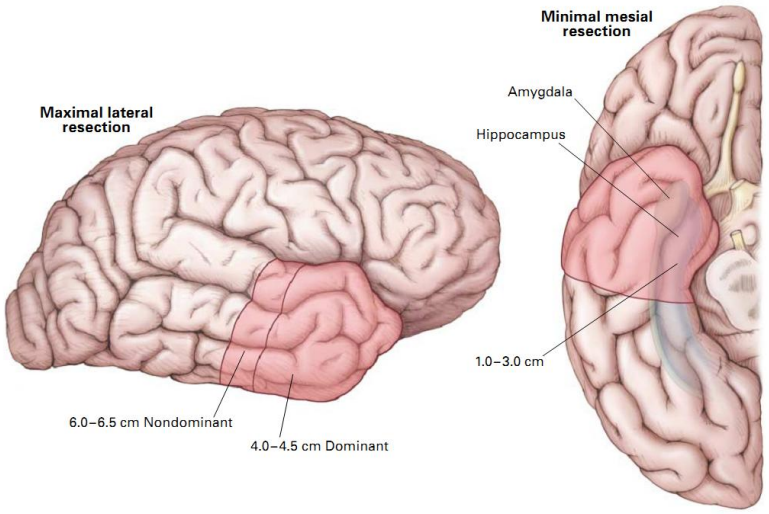
Medically refractory epilepsy is a common, highly morbid disease



- epilepsy affects between 5 – 10 per 1000 and accounts for 1% of the global burden of disease based on disability-adjusted life-years (DALYs)
- pharmacotherapy is unsuccessful in controlling seizures in 20% to 40% of patients.

Background

Anterior temporal lobectomy has been validated as a treatment for temporal lobe epilepsy



- In 1993, it was estimated 1,500 out of 100,000 eligible surgical candidates received surgery for temporal lobe epilepsy.

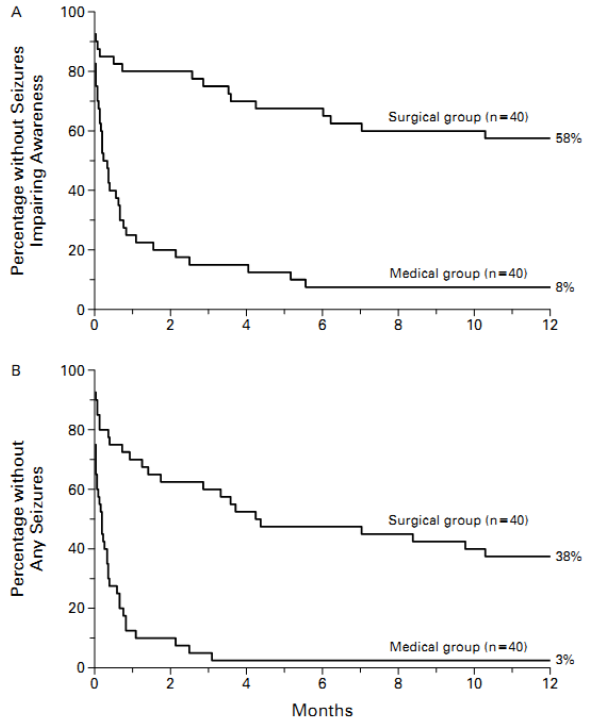


Figure 2. Kaplan–Meier Event-free Survival Curves Comparing the Cumulative Percentages of Patients in the Two Groups Who Were Free of Seizures Impairing Awareness (Complex Partial or Generalized Seizures) (Panel A) and Free of All Seizures (Including Auras) (Panel B).

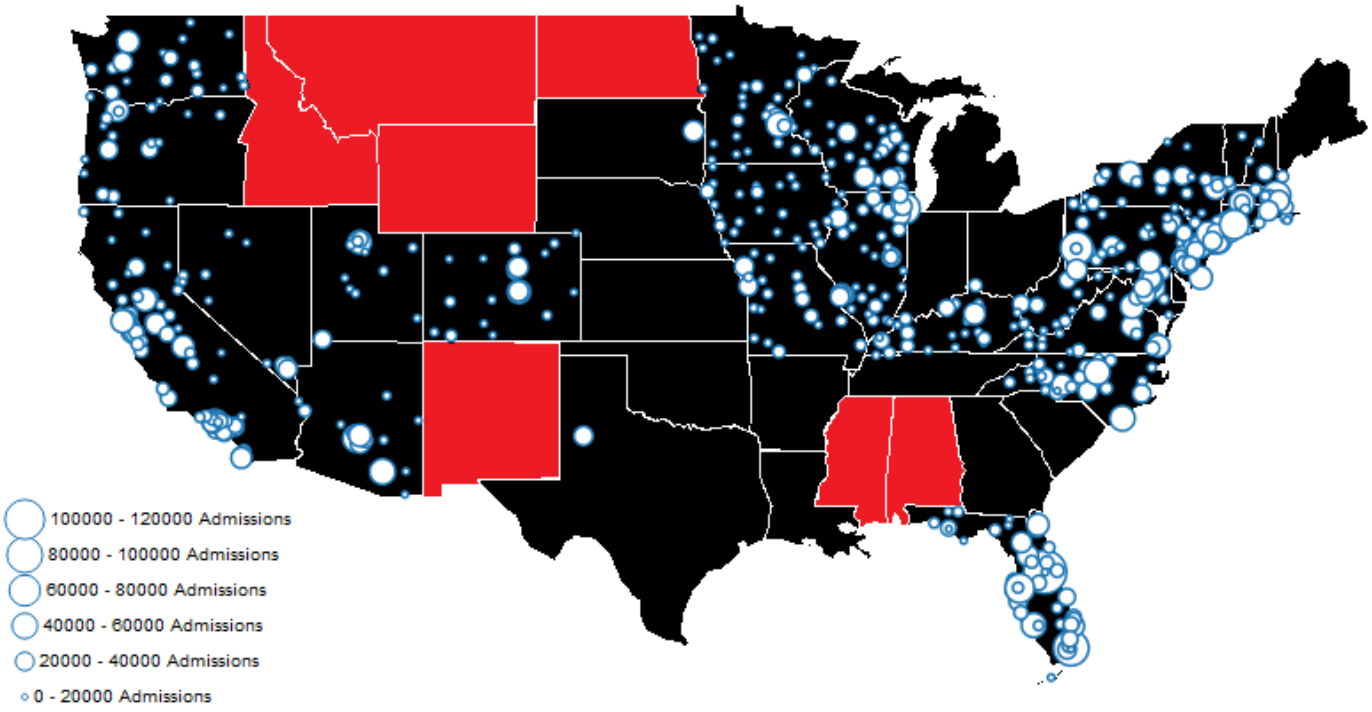
In both analyses, more patients in the surgical group were free of seizures ($P<0.001$ by the log-rank test). Follow-up began 1 day after surgery in the surgical group and 25 days after randomization in the medical group.

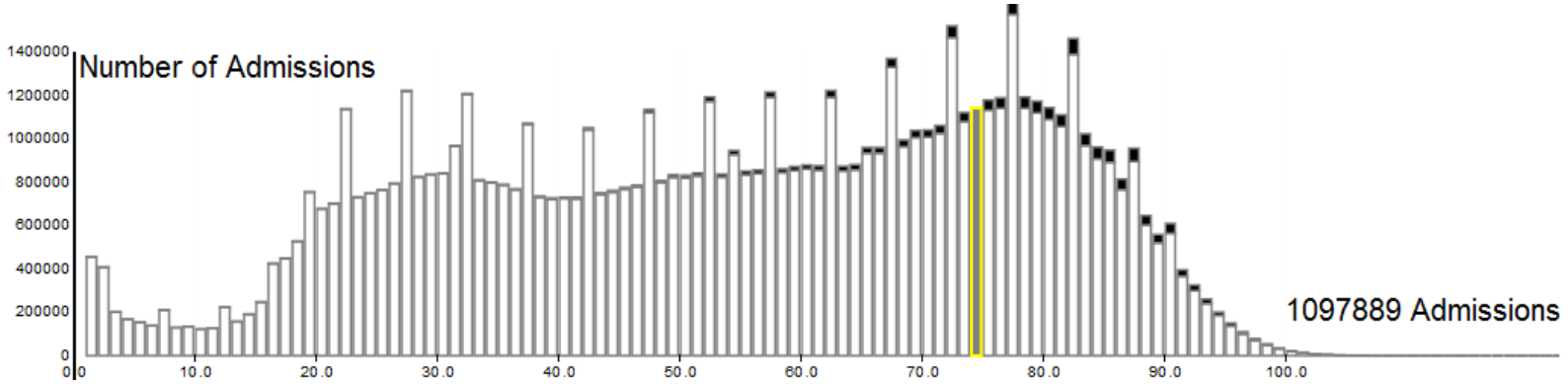
Research Question

Has the use of lobectomy for patients with intractable epilepsy expanded in light of class I clinical evidence demonstrating efficacy?

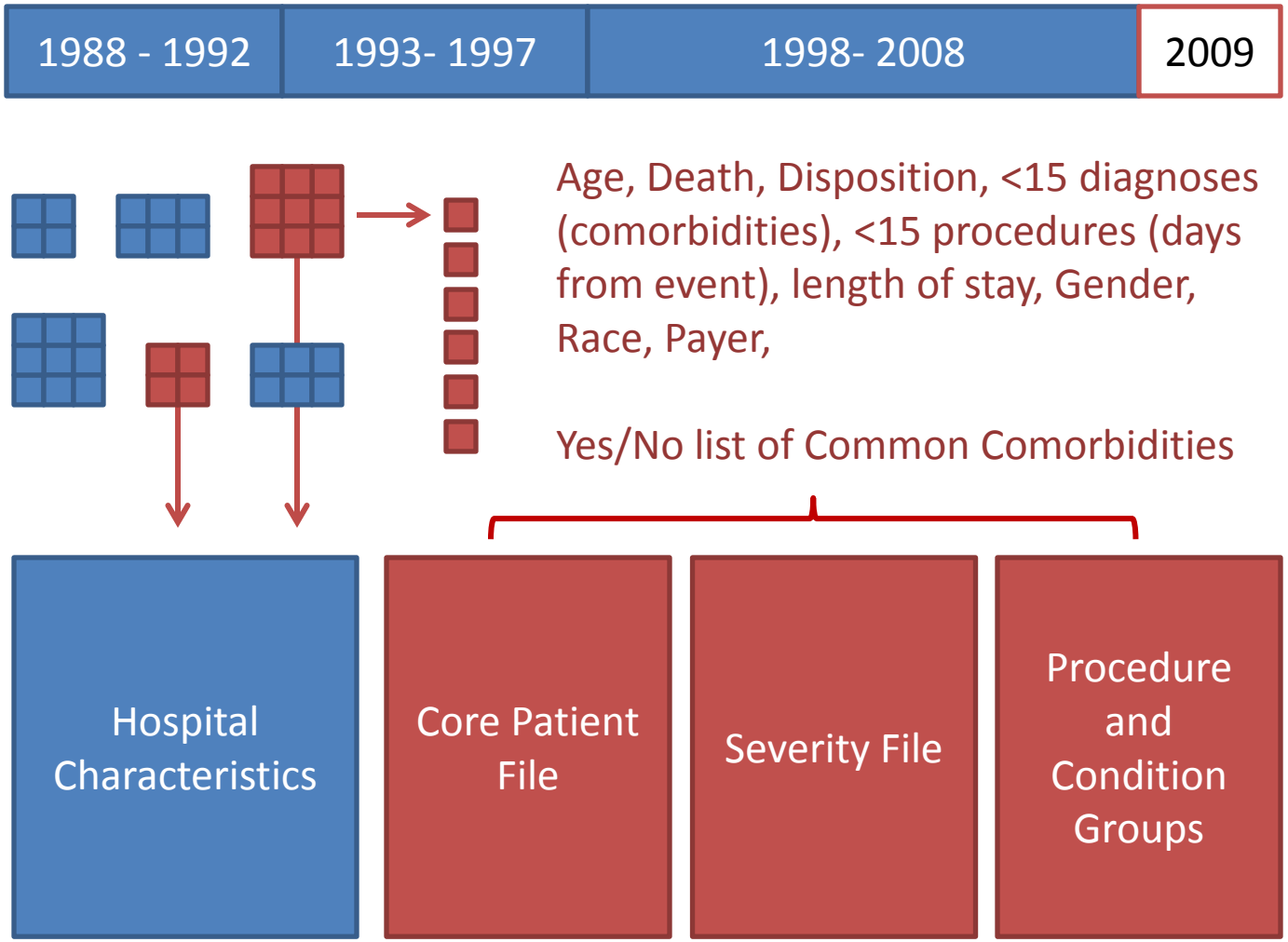
Methods

The National Inpatient Survey is a stratified sample of inpatient admissions of US hospitals



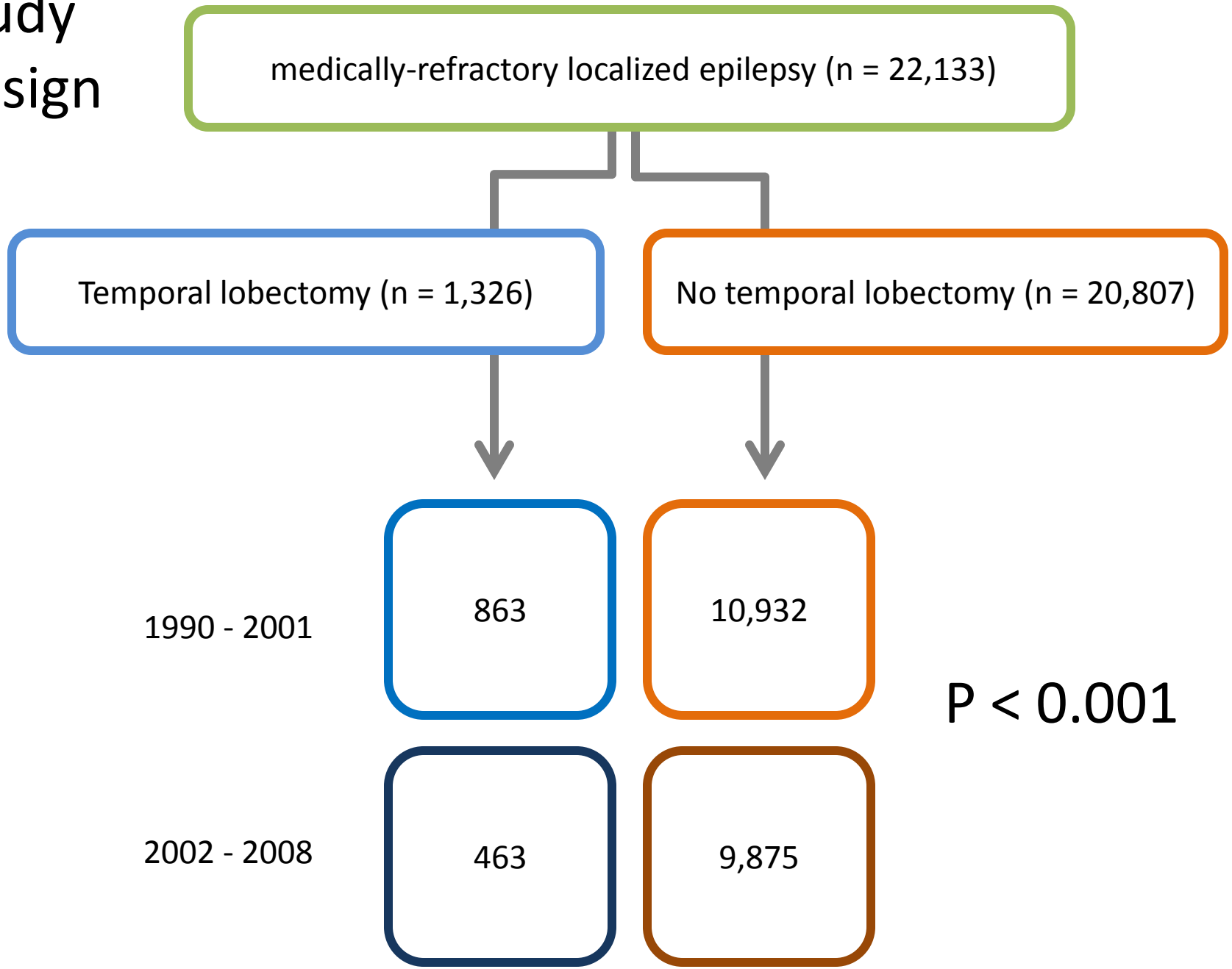


Structure of the Data



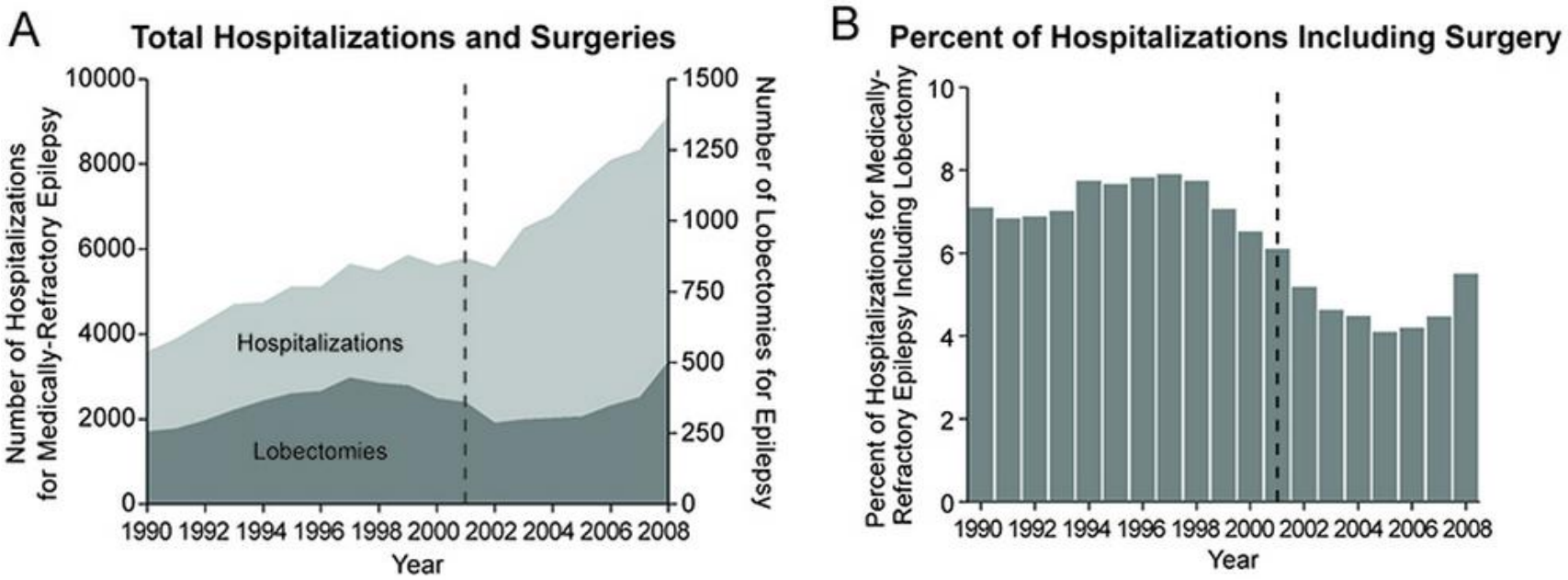
Hospital Name, Address, Bed Size, Teaching Status, Rural/urban, total number of discharges, RN FTEs

Study Design

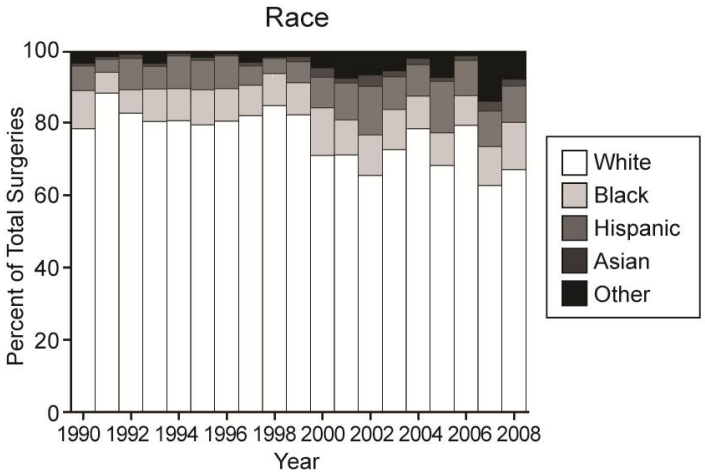


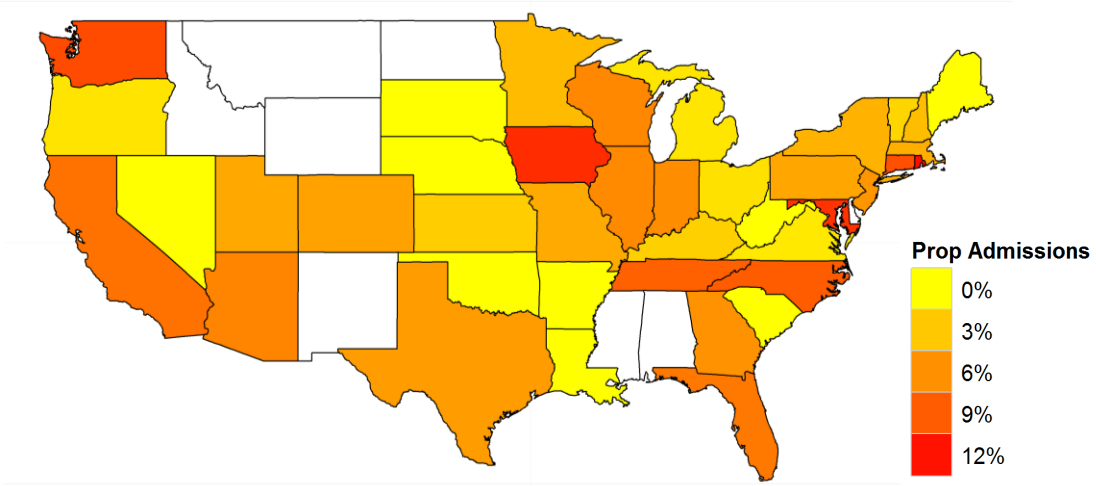
Results

The use of lobectomy for medically intractable epilepsy has not increased between 1990 – 2008.



There exists regional, payer, race, and hospital status based disparity in the utilization of lobectomy





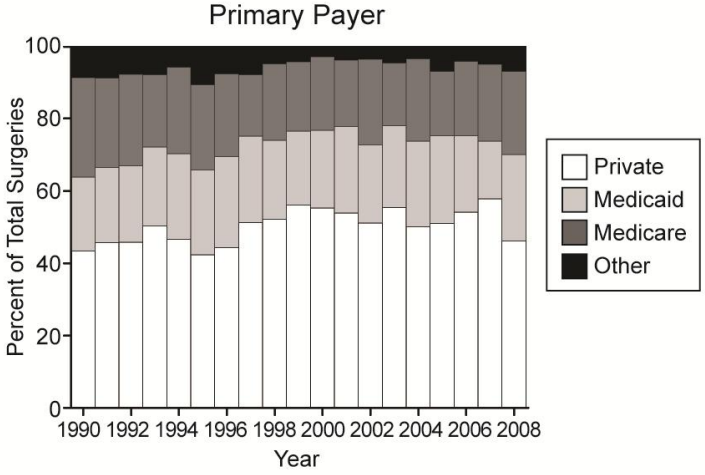


Table 2: Predictors of ATL during TLE admission from multivariate analysis

	Odds ratio	95% CI	*P* value
Pediatric (age < 18 y)	1.57	1.30 – 1.89	< 0.001*
White race	1.56	1.28 – 1.90	< 0.001*
Income above 25th percentile	1.02	0.84 – 1.25	0.83
Private insurance	1.73	1.47 – 2.03	< 0.001*
Large hospital	1.51	1.26 – 1.82	< 0.001*
Teaching hospital	1.88	1.51 – 2.34	< 0.001*
Urban hospital	1.12	0.72 – 1.75	0.62
Hospital in South or West	1.74	1.49 – 2.03	< 0.001*

There exists statistically significant differences in likelihood of receiving lobectomy and risk of adverse events based on hospital volume

Table: Peri-operative adverse events by center volume

	Low	Middle	High
Stroke/neurological complication	14 (3.8)	33 (1.8)	55 (1.3)
Post-operative infection	10 (2.5)	66 (3.5)	86 (2.0)
Hematoma	10 (2.5)	28 (1.5)	40 (0.9)
Status epilepticus	5 (1.3)	9 (0.5)	10 (0.2)
Ventriculostomy/ Hydrocephalus	0 (0)	9 (0.5)	5 (0.1)
Pulmonary complication	10 (2.5)	28 (1.5)	40 (0.9)
Cardiac complication	0 (0)	5 (0.3)	5 (0.1)
Deep venous thrombosis/Pulmonary embolism	0 (0)	5 (0.3)	20 (0.5)
Death	0 (0)	5 (0.3)	0 (0)
Total	48 (12.5)	190 (10.1)	262 (6.1)

Data are N (%) of each event within each group of centers, 1990-2008.

$X^2 = 13.6$, $p = 0.0002$

(MAKE A GRAPH)

However, we found that the rate of lobectomy at the 20 highest-volume epilepsy centers remained constant over the study period.

decreased admissions of uncontrolled focal epilepsy patients to high-volume epilepsy centers

increased admissions to low-volume hospitals that were considerably less likely to perform the procedure.

Conclusions

- Lobectomy for medically intractable epilepsy is still underutilized, particularly among racial minorities and the underinsured.
- Patients with medically-refractory epilepsy should be referred to a comprehensive epilepsy center for surgical evaluation by an experienced epilepsy treatment team.

Acknowledgements

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