

Surgical outcome and the future of perioperative medicine

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Estimate of the global volume of surgery in 2012: an assessment supporting improved health outcomes



Thomas G Weiser*, Alex B Haynes*, George Molina, Stuart R Lipsitz, Micaela M Esquivel, Tarsicio Uribe-Leitz, Rui Fu, Tej Azad, Tiffany E Chao, William R Berry, Atul A Gawande

An estimation of the global volume of surgery: a modelling strategy based on available data



Thomas G Weiser, Scott E Regenbogen, Katherine D Thompson, Alex B Haynes, Stuart R Lipsitz, William R Berry, Atul A Gawande

Lancet 2008; 372: 139-44

- **310 million surgical procedures worldwide**
- **True mortality rate is not known**

3 million deaths each year

SPECIAL ARTICLE

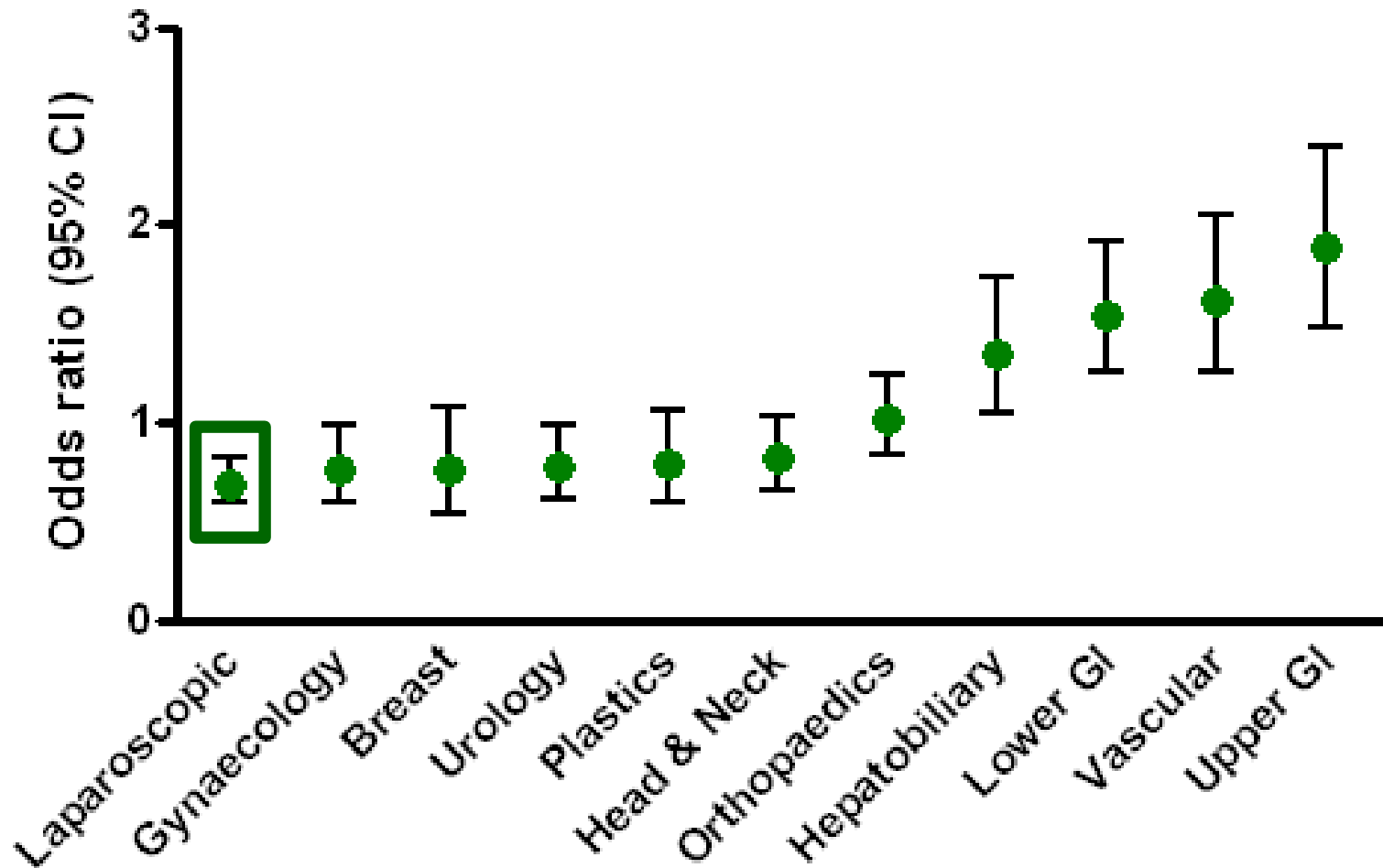
Rehospitalizations among Patients in the Medicare Fee-for-Service Program

Mortality: 2%

Adverse Events x3 – x10

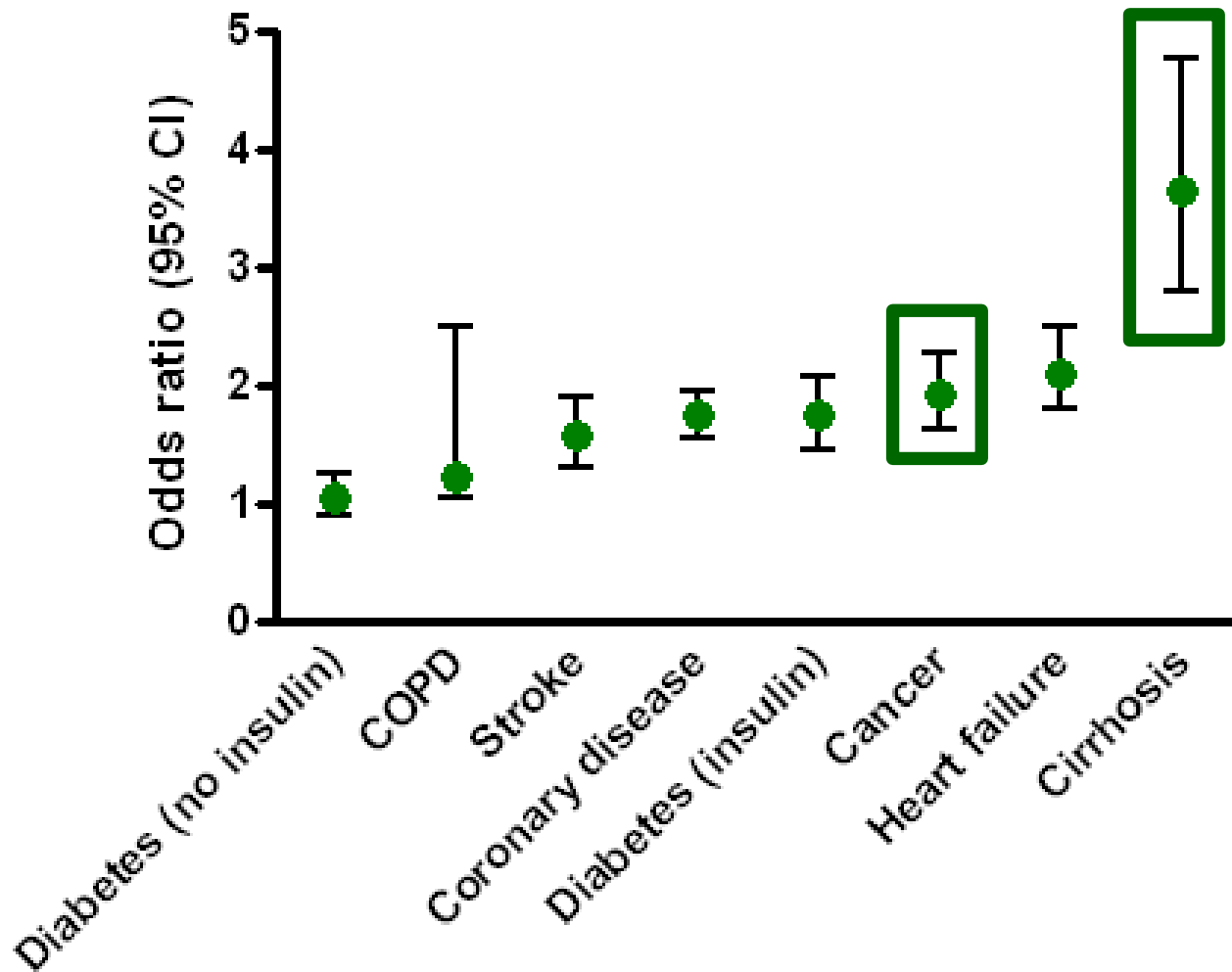
Cumulative Deaths without Rehospitalization by End of Period	
0-30 days	16,005 (2.0)
31-60 days	21,509 (2.7)
61-90 days	24,627 (3.1)
91-180 days	29,383 (3.6)
181-365 days	34,291 (4.3)

Discharge Status	Number of Patients	Percentage of Total
0-30 days	1,000,000 (69.9)	69.9%
31-60 days	1,000,000 (60.0)	60.0%
61-90 days	1,000,000 (48.5)	48.5%



Surgical procedure risk

Pearse R et al. Lancet 2012; 380: 1059-65.



Co-morbid disease risk

Pearse R et al. Lancet 2012; 380: 1059-65.



THE ROYAL
COLLEGE OF
ANAESTHETISTS

PERIOPERATIVE MEDICINE

THE PATHWAY TO BETTER SURGICAL CARE



BEFORE SURGERY

Major surgery may trigger a deterioration in long-term illness and delay patient recovery. We must use the time between the decision to perform surgery, and the procedure itself to assess the needs of individual patients, and to optimise treatment of long-term disease. There are many examples that show how we modify perioperative care to the benefit of both the patient and the healthcare system.

DURING SURGERY

Safe surgery is one of the greatest successes of modern healthcare. The challenge of care during surgery is now to improve the quality of patient care, as well as preventing medical error. The presence of an experienced anaesthetist supported by a multi-disciplinary team, provides an opportunity for the delivery of treatments which need significant medical input, without disrupting the surgical care pathway.

EARLY AFTER SURGERY

Surgeons are increasingly diversified in their technical expertise, whilst care of acute and long-term medical disease is ever more sophisticated. It is no longer realistic to expect surgeons to have an in-depth knowledge of recent advances in the management of patients with complex needs, who develop acute medical problems. Improving the quality of care early after surgery represents a major challenge.

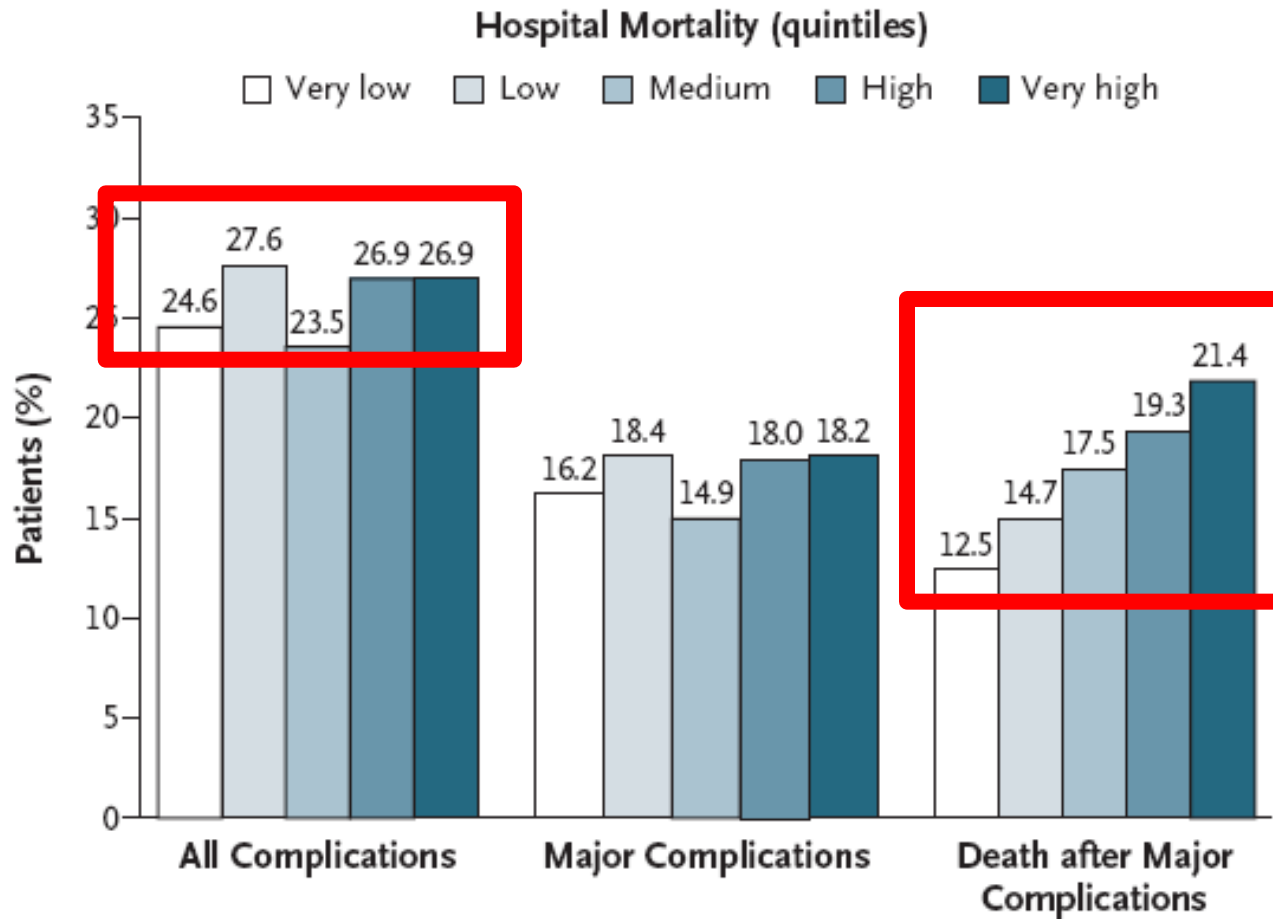
LATER AFTER SURGERY

As we work to ensure patients recover quickly and return home early after surgery, primary and secondary care services will need to work more closely together to address the needs of surgical patients with long-term disease. Even several months after they return home, complex patients need ongoing care from experts who understand the impact of major surgery on long-term health.

www.rcoa.ac.uk/periopmed/animation

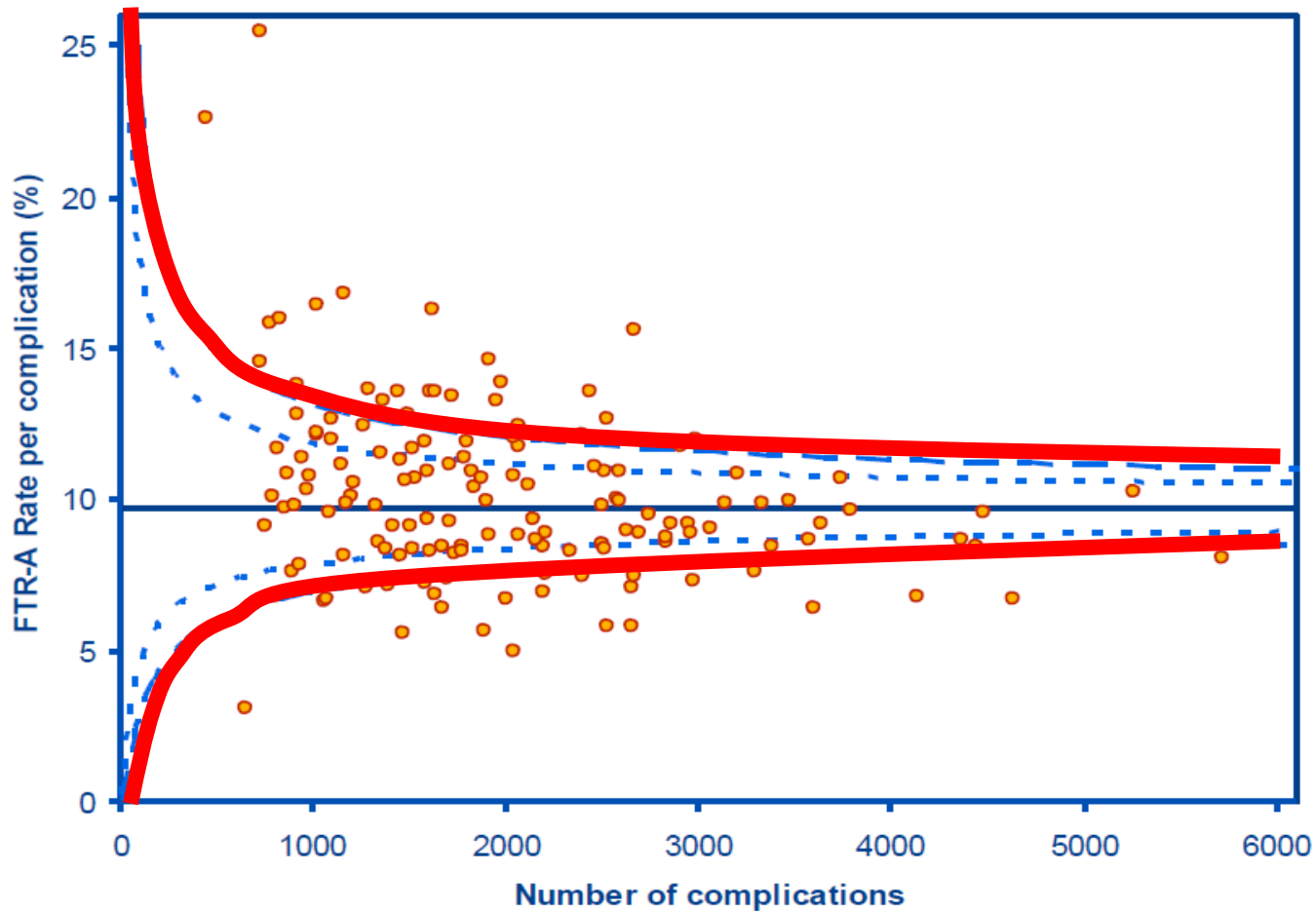


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Surgical death rates vary in US hospitals

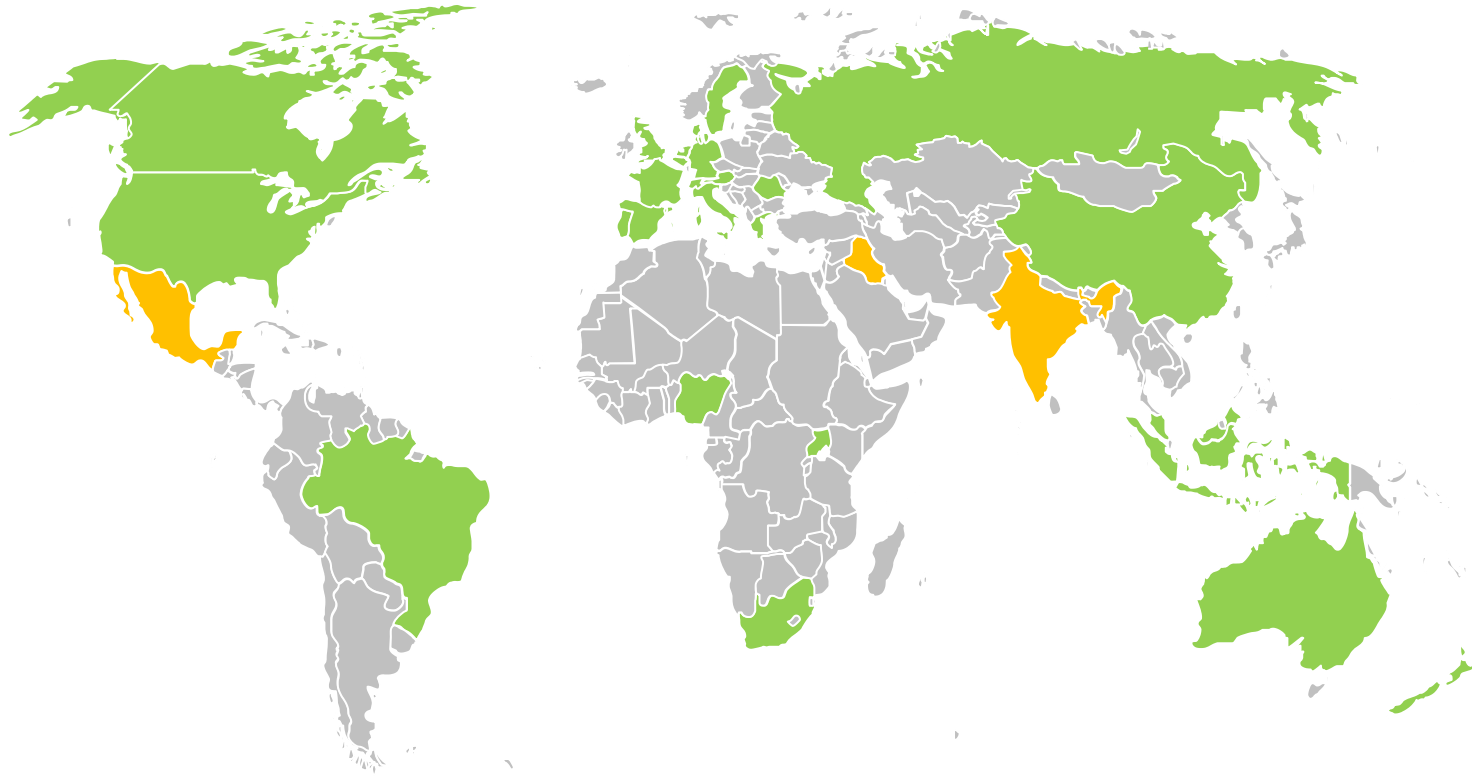
Ghaferi A. N Engl J Med 2009; 361: 1368-75.



NHS data: Failure to rescue outliers

An assessment of “failure to rescue” derived from routine NHS data.

Jones, Bottle & Griffiths; 2011



ISOS
International Surgical Outcomes Study



www.isos.org.uk
[@ISOSstudy](https://twitter.com/ISOSstudy)

ISOS: Results

- 44,814 patients from 474 hospitals in 27 countries
- Eight low & middle income countries (134 hospitals)
- 310 university hospitals (66%)
- Ward beds: median 550 (IQR 329-850)
- Critical Care beds: median 21 (10-38)

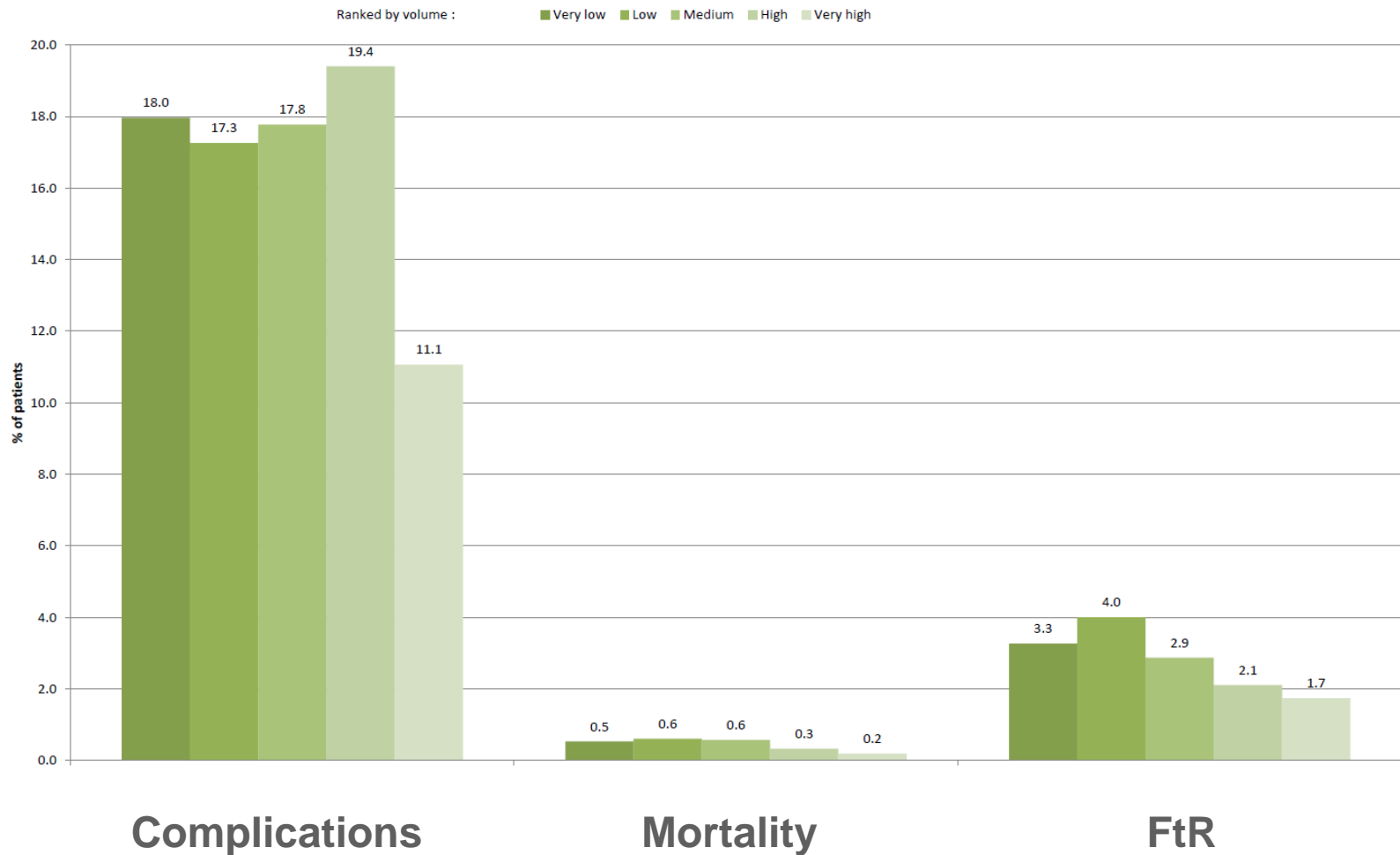
ISOS: Results

- 7,508 patients developed complications (16.8%)
- 207 patients died (0.5%)
- 5,254 patients with one complication (11.7%)
- 2,254 patients with ≥ 2 complications (5.0%)
- Failure to Rescue rate: 2.8%

ISOS: Results

- Infection: 9% of patients; 2.6% mortality
- CVS: 5% of patients; 6.9% mortality
- Other: 13% of patients; 2.8% mortality

- Lowest mortality: Pulmonary embolism (2%)
- Highest mortality: Cardiac arrest (44%)

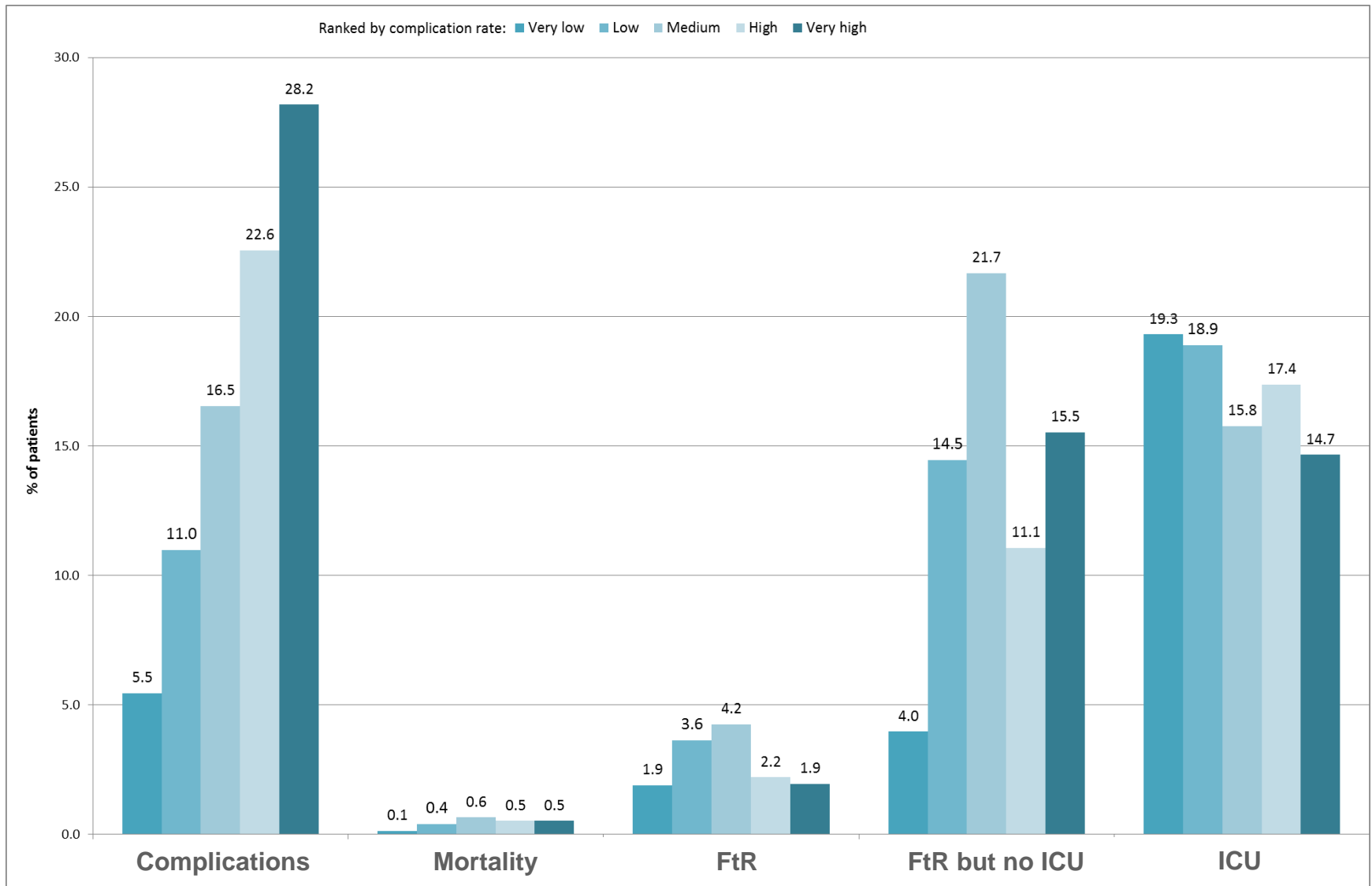


Failure to Rescue

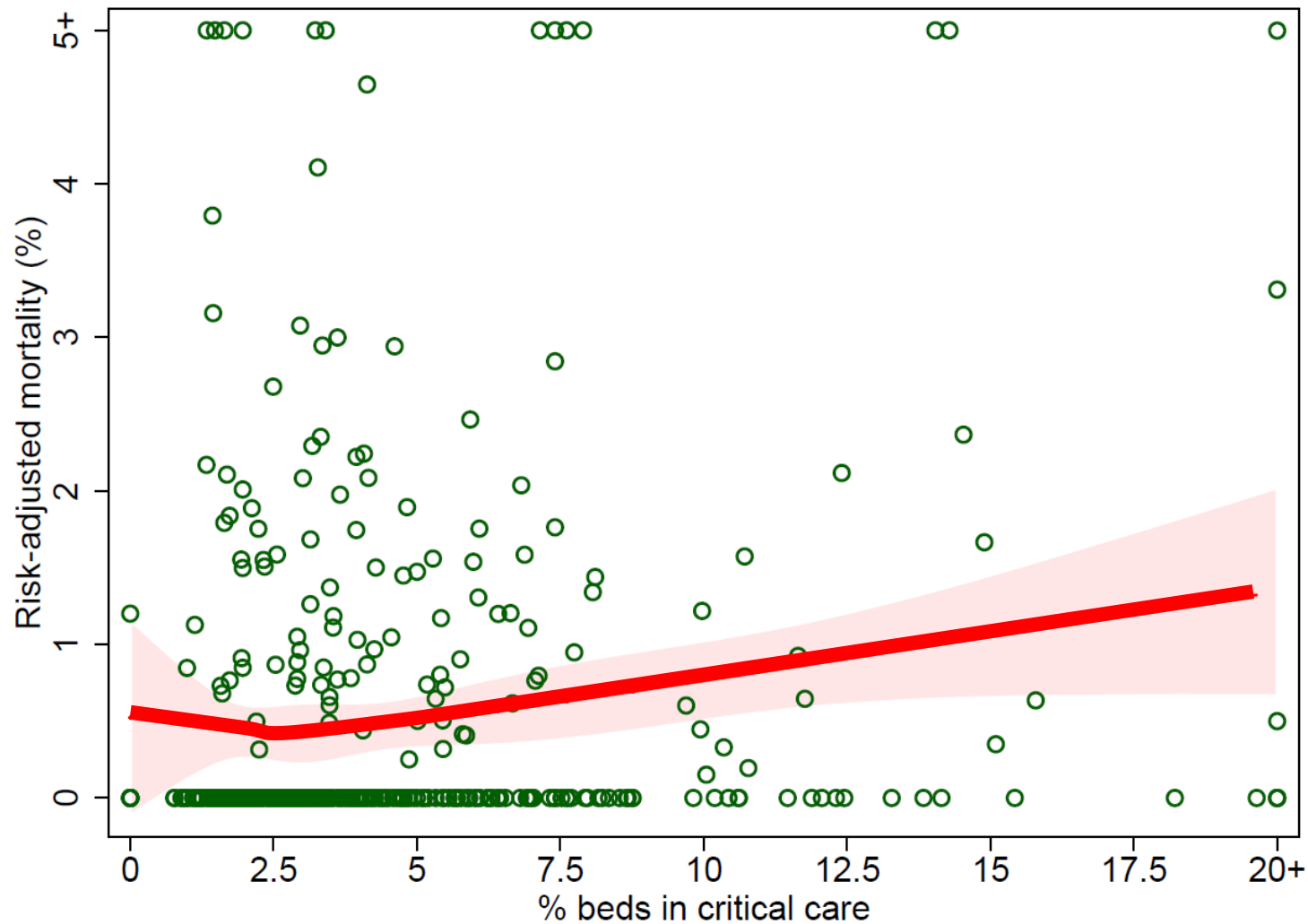
Hospitals ranked in quintiles by activity volume

ISOS: Failure to Rescue

- Failure to Rescue rate: 2.8% (207 of 7508 patients)
- Mortality varies three-fold across quintiles
- Mortality highest in lowest volume quintile
- FtR varies two-fold across quintiles
- FtR helps explain why patients die

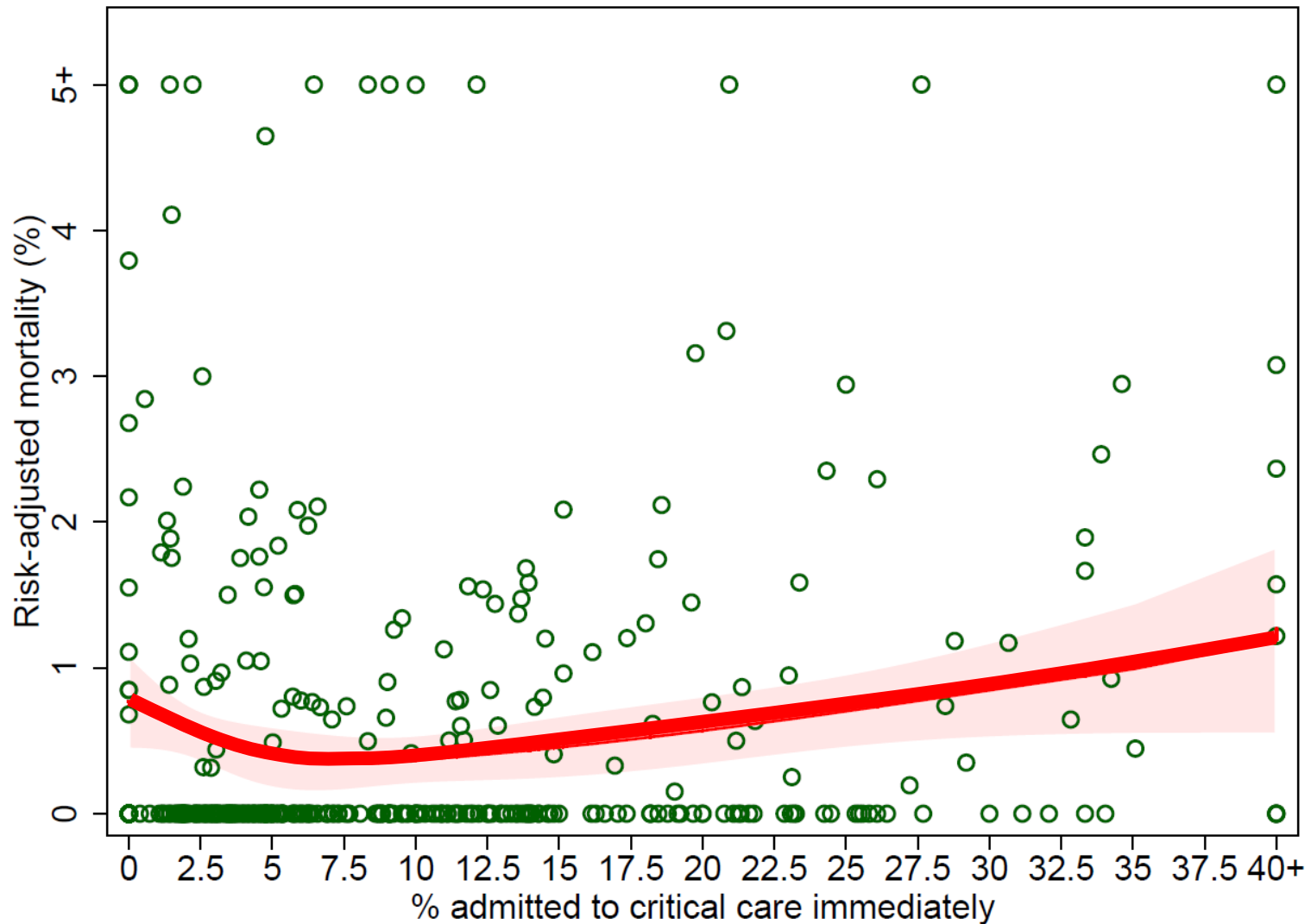


Failure to Rescue: Hospital response to the deteriorating patient



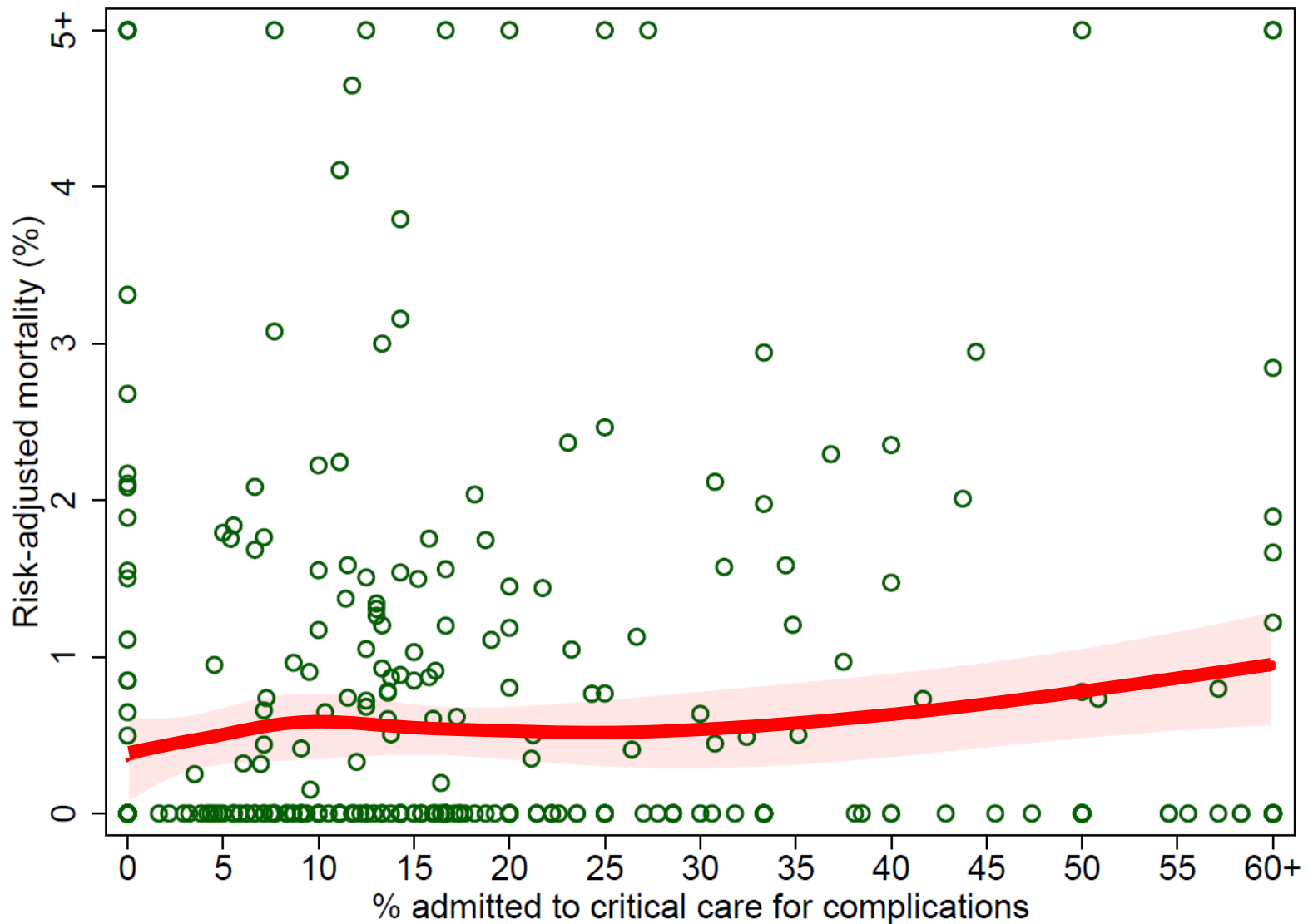
ICU bed provision and mortality

Kahan B et al. 2016; under review



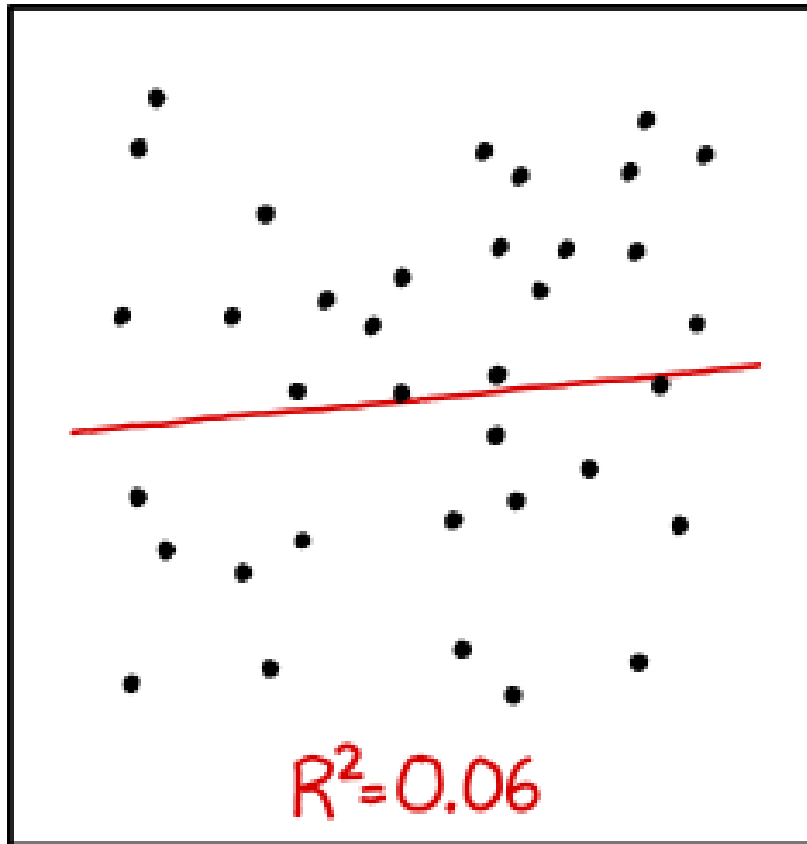
Planned ICU admission and mortality

Kahan B et al. 2016; under review



ICU admission for complications

Kahan B et al. 2016; under review



I DON'T TRUST LINEAR REGRESSIONS WHEN IT'S HARDER TO GUESS THE DIRECTION OF THE CORRELATION FROM THE SCATTER PLOT THAN TO FIND NEW CONSTELLATIONS ON IT.

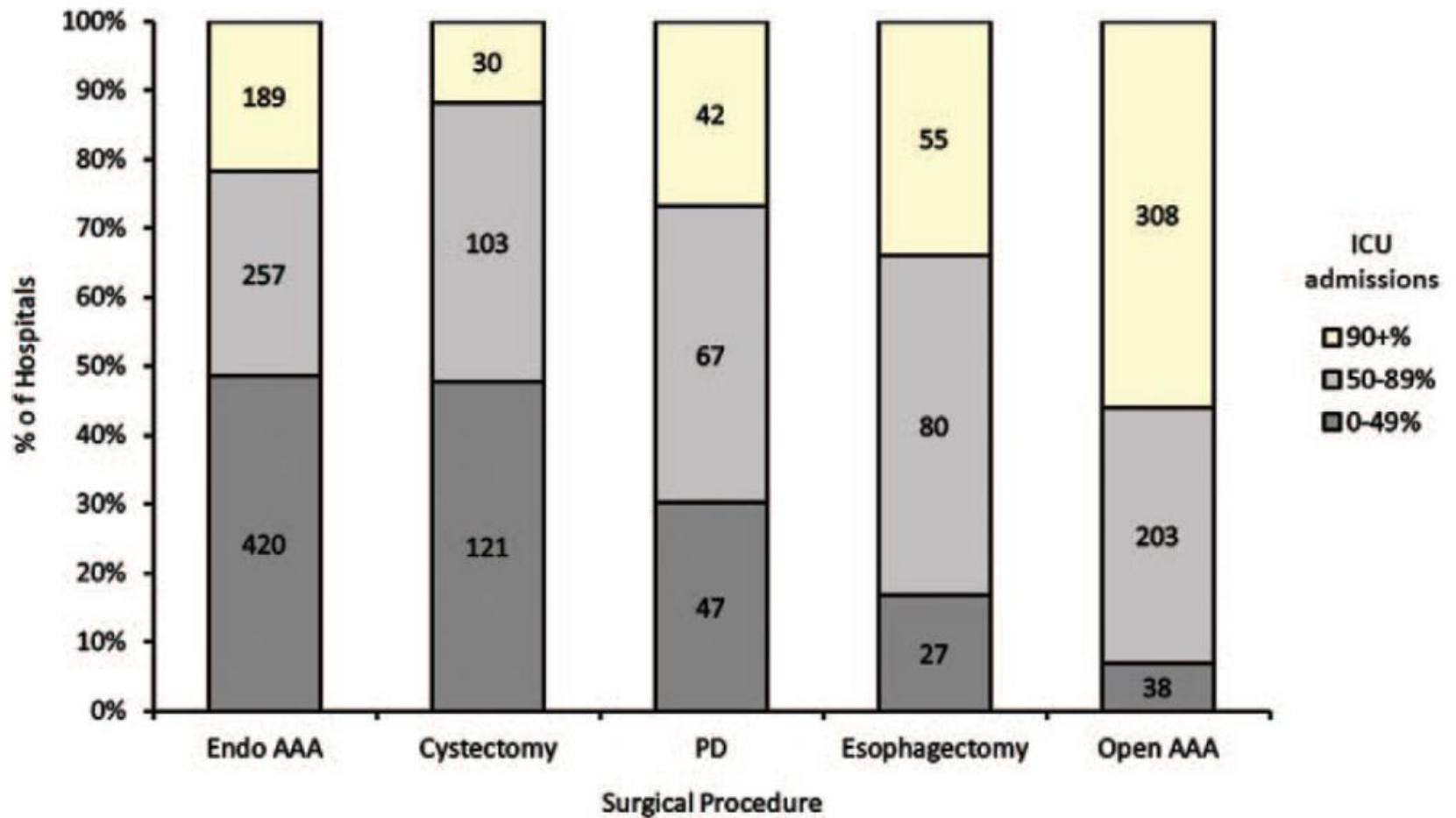
ISOS: Critical Care effect...?

- At patient level:

- More deaths with direct Critical Care admission (2% vs 0.25%)
- Mortality still greater after risk adjustment (OR 3.11 [2.13-4.52])

- At hospital level

- No protective effect of increased admissions to Critical Care
- No protective effect of increased Critical Care beds



ICU not associated with lower mortality after surgery in USA

Wunsch et al. Anesthesiology 2016; 124: 899-907



Editorial Views | April 2016

Intensive Care after High-risk Surgery: What's in a Name?

Michael A. Gillies, M.D., F.R.C.A.; Rupert M. Pearse, M.D., F.R.C.A.

+ Author Notes

Anesthesiology 4 2016, Vol.124, 761-762.
doi:10.1097/ALN.0000000000001025

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19

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TOOLS

MORE than 310 million patients undergo surgical treatments each year.¹ Although many such procedures are uneventful, we know that a proportion of patients will develop serious complications that impact on their survival and quality of life, both in the days that follow surgery and in the long term.^{1,2} There are many components to a safe and effective perioperative care pathway, but postoperative admission to an intensive care unit (ICU) is commonly regarded as an important standard for many complex major procedures.³ Indeed, differences in availability and use of an ICU are

RELATED ARTICLES

Use of Intensive Care Services for Medicare Beneficiaries Undergoing Major Surgical Procedures

Key Clinical Topics in Anaesthesia

Anesthesia Literature Review

Anesthesia Literature Review

Anesthesia Literature Review

RELATED TOPICS

Critical Care



Surgical outcomes and the future...?

- High volume of surgery
- Outcomes poor for many patients
- Failure to rescue remains a problem
- Intensive care not an isolated solution
- New approach to critical care needed



Last chance for questions....