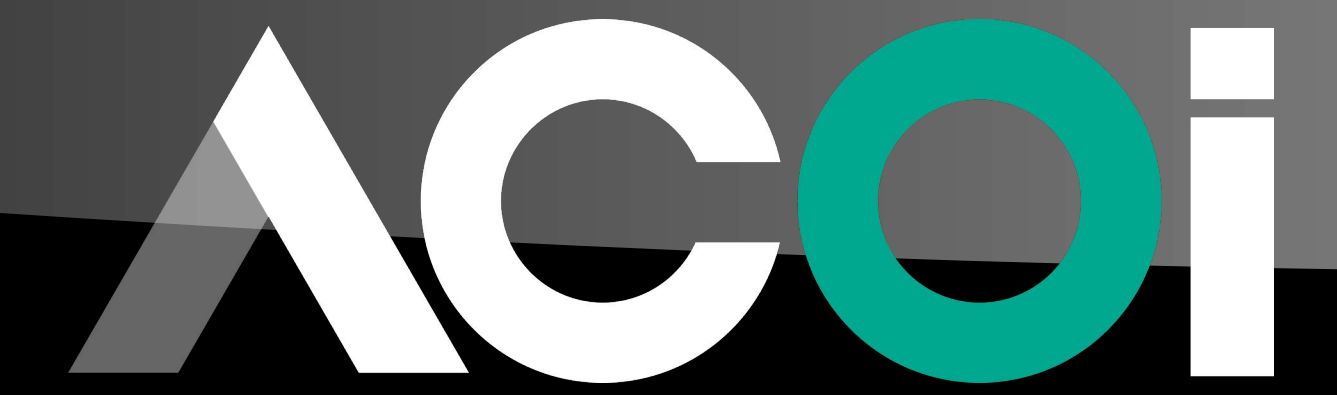


Outcomes and Disparities in Cardiothoracic Surgical Patients With and Without Major Complications or Comorbidities (MCC) During COVID-19 Hospitalizations: A National Analysis Using the NIS Database

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Introduction

- Outcomes in cardiothoracic patients are influenced by gender, viral infections, and sociodemographic factors
- Our project aimed to evaluate variables impacting survivability in patients undergoing cardiothoracic procedures with major complications/comorbidities (MCC)
- Data source: 2020 National Inpatient Sample (NIS) database

Methods

- Population: 189,540 adult hospitalizations for cardiothoracic surgery (NIS 2020)
- Statistical Analysis:
 - Length of stay (LoS) → natural-log scale
 - Dominant risk factors → weighted logistic model
 - Mortality differences → crude χ^2 tests across demographic characteristics

Results

- **COVID-19 infection:** 7.6-fold higher odds in-hospital death (OR 7.58, 95% CI 7.0-8.6)
- **Age:** Each additional decade → 17% higher odds of death
- **Socioeconomic factors:**
 - Lowest-income ZIP quartile → 16% higher odds
 - Self-pay → 26% higher odds
 - Private insurance → 25% lower odds
- **Demographics & comorbidities:**
 - Female sex protective = OR 0.83
 - Obesity protective = OR 0.78
 - Uncomplicated diabetes protective = OR 0.69
 - Complicated hypertension → slightly increased risk
- **MCC status:** Neutral effect on mortality after adjustment (OR 1.03, $p = 0.50$)
- **Crude χ^2 :** Mortality varied by most demographic, hospital, and comorbidity categories

Mortality Risk Odds Ratios

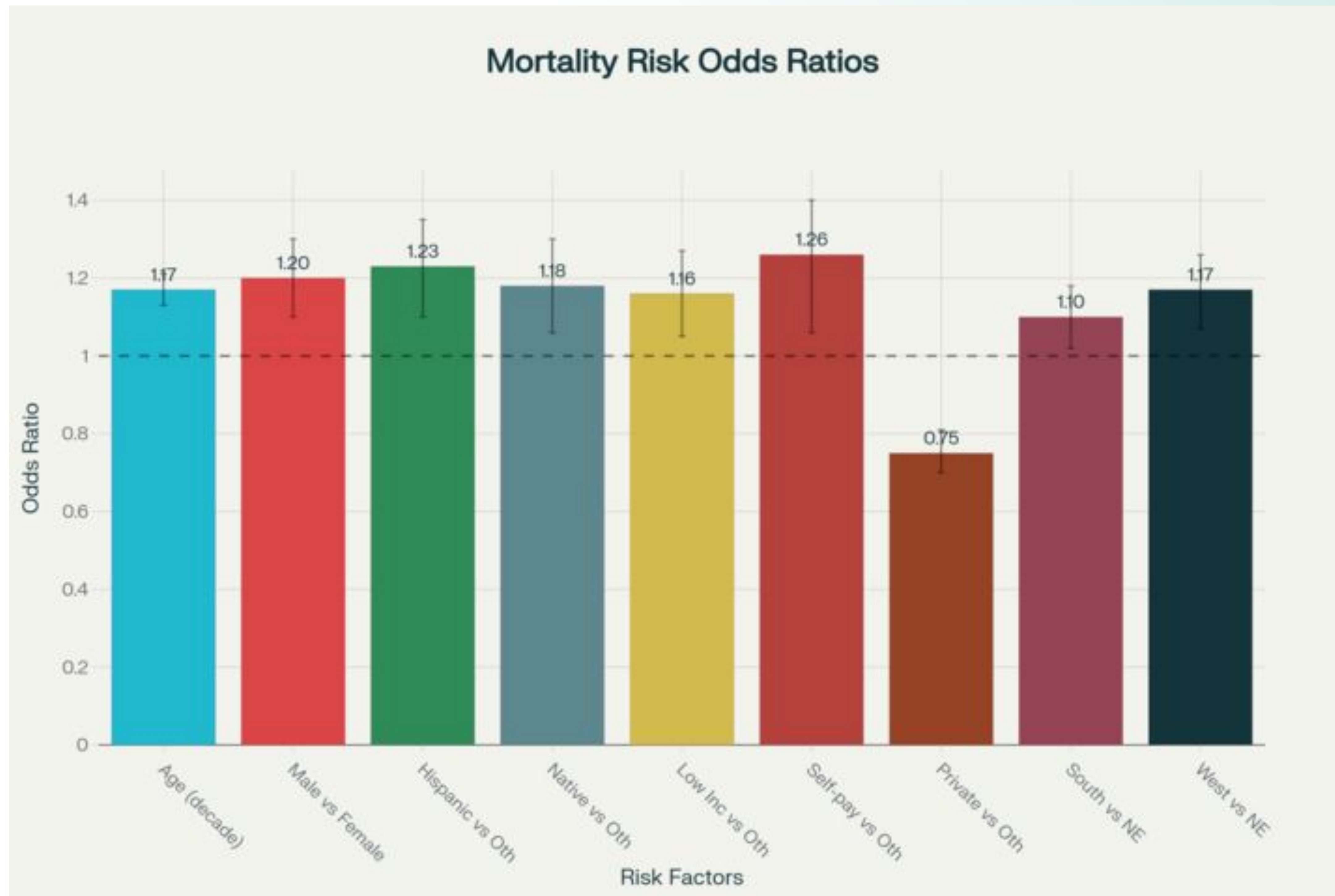


Figure 1. Bar Chart of Mortality Risks by Key Categories: The bar chart above showing the mortality odds ratio for different types of risk factors.

Variable	OR	95% CI	p-value
COVID-19 (Positive)	7.58	7.0-8.6	<0.001
Age (per decade)	1.17	1.13-1.21	<0.001
Female (vs. Male)	0.83	0.79-0.87	<0.001
Private Insurance (vs. Medicare)	0.75	0.70-0.81	<0.001
Obesity (Yes)	0.78	0.73-0.84	<0.001
HTN Complicated	1.05	(from data)	<0.05

Figure 2. Summary Table of Logistic Regression Results (Key Predictors of Mortality): The table above showing the mortality odds ratio, 95% confidence interval, and p-value for each variable.

Discussion

- COVID-19 infection and socioeconomic disadvantage were strong predictors of mortality and higher resource use
- MCC coding did not predict mortality once other variables were accounted for
- Protective associations observed with female sex, obesity, and uncomplicated diabetes suggest complex interactions in risk models
- Hospital type and pandemic status play a crucial role in outcomes beyond administrative coding

Limitations:

- Retrospective database analysis
- Selection bias → analysis limited to hospitalizations coded under cardiothoracic surgery with MCC → may not represent all cardiothoracic patients
- Pandemic-specific findings may be harder to generalize beyond 2020

Conclusion

- Pandemic status, hospital characteristics, and social determinant should be prioritized in risk adjustment for cardiothoracic surgery
- MCC remains useful for predicting resource consumption but not mortality

References:
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