

The Mitral Valve Surgery Volume-Outcome Relationship in the United States

Vinay Badhwar, MD

On behalf of co-investigators: Sreekanth Vemulapalli MD, Michael A. Mack MD, A. Marc Gillinov MD, J. Scott Rankin MD, Joseph A. Dearani MD, Maria V. Grau-Sepulveda MD MPH, Robert Habib MD, Joanna Chikwe MD, Patrick M. McCarthy, MD, Jeffrey P. Jacobs MD, Jordan P. Bloom MD, Paul A. Kurlansky, MD, Moritz C. Wyler von Ballmoos MD, Vinod H. Thourani MD, James R. Edgerton MD, Christina M. Vassileva MD, David M. Shahian MD

Disclosure Statement of Financial Interest

I, Vinay Badhwar DO NOT have a financial interest/arrangement or affiliation with one or more organizations that could be perceived as a real or apparent conflict of interest in the context of the subject of this presentation.

Management of Primary Mitral Regurgitation

- **Early surgical correction of severe primary degenerative MR is recommended provided optimal outcomes are achievable.**
- **Durable mitral valve repair is superior to replacement for primary MR**
- **The association of volume to outcome for mitral valve surgery has not been defined by contemporary national clinical data**

Objectives

- 1. Assess volume of MV repair or replacement (MVRR)**
- 2. Assess 30-day and 1 year outcomes following isolated MVRR for primary MR using national clinical data**
- 3. Define the MV surgery volume-outcome relationship at the hospital level and surgeon level**

Methods

55,311 patients with Primary MR

- **The Society of Thoracic Surgeons (STS) Adult Cardiac Surgery Database (ACSD):**
 - 1,111 hospitals, 3,137 surgeons, 50 states
 - >95% of all adult operations performed in the US
 - Routine random annual 3rd party data audits of 10%
- **Linkage to Centers for Medicare and Medicaid Services (CMS) for 1-year Outcomes**

Methods

Outcomes

- **Primary Outcome:**
 - **Operative Mortality of isolated MV surgery for primary MR**
- **Secondary Outcomes:**
 - **30-day: Composite Mortality/Morbidity (bleeding, stroke, prolonged ventilation, renal failure, wound infection)**
 - **Successful Repair Rate of primary MR (residual MR \leq mild/1+)**
 - **1-year: Mortality, Reoperation, Heart Failure Re-hospitalization**

Patient Characteristics

Lowest vs. Highest Volume Quartiles

	Lowest	Highest	P value
No Insurance	4.04%	2.35%	< 0.001
Black/Hispanic Race	14.8%	10.2%	< 0.001
Class III/IV Symptoms	31.9%	23.8%	< 0.0001
Class I Symptoms	1.8%	4.1%	< 0.0001

Overall MV Repair Rate for Primary MR

81%
(44,692/55,311)

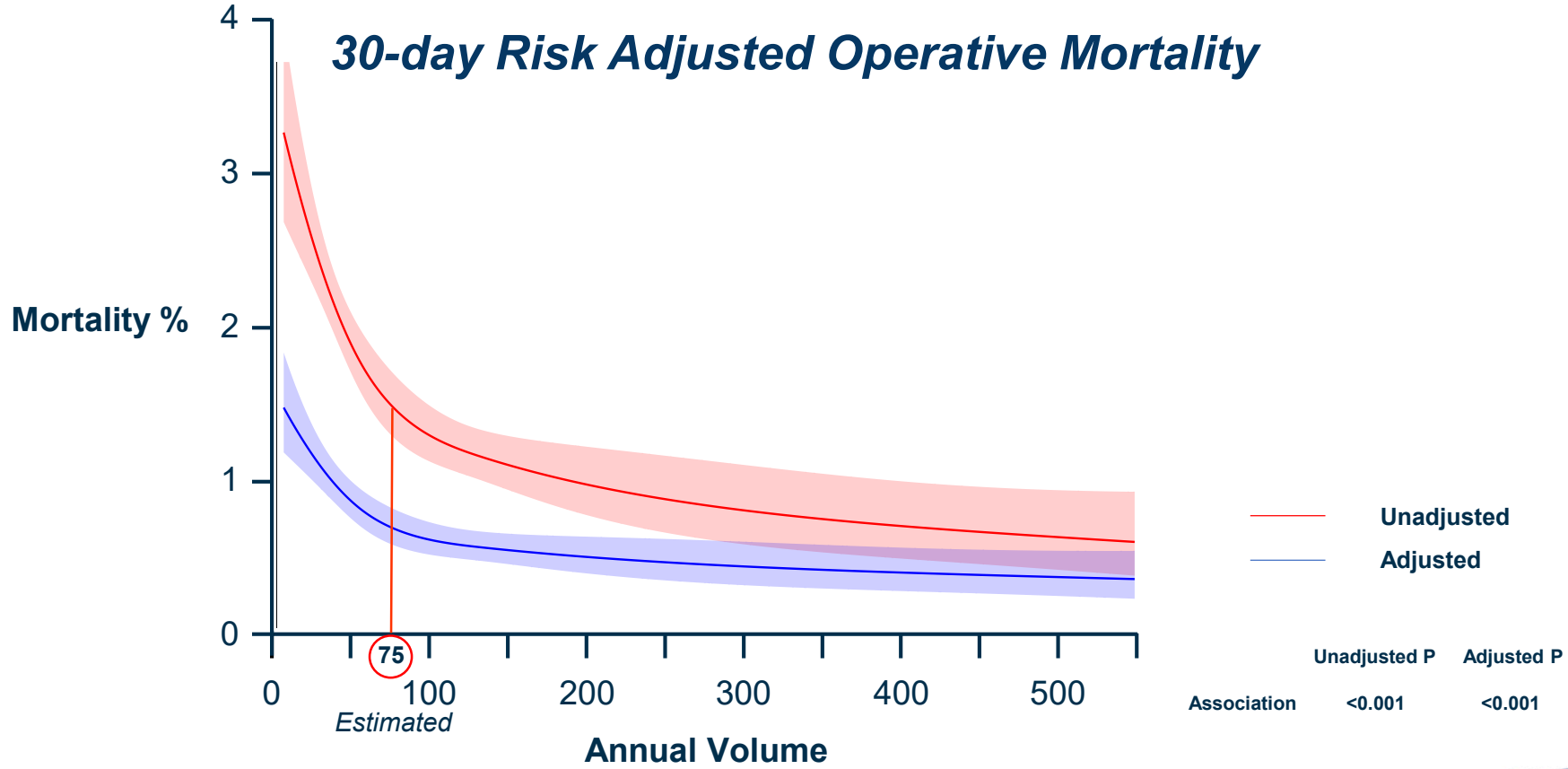
Operative Characteristics

Lowest vs. Highest Volume Quartiles

	Lowest	Highest	<i>P</i> value
MV Repair for Primary MR	63.8%	84.5%	< 0.0001
Mini or Robotic	8.0%	37.0%	< 0.001

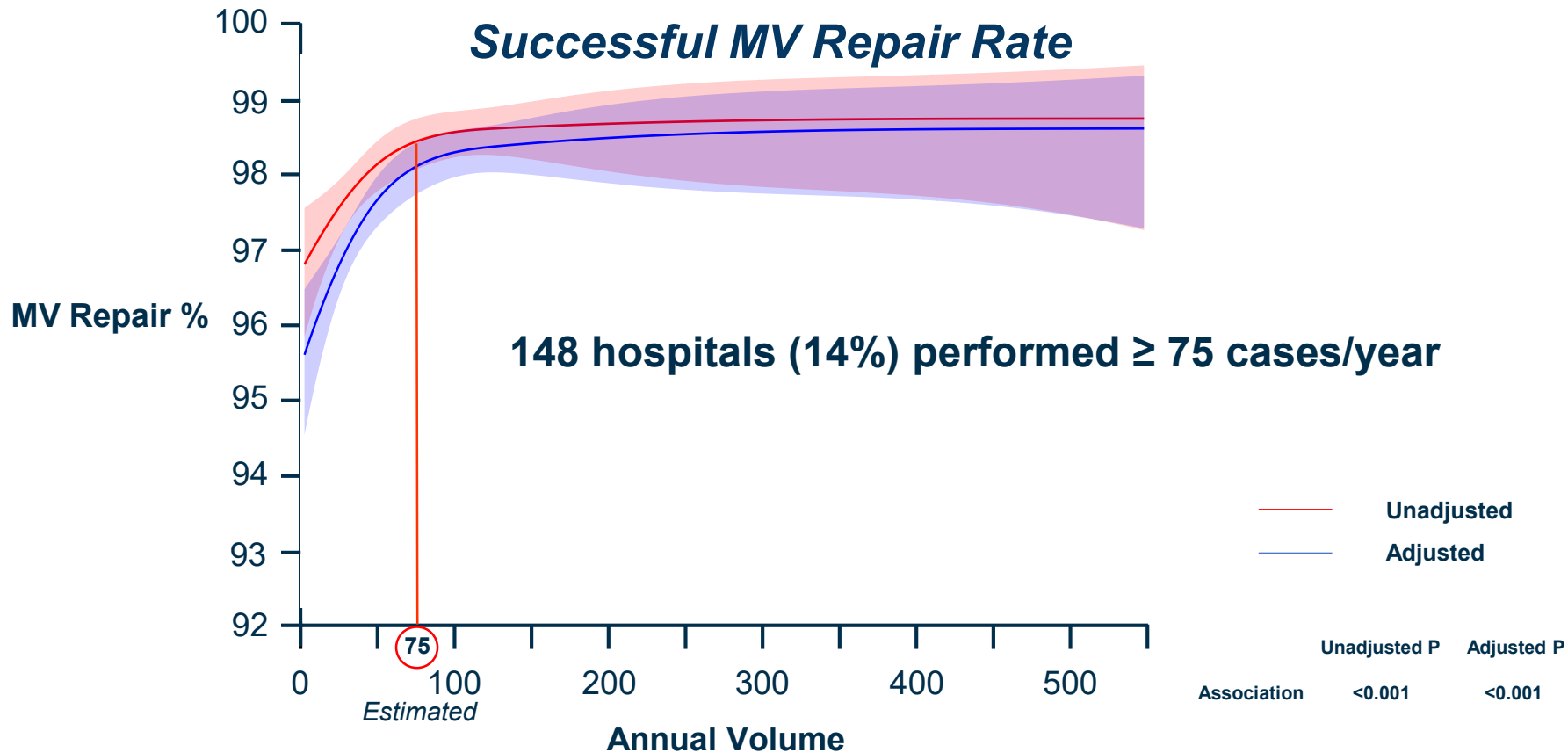
Hospital Level Outcomes

30-day Risk Adjusted Operative Mortality



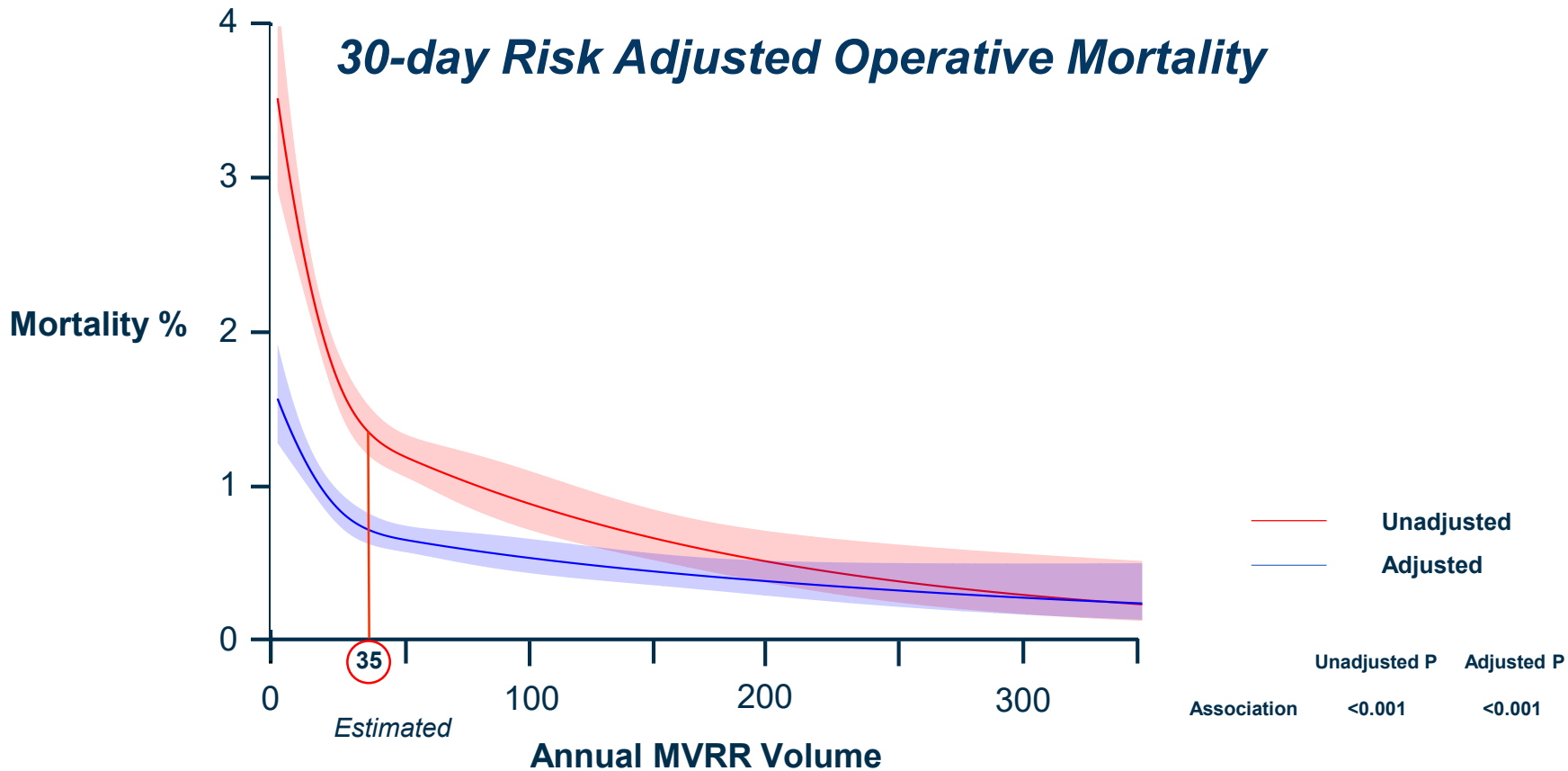
Hospital Level Outcomes

Successful MV Repair Rate



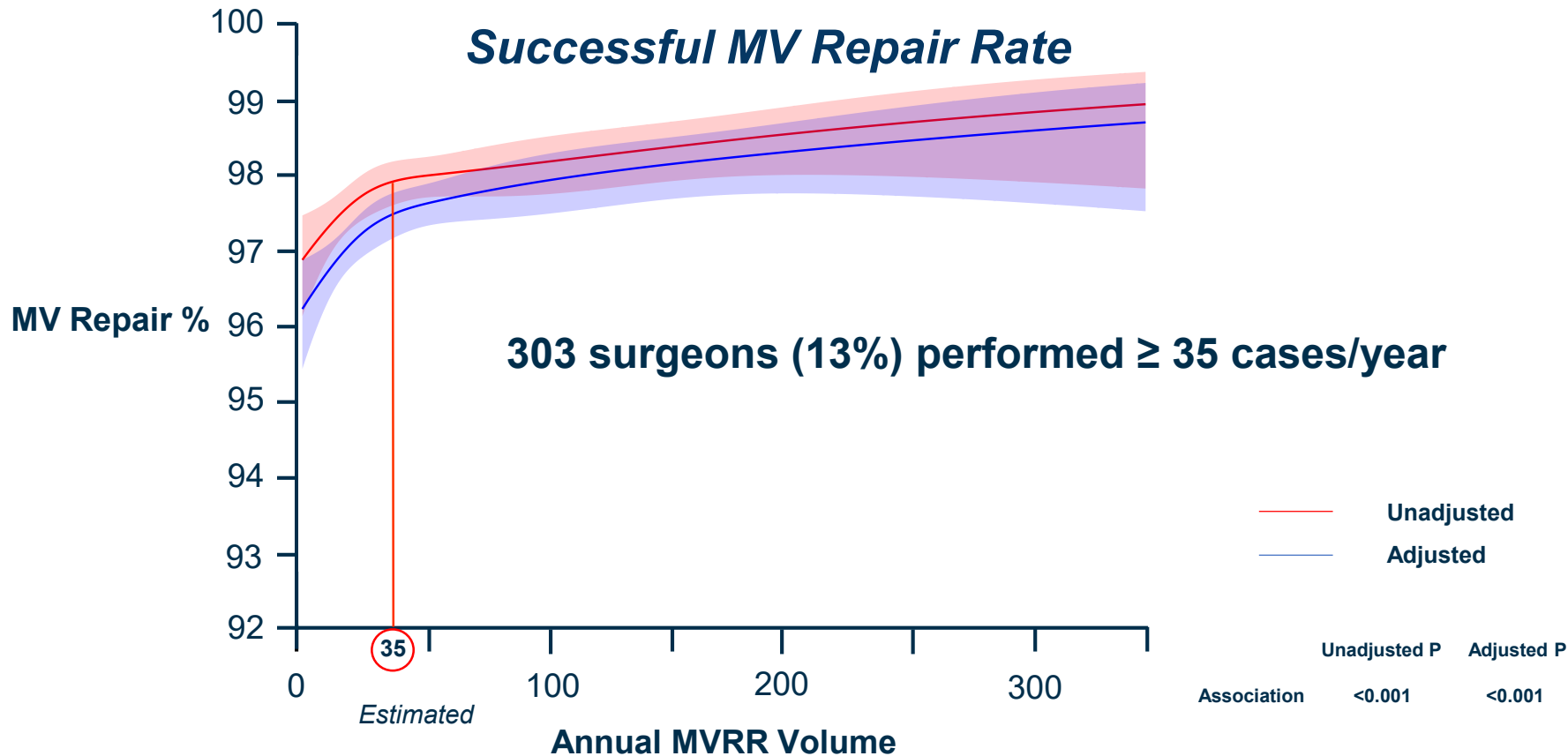
Surgeon Level Outcomes

30-day Risk Adjusted Operative Mortality



Surgeon Level Outcomes

Successful MV Repair Rate



Conclusions

National hospital level and surgeon level inverse volume-outcome relationships were identified for:

- **Successful Repair of Primary MR**
- **30-day Operative Mortality**
- **1-year Mortality**

Implications

These findings may further inform guideline-directed efforts to define access to experienced hospitals and surgeons for primary MR or complex MV disease.