

# What is the role of ICNARC...?

Kathy Rowan

## Brief history...

- UK APACHE II Study (1987-1993)
- Proposal to Dept. of Health (1991-1993)
- Two-year pump-priming grant with remit to be self-financing (1994-1995)
- ICNARC (1994-)

## ICNARC...

- Independent Registered Charity (July 1994)
- Founded on a registry - Case Mix Programme
- Annual turnover £0.75-£1.25m per annum
- Staff of 15-30 (dependent on winning research income) - no clinical staff

## Board of Management / Trustees

- Nick Black - Research Advisor
- Stephen Brett - ICS Member
- Maureen Dalziel - NHS Advisor/Patient rep.
- Lisa Hinton - Patient rep.
- David Menon - ICS President rep.
- Peter Nightingale - Clinical Advisor
- Terry Rickwood - Business Advisor
- Alasdair Short (Chair) - Clinical Advisor
- Duncan Young - Ex-ICS Director of Research

## Mission...

- To foster improvements in the organisation and practice of critical care in the UK to improve patient care and outcomes

## Goals...

- Promoting local audit of critical care through the provision of comparative data
- Developing a broad programme of research of relevance to those commissioning, managing, practising and receiving critical care
- Improving the quality of audit and research in critical care
- Promoting the use of evidence in critical care practice and policy
- Building research capacity in critical care

## Goals...

- Promoting local audit of critical care through the provision of comparative data

# Case Mix Programme...

- What is it?  
*...a national, comparative audit of patient outcome from intensive care*
- What is its aim?  
*...a performance assessment programme for continued improvement through the provision of comparative data on case mix, outcomes, activity and key potential quality indicators to facilitate local performance management*

## Case Mix Programme..

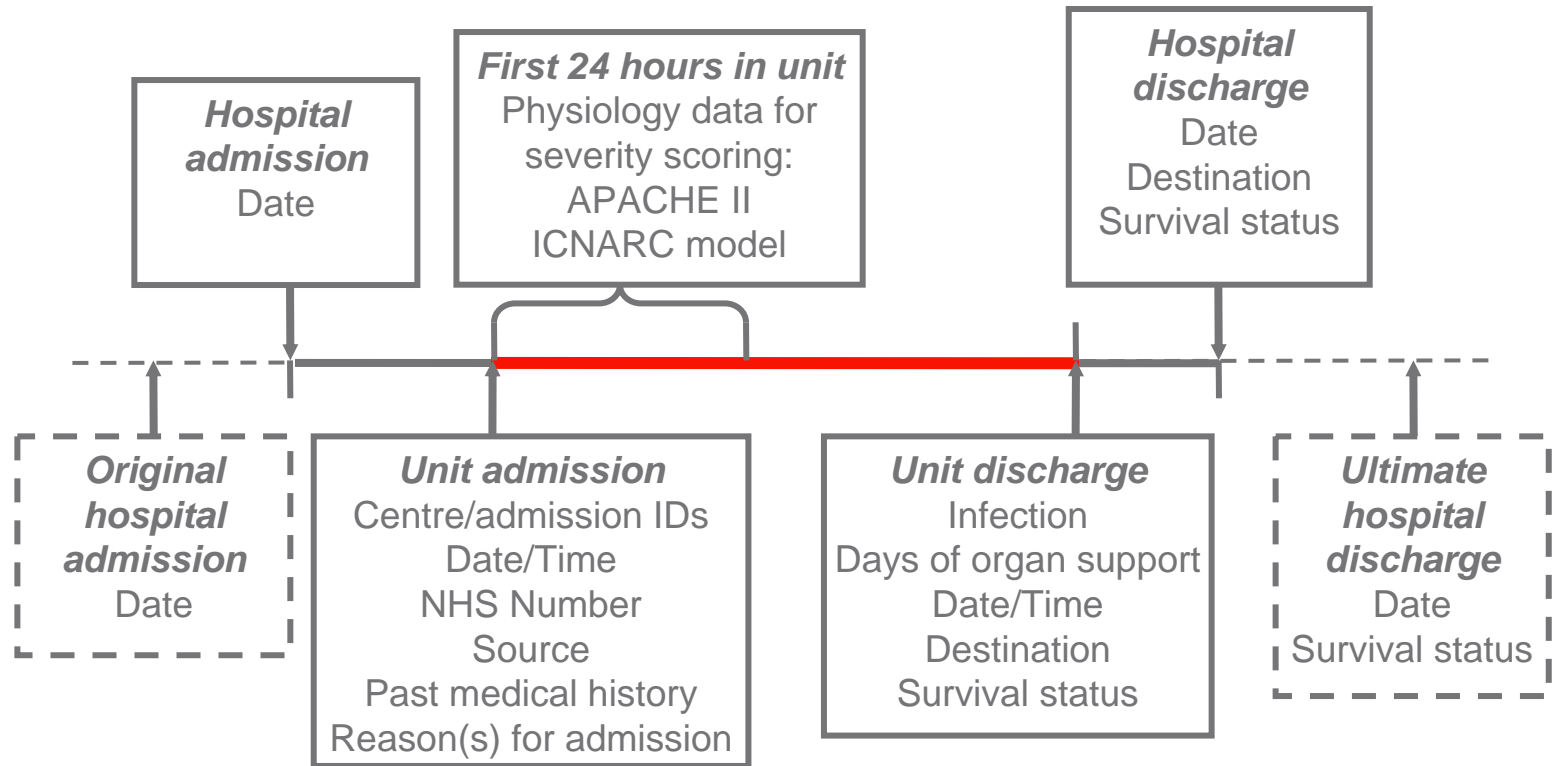
- Remit for England, Wales, Northern Ireland
- NHS and non-NHS units
- Voluntary participation
- 209 critical care units  
(over 82% of all possible adult, general critical care units)



## Case mix

- Age
- Acute severity
- Comorbidity
- Source of admission
- Surgical status
- Reason for admission

# Case Mix Programme dataset...



## Data collection...

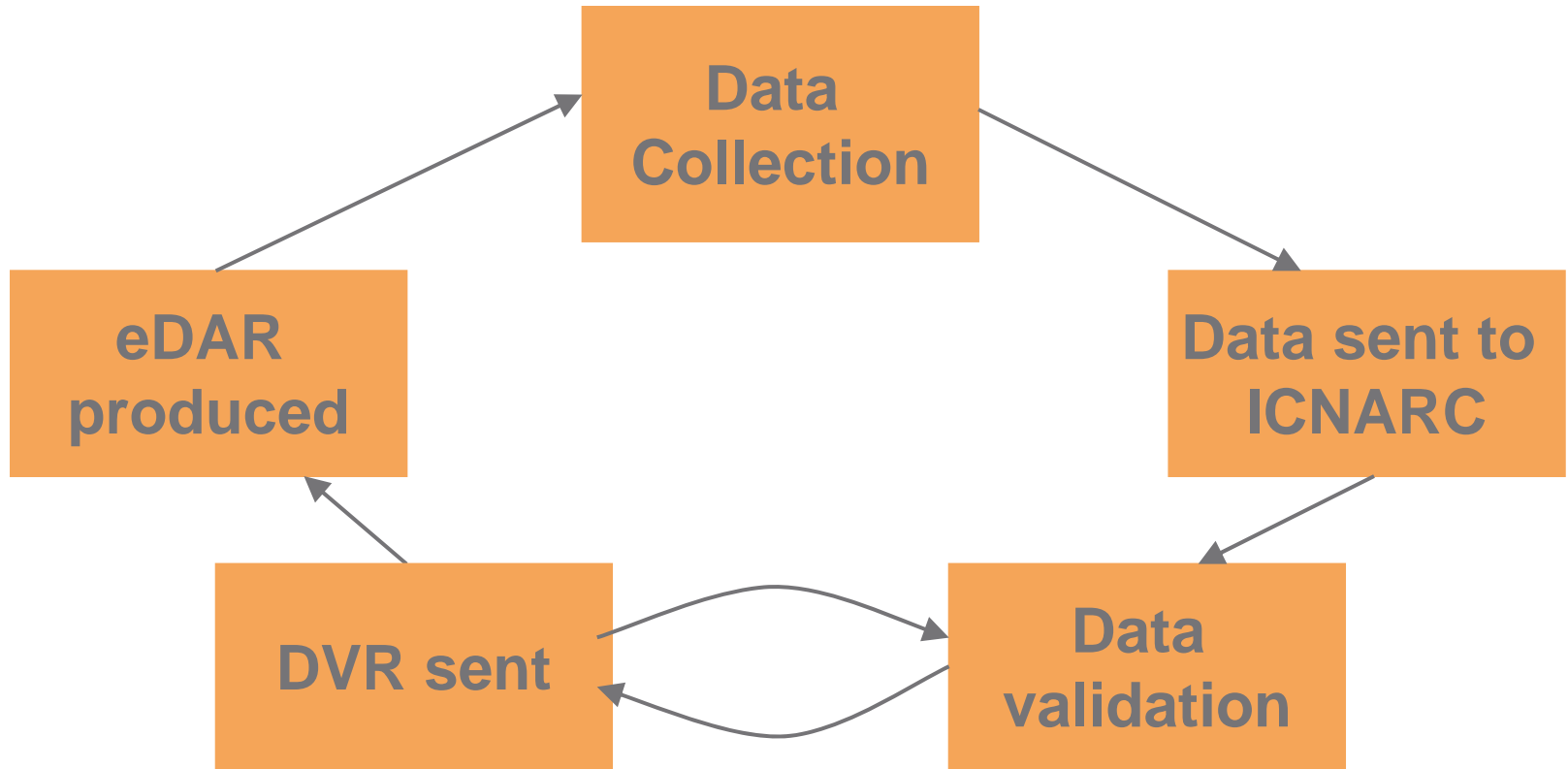
- Dataset specification/xml schema
- Software developers
- Data collection training
- Data collection manual - rules/definitions
- Data collection/capture on consecutive admissions
- Local data entry/validation
- Submitted quarterly



# Confidentiality/data security

- Legal agreement
  - source of data confidentiality between unit and ICNARC
- Information Commissioner, NIGB (PIAG) annual review
  - to hold patient identifiable data
- Conform to NHS data security requirements
  - password protected data encryption

# The Case Mix Programme process



# Directory of Clinical Databases (www.docdat.org)

## Case Mix Programme Database (CMPD)

	CMPD Level			
	1	2	3	4
<b>A.</b> Representative of country	■	■	■	
<b>B.</b> Completeness of recruitment	■	■	■	■
<b>C.</b> Variables included	■	■	■	
<b>D.</b> Completeness of variables	■	■	■	
<b>E.</b> Collection of raw data	■	■	■	■
<b>F.</b> Explicit definitions	■	■	■	■
<b>G.</b> Explicit Rules	■	■	■	■
<b>H.</b> Reliability of coding	■	■	■	■
<b>I.</b> Independence of observations	■	■	■	■
<b>J.</b> Data validation	■	■	■	

## Reporting...

- Quarterly
  - Quality Indicators and Outcomes
  - Presentation Summary
  - Case Mix Summary
  - Data Appendix
  - Guide to Version 3.1 eDAR
- Free ad hoc analyses
- Free annual conference
- Cost to units: £2,313 to £4,626

## eDAR documents

- Quality Indicators and Outcomes
- Presentation Summary
- Case Mix Summary
- Data Appendix
- Guide to your Version 3.0 eDAR

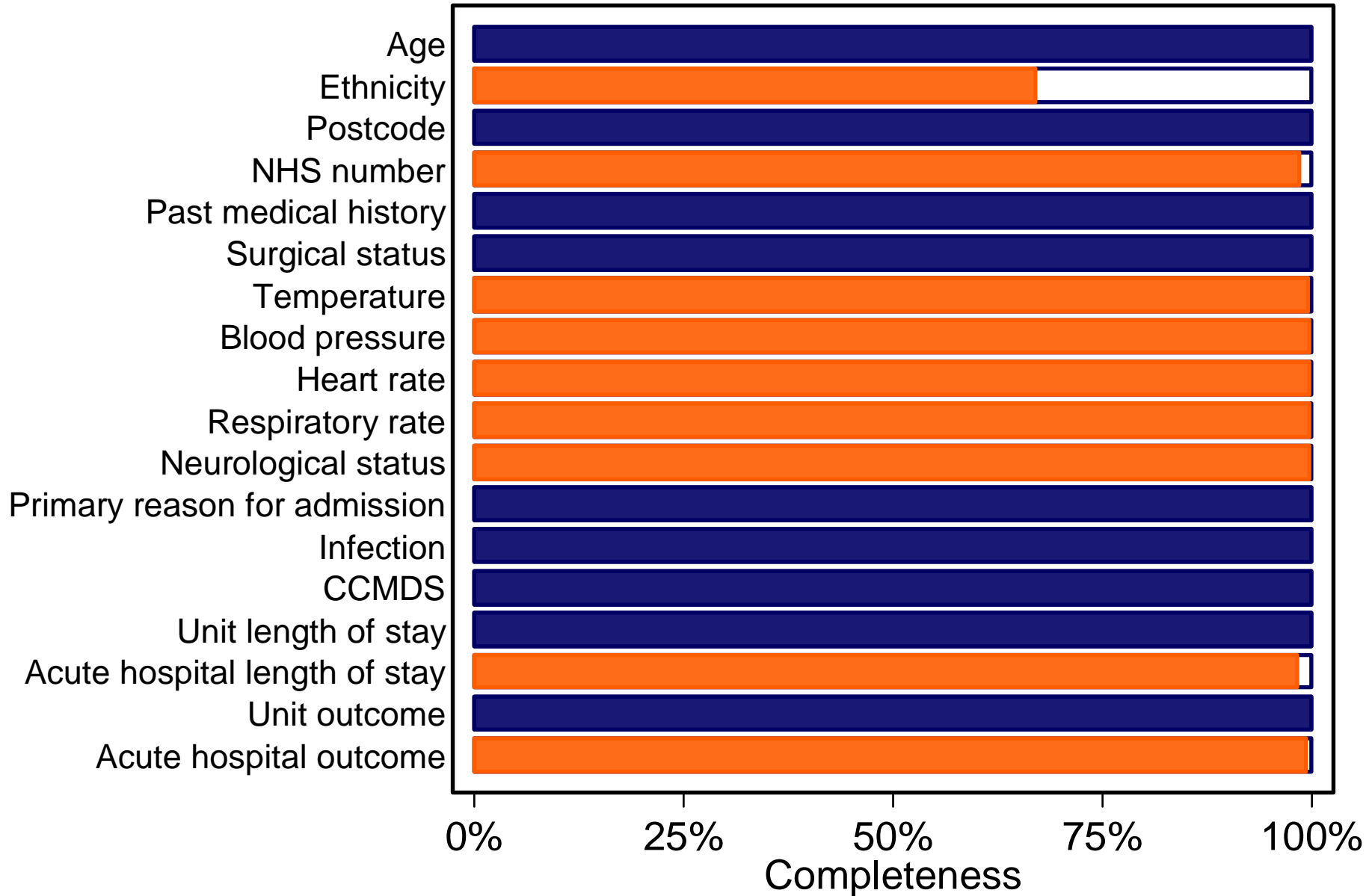
## Quality Indicators and Outcomes

- Summarises data for period and trends
- Sections on:
  - participation
  - data completeness
  - potential quality indicators
  - local monitoring for specific groups
  - mortality
  - activity

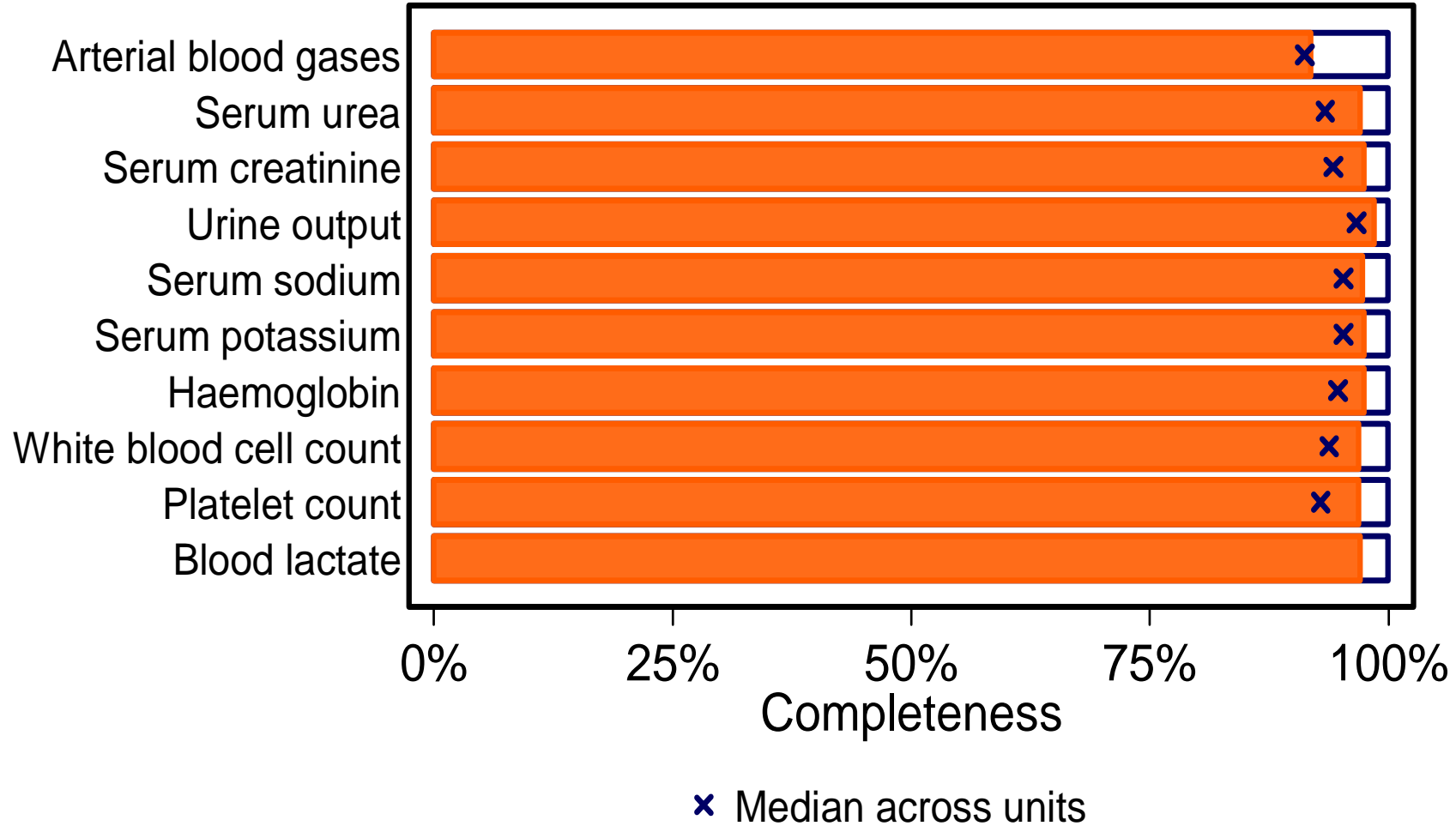
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# Completeness (example)



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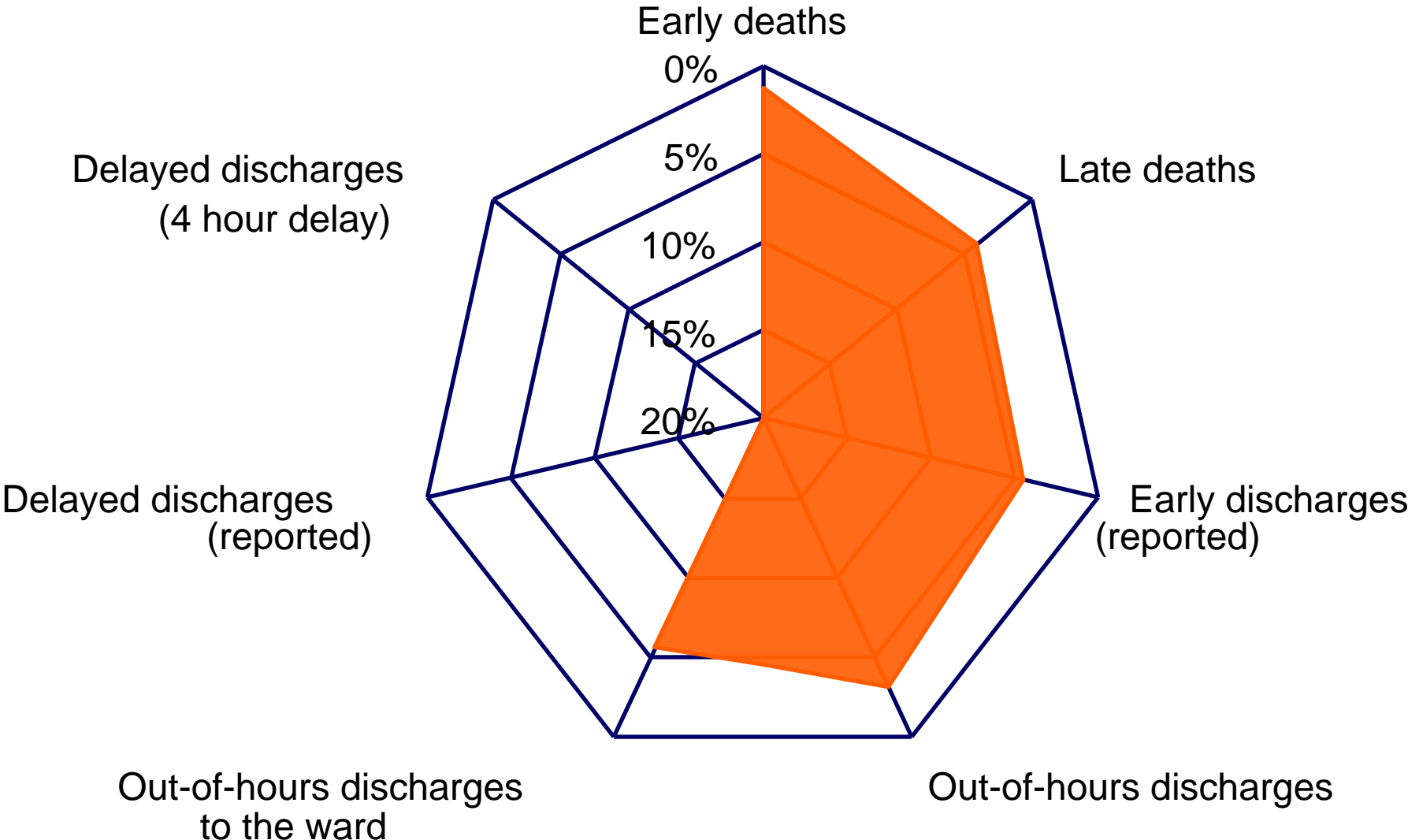
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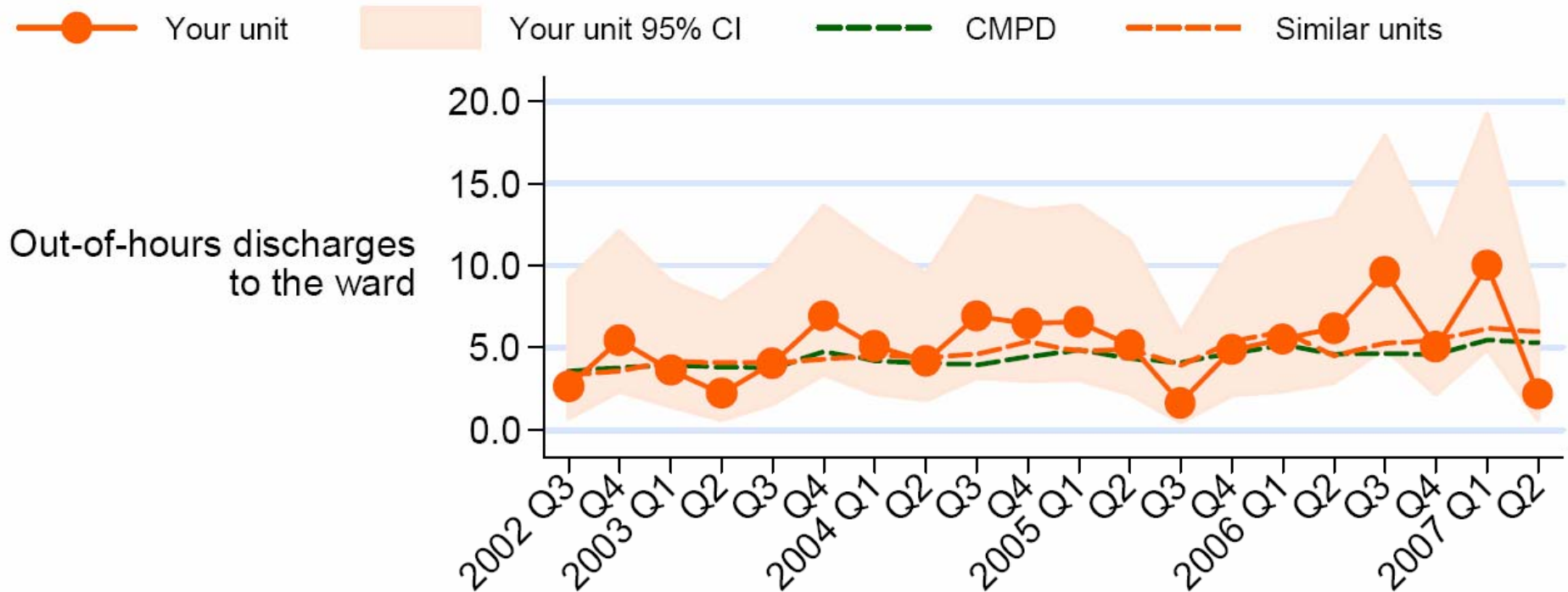
# Potential quality indicators - delivery of care

- Early deaths  
*within four hours of admission - % all admissions*
- Late deaths  
*after seven or more days after admission - % all admissions*
- Early discharges  
*reported and excluding self-discharges - % unit survivors*
- Out-of-hours discharges  
*between 00:00 and 06:59 - % unit survivors*
- Out-of-hours discharges to the ward  
*between 00:00 and 06:59 to the ward - % unit survivors*

# Delivery of care - spider (CMPD)



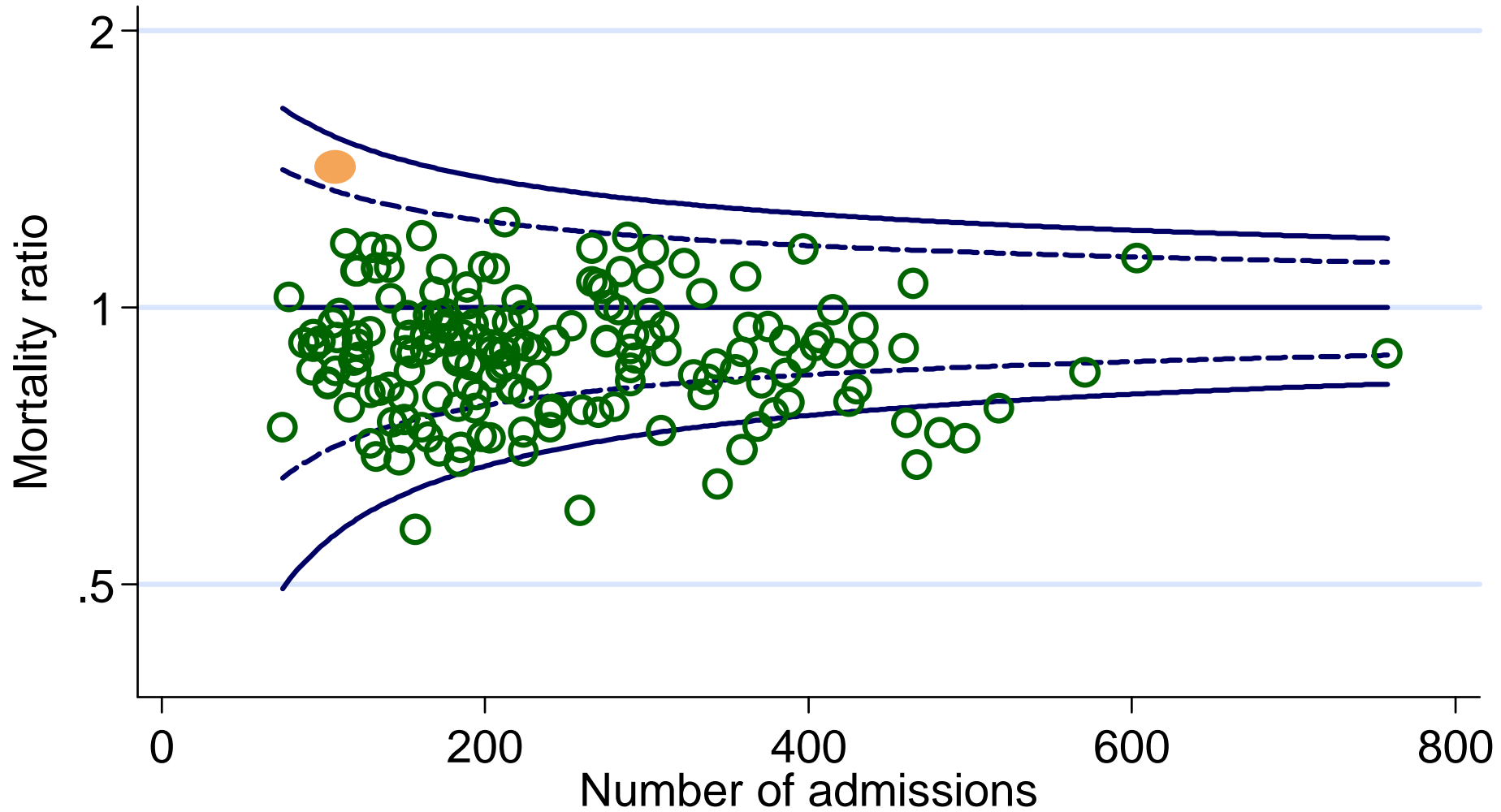
# Delivery of care - trend (example)



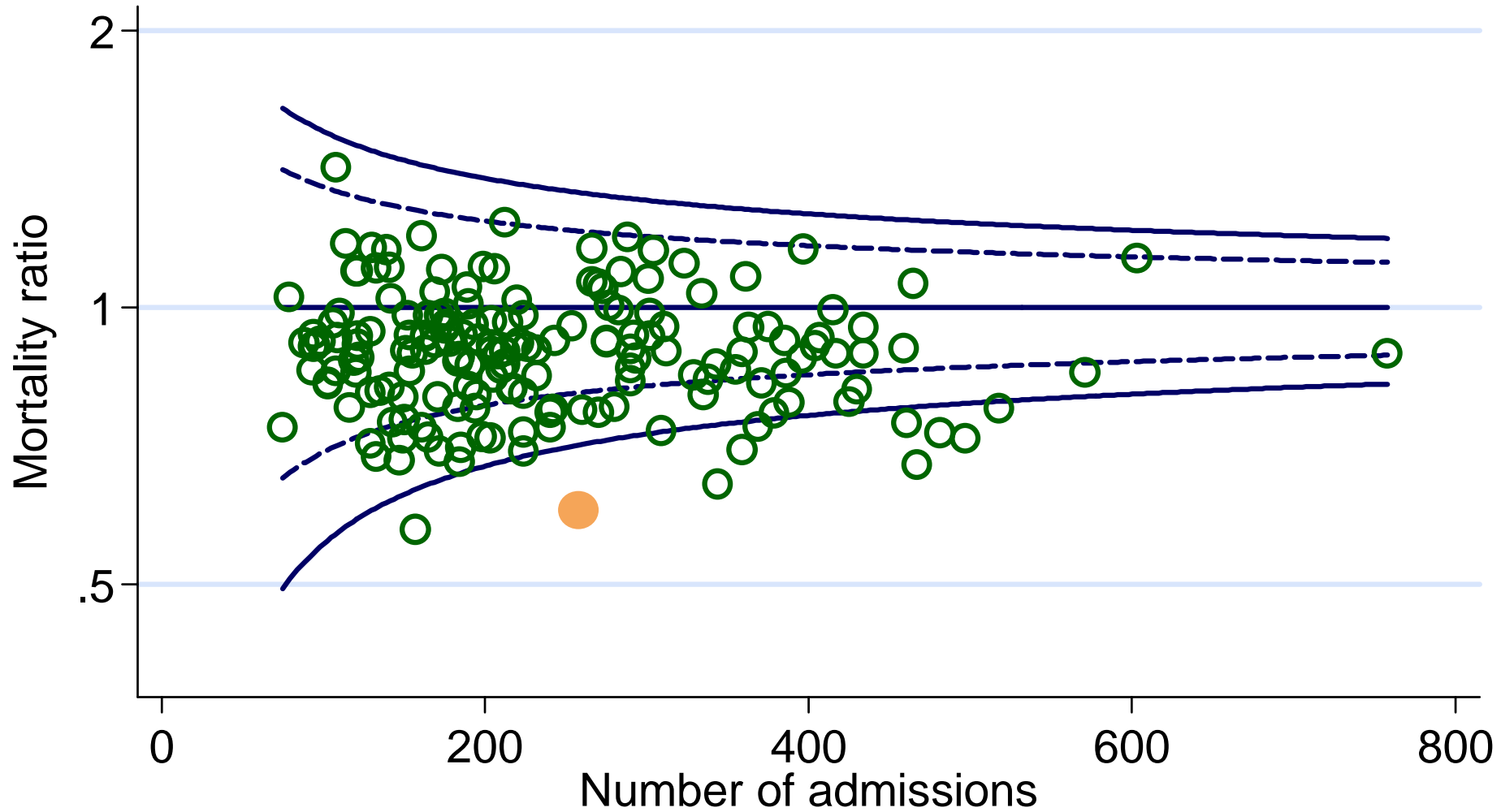
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# Risk adjusted hospital mortality...



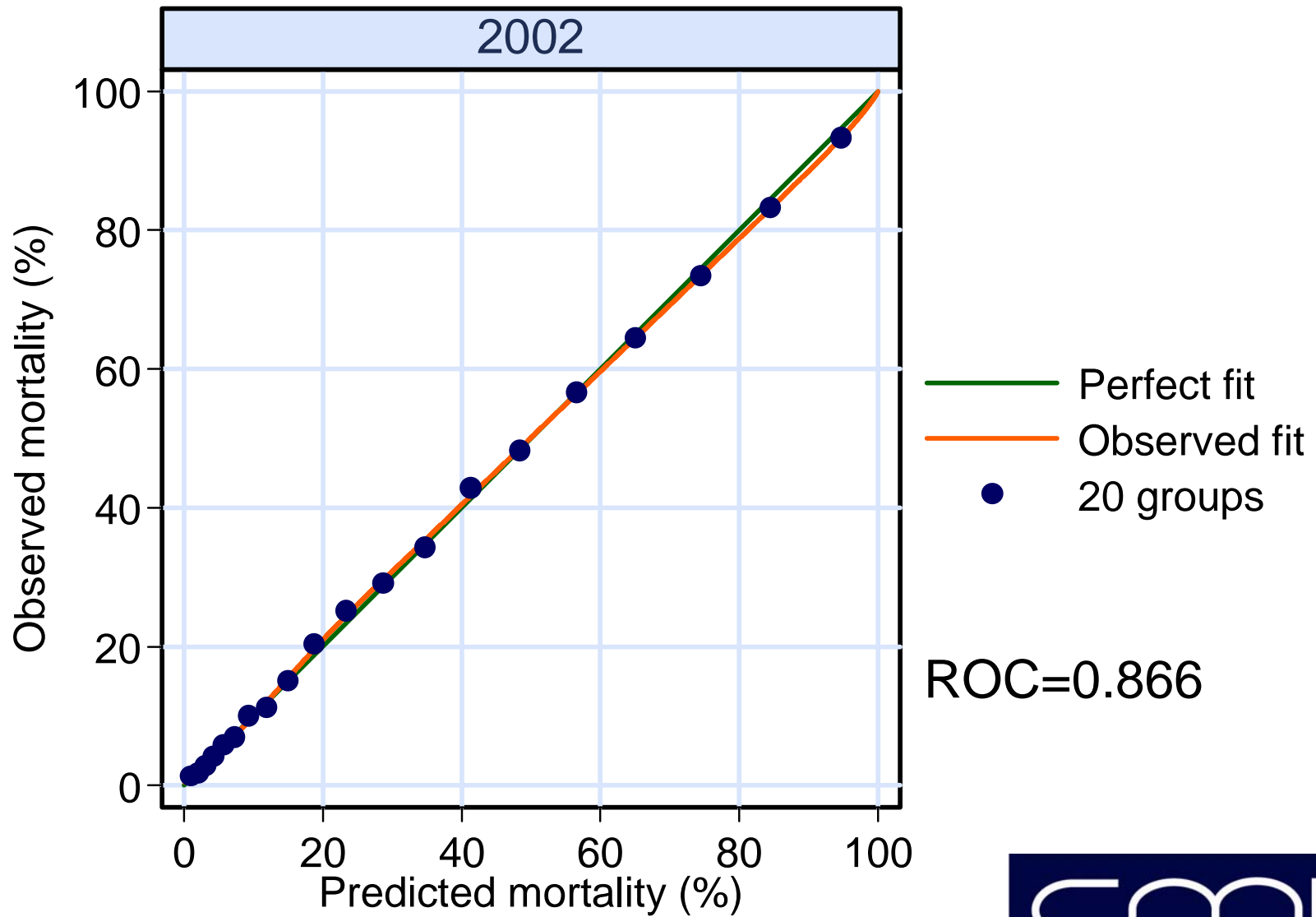
# Risk adjusted hospital mortality...



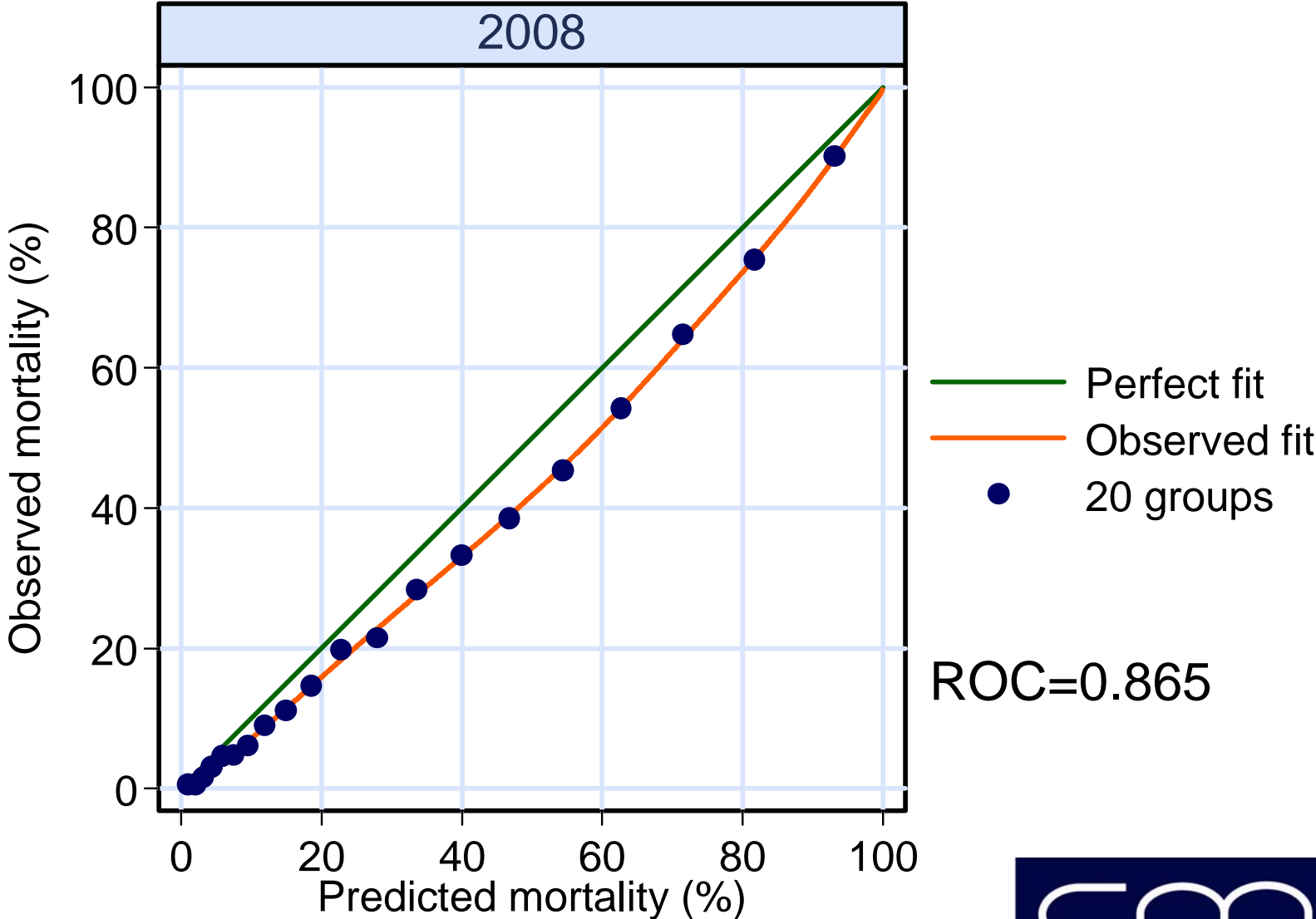
## Case Mix Programme...

- Improved risk adjustment - ICNARC model
- Regular recalibration of model

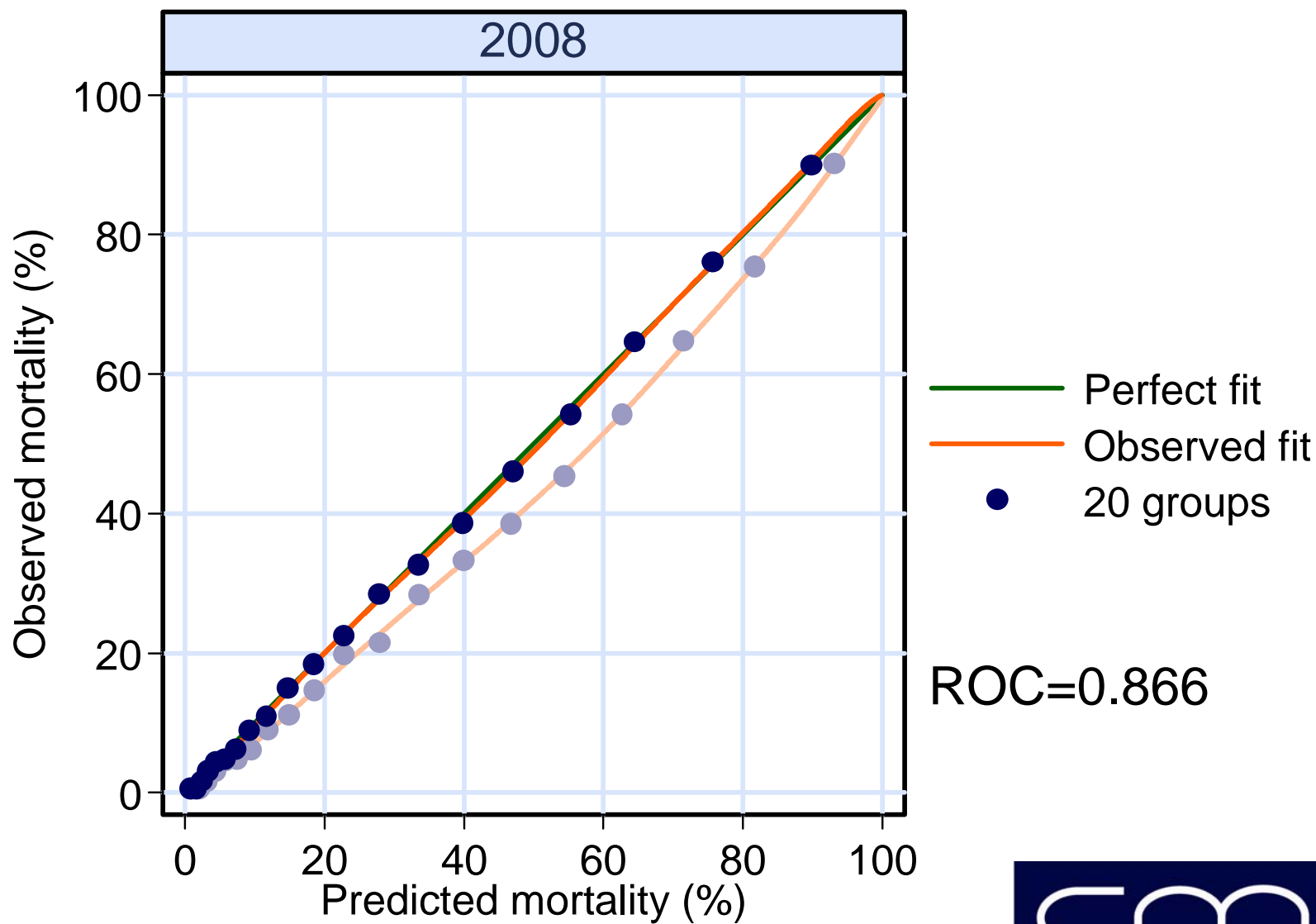
# ICNARC model - original



# ICNARC model - original



# ICNARC model - recalibration



## Case Mix Programme...

- Improved risk adjustment - ICNARC model
- Regular recalibration of model
- 2006 - new dataset - Version 3.0
- 2006 - addition of quality indicators to reports
- Reporting both to units and networks
- Case Mix Programme Database
  - high quality clinical database (818,309 admissions to 229 units - 17/6/09)
- Free analysis service to participants
- Income generator for non-participants

## National Cardiac Arrest Audit...

- Feasibility study for RC(UK) in 2007/08
- Established and NCAA Co-ordinator appointed (2008)
- Scope - individuals receiving chest compressions and/or defibrillation from the hospital based resuscitation team
- Secure, web-based data entry system developed
- Approval/preparations (ongoing...)
- Going "live" late 2009...

## Current audit team...

- Lucy Lloyd-Scott - CMP/NCAA Manager
- Gemma Schönenberger - CMP/NCAA Admin'
- Yemi Banjo/Andrew Fleming/  
David Frazer/Jason Ireland/Rod Sinclair  
- CMP Case Officers
- Edel Gallagher - NCAA Co-ordinator
- Cathy Welch - Statistician
- Petra Selmer/Natalya Volodina/  
Ana Weller - IT/Graphic Design

## Goals...

- Promoting local audit of critical care through the provision of comparative data
- Developing a broad programme of research of relevance to those commissioning, managing, practising and receiving critical care

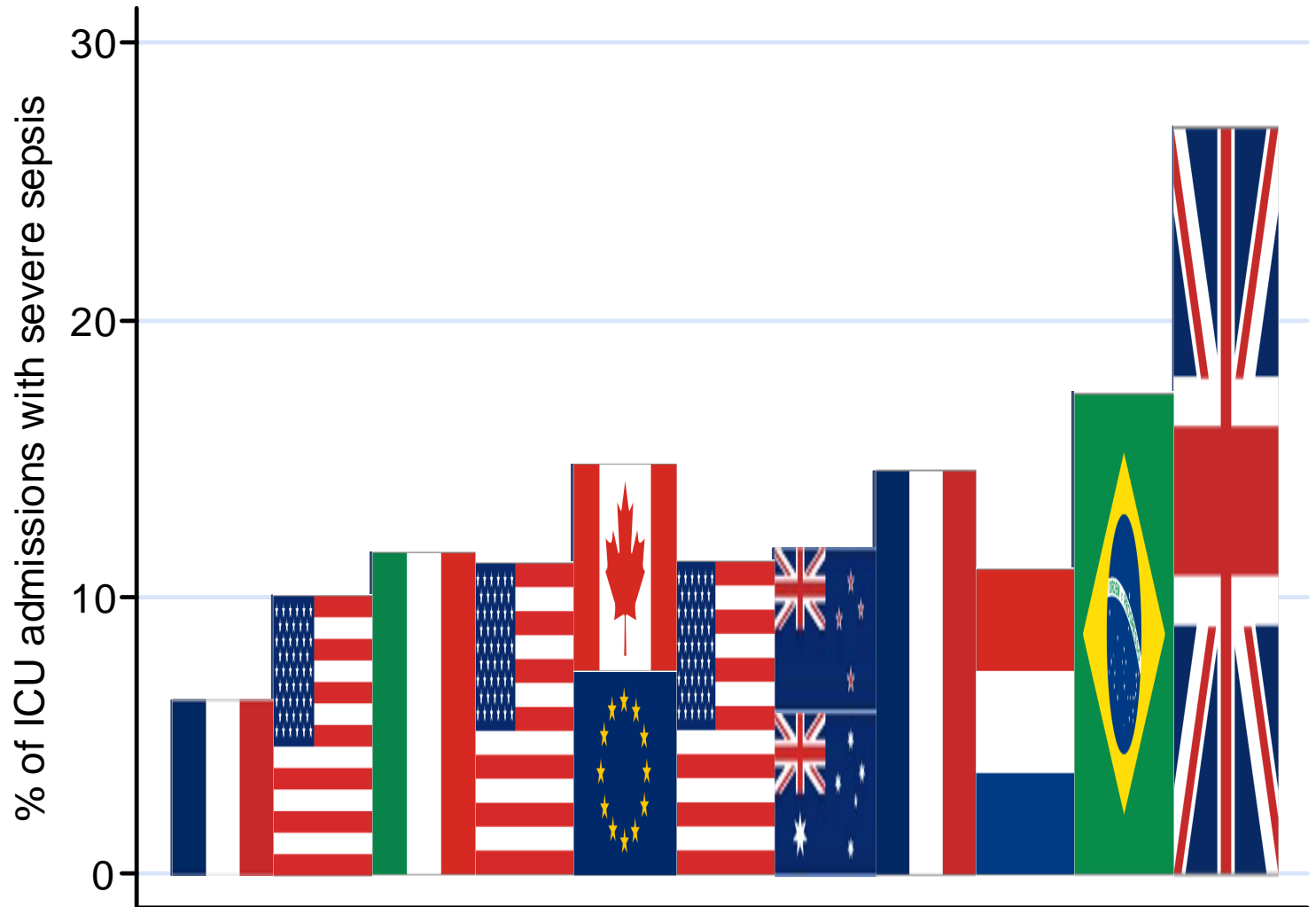
## Completed research (i)...

- COPD/Asthma Outcome Study (CAOS) - **MRC**
- Evaluation of pulmonary artery catheters in patient management (PAC-Man) - **NIHR HTA**
- UK Paediatric Intensive Care Outcome Study (UK PICOS) - **MRC**
- Risk prediction in adult critical care - **MRC**
- Evaluation of critical care outreach services - **NIHR SDO**
- Staff teamwork and safety attitudes - **ICNARC**
- Activated Protein C in severe sepsis - **ICNARC**

## Completed research (ii)...

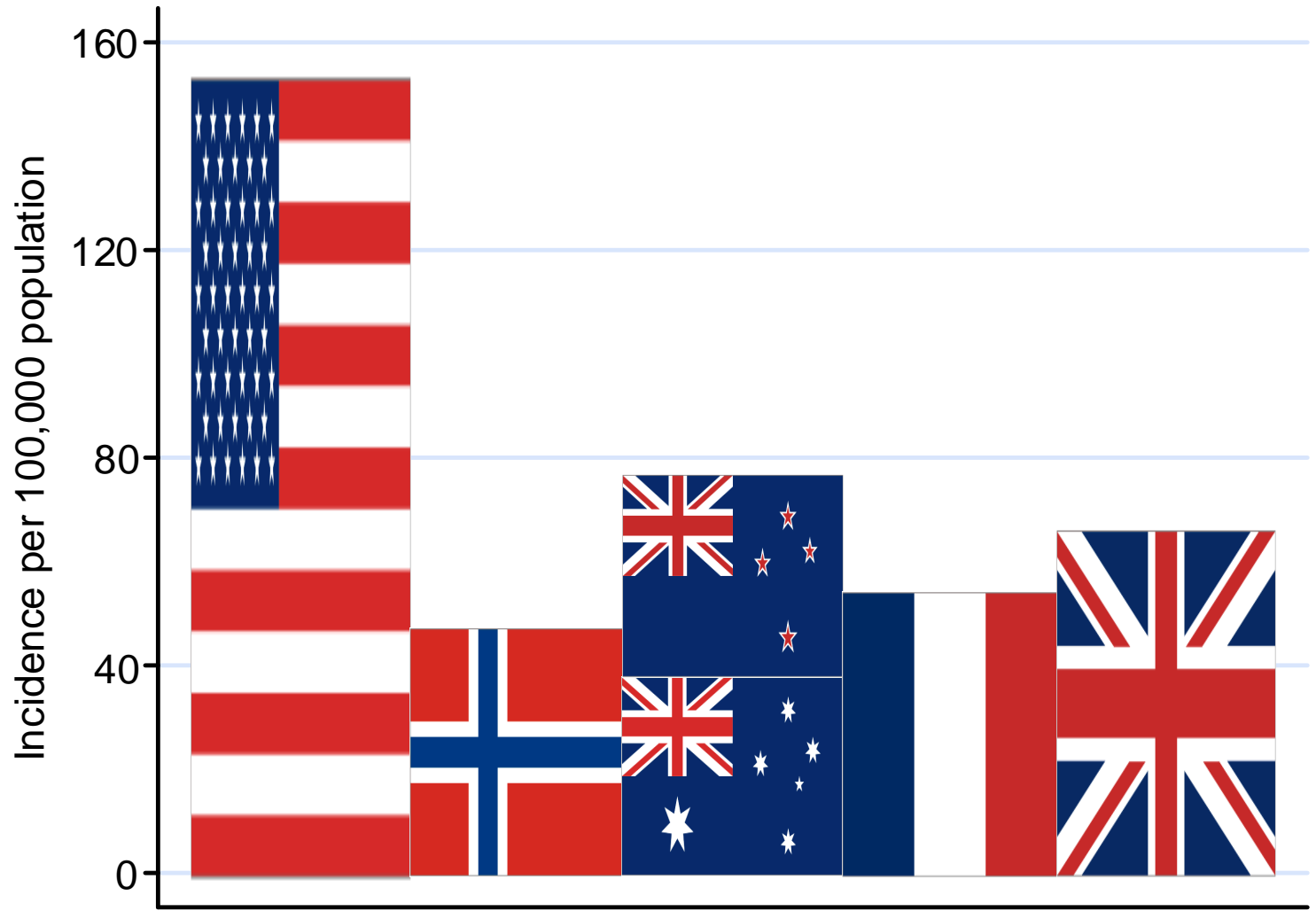
- Case mix/outcomes for: obstetric conditions, severe asthma, pneumonia, head injury, severe sepsis, high risk surgery, chronic renal conditions, acute pancreatitis, alcoholic liver disease, dermatological conditions, cardiac arrest, etc.

## Admissions with severe sepsis



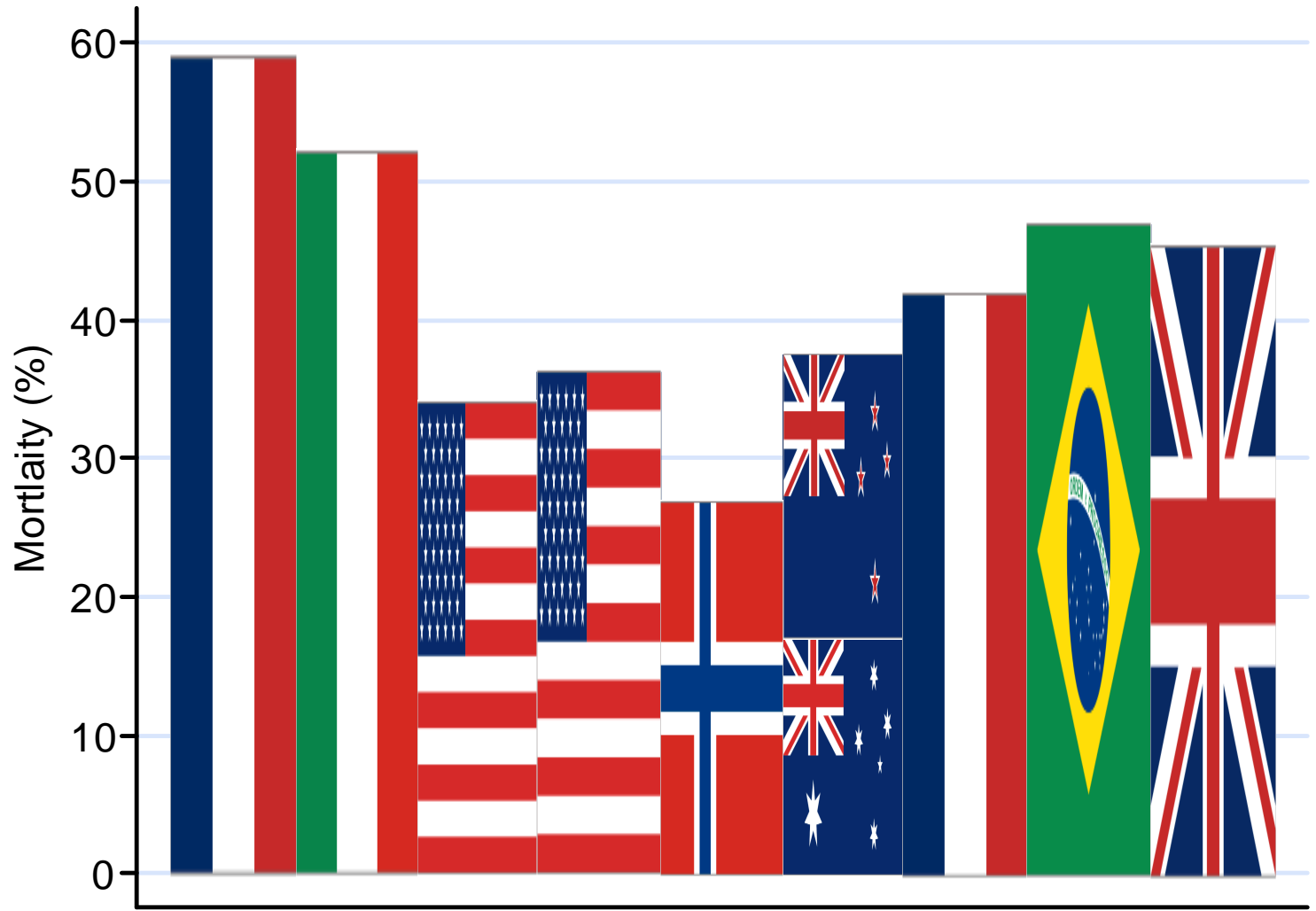
Linde-Zwirble & Angus. *Crit Care* 2004; 8:222–6.

## Incidence per 100,000 population



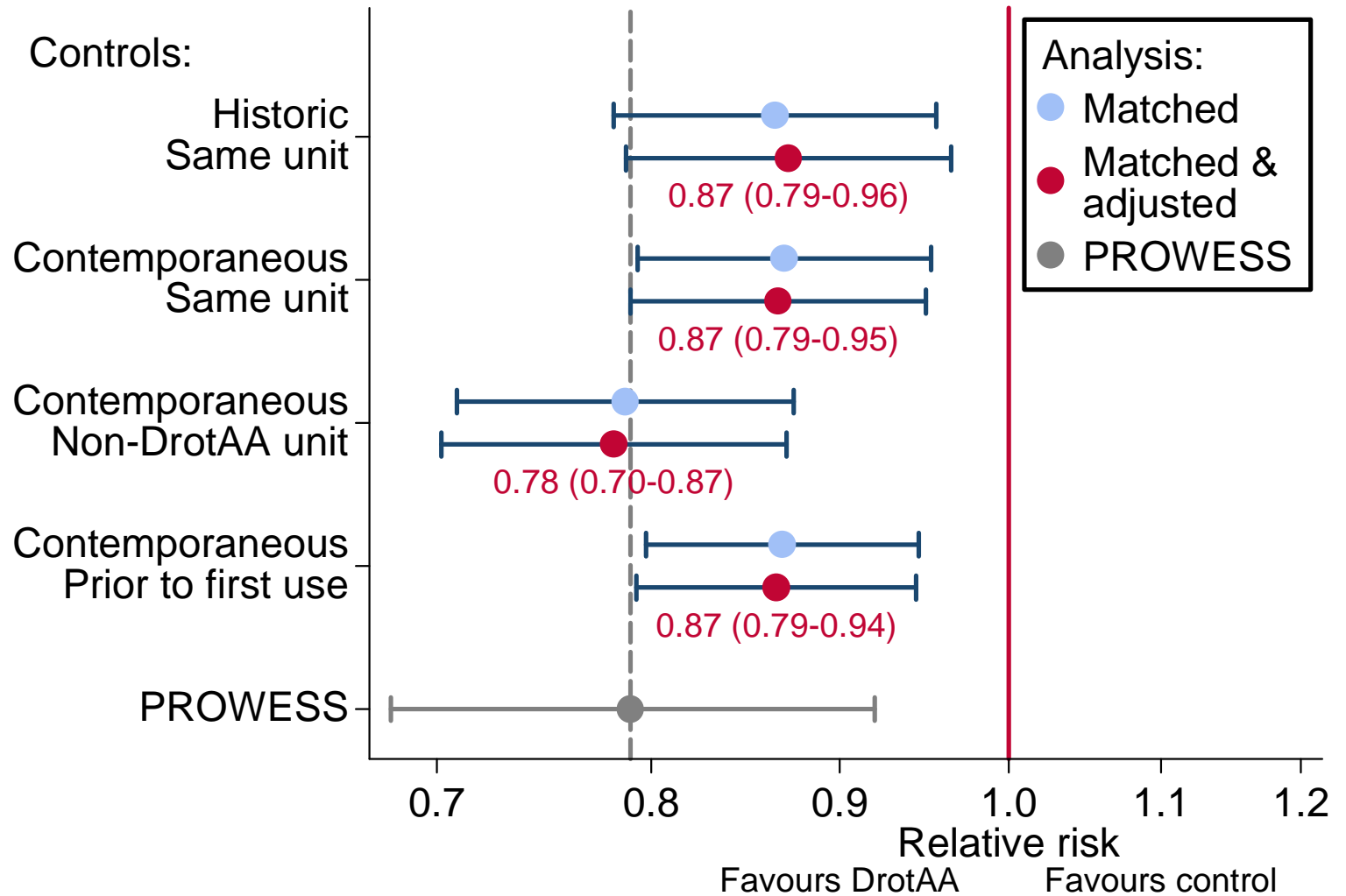
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# Mortality for severe sepsis

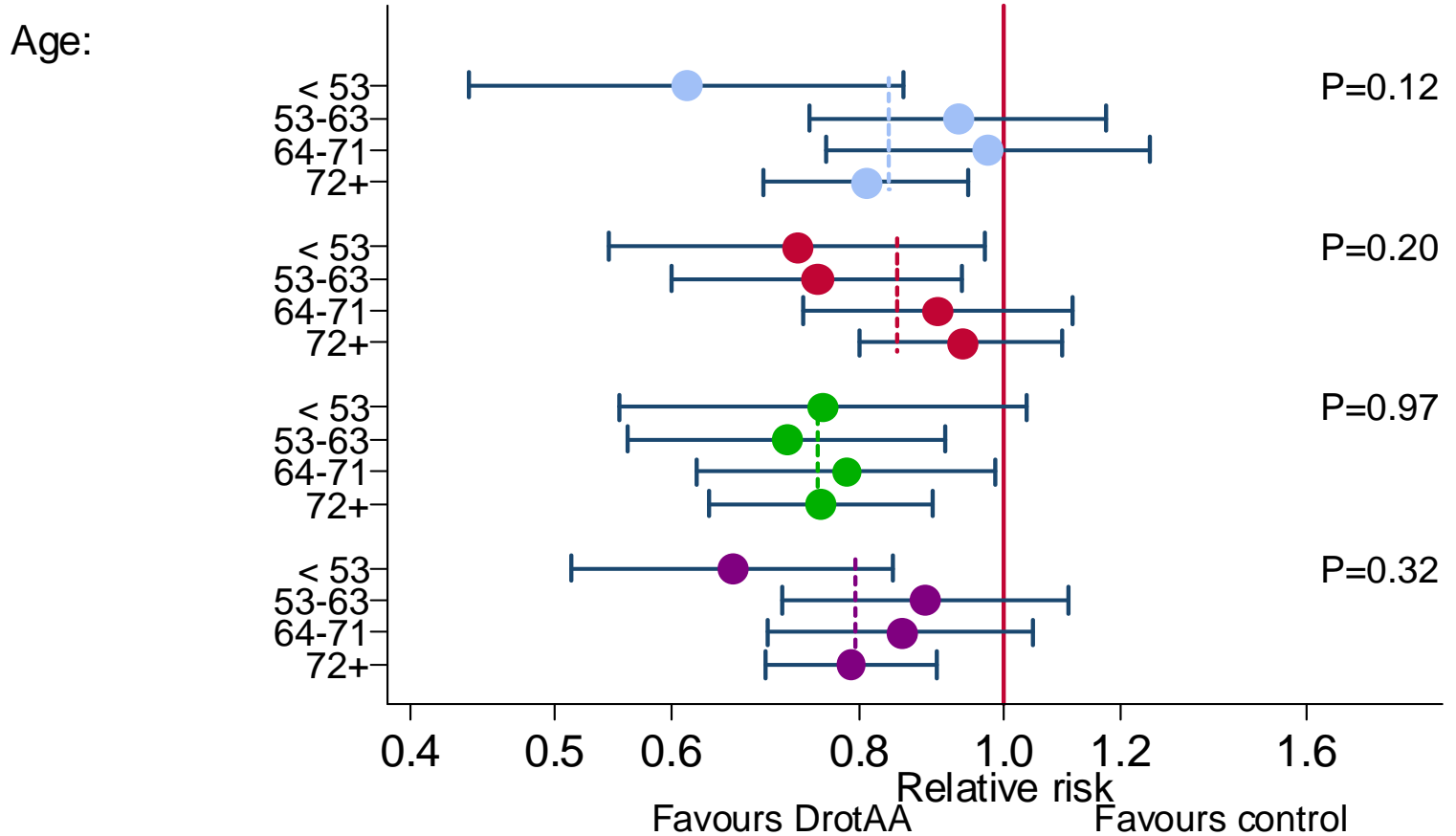


Linde-Zwirble & Angus. *Crit Care* 2004; **8**:222–6.

# Results - overall...



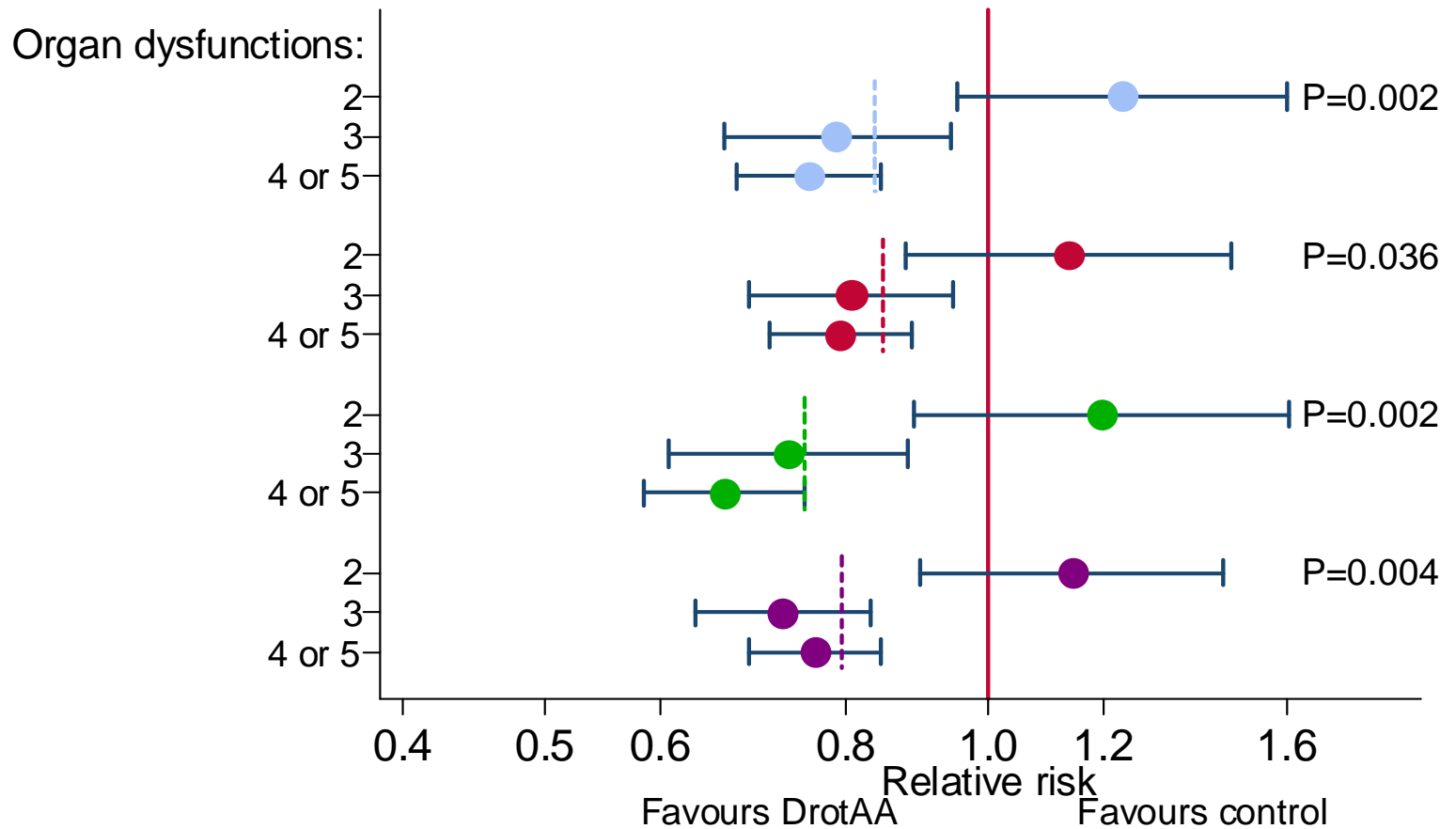
# Subgroups - age...



Controls:

- Historic, same unit
  - Contemporaneous, same unit
- Contemporaneous, non-DrotAA unit
  - Contemporaneous, prior to first use

# Subgroups - number of organ dysfunctions...



Controls:

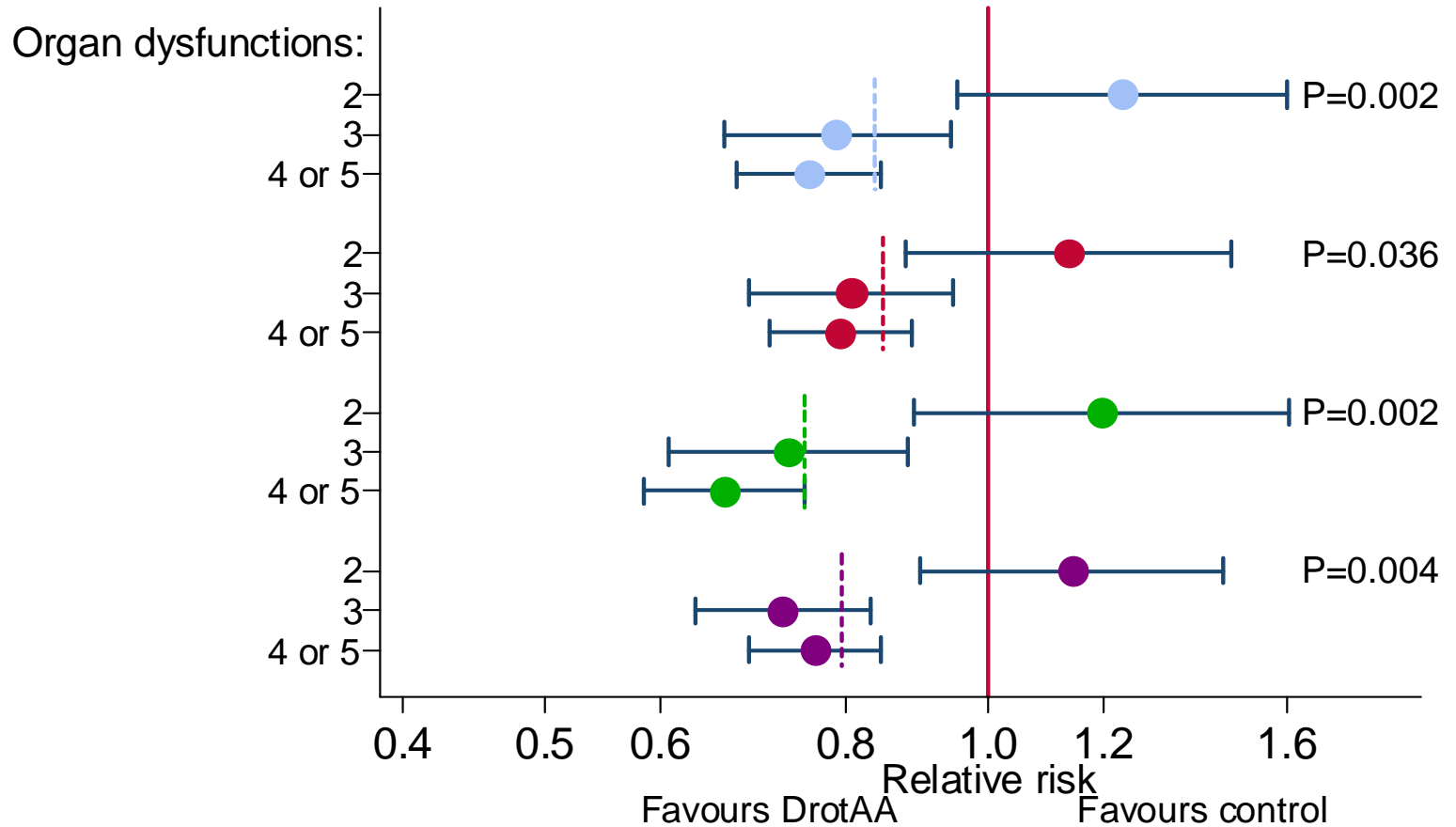
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# Subgroups - number of organ dysfunctions...



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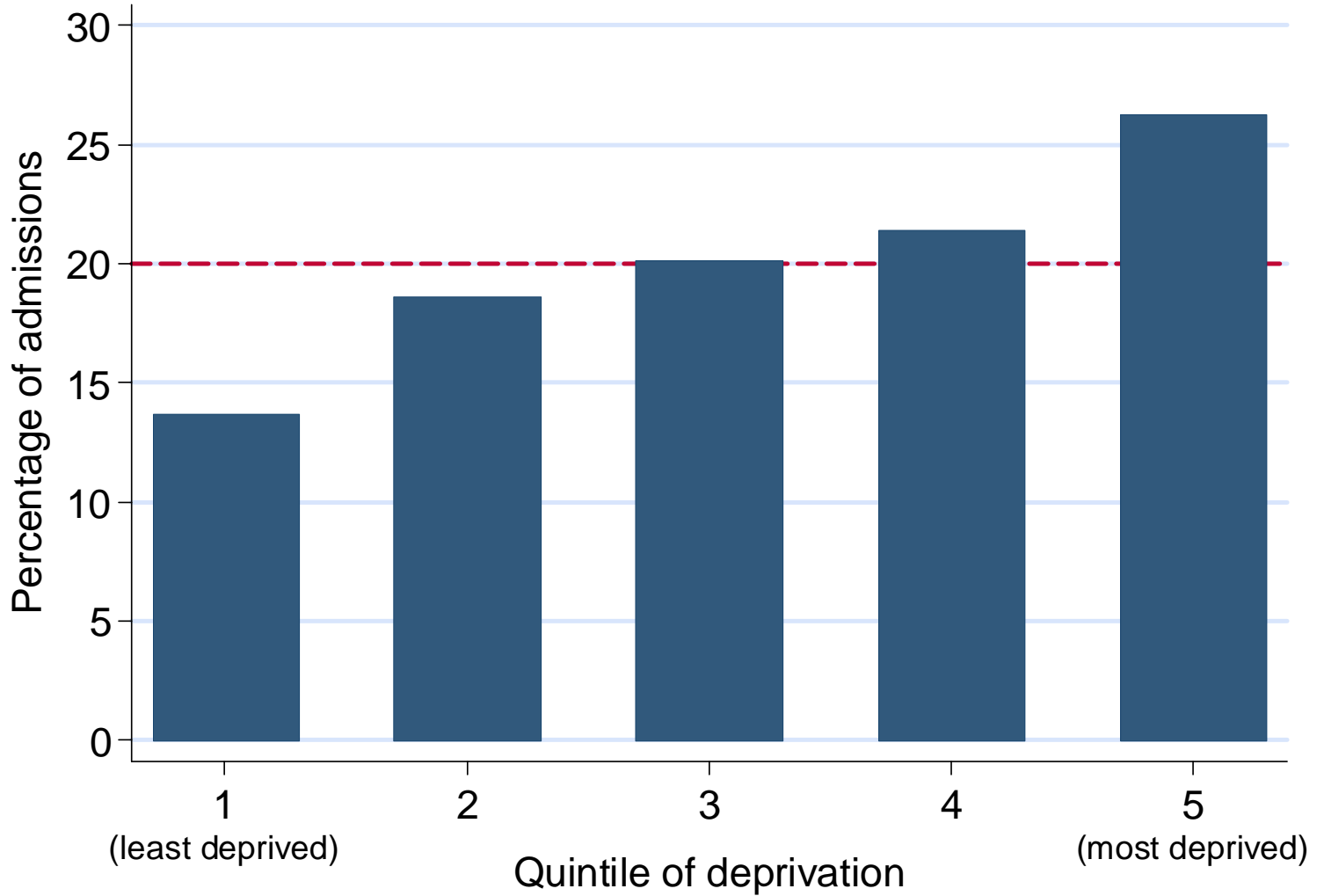


# Index of Multiple Deprivation (IMD)

- 2001 census in England
- 7 distinct dimensions of deprivation:  
“income”, “employment”, “health and disability”,  
“education, skills and training”, “barriers to housing and  
services”, “living environment” and “crime”
- IMD scores are weighted and aggregated  
for an area (1,500 households).
- Area IMD scores are grouped into  
quintiles by population:  
1-least deprived, 5-most deprived

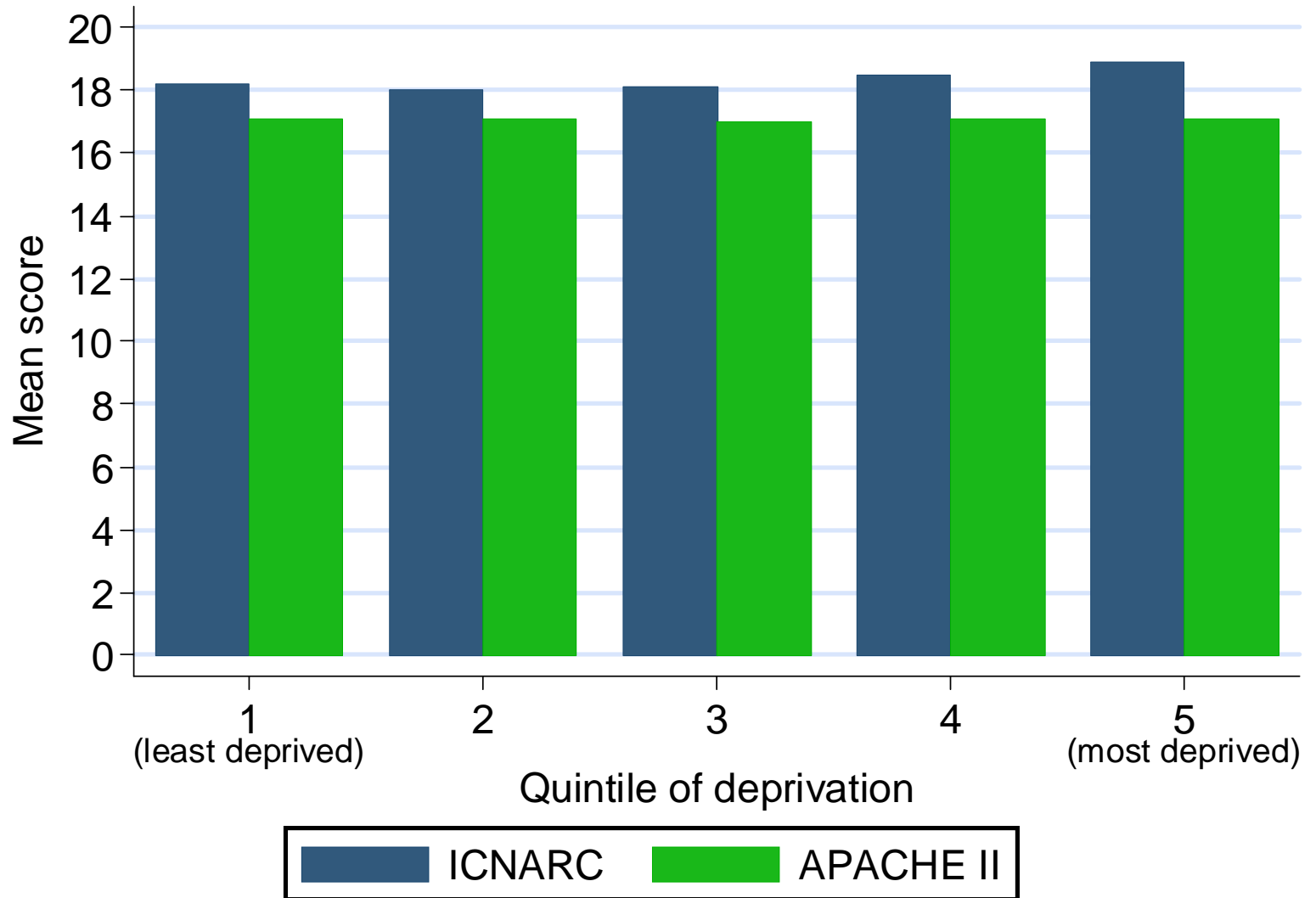


# Percentage of admissions



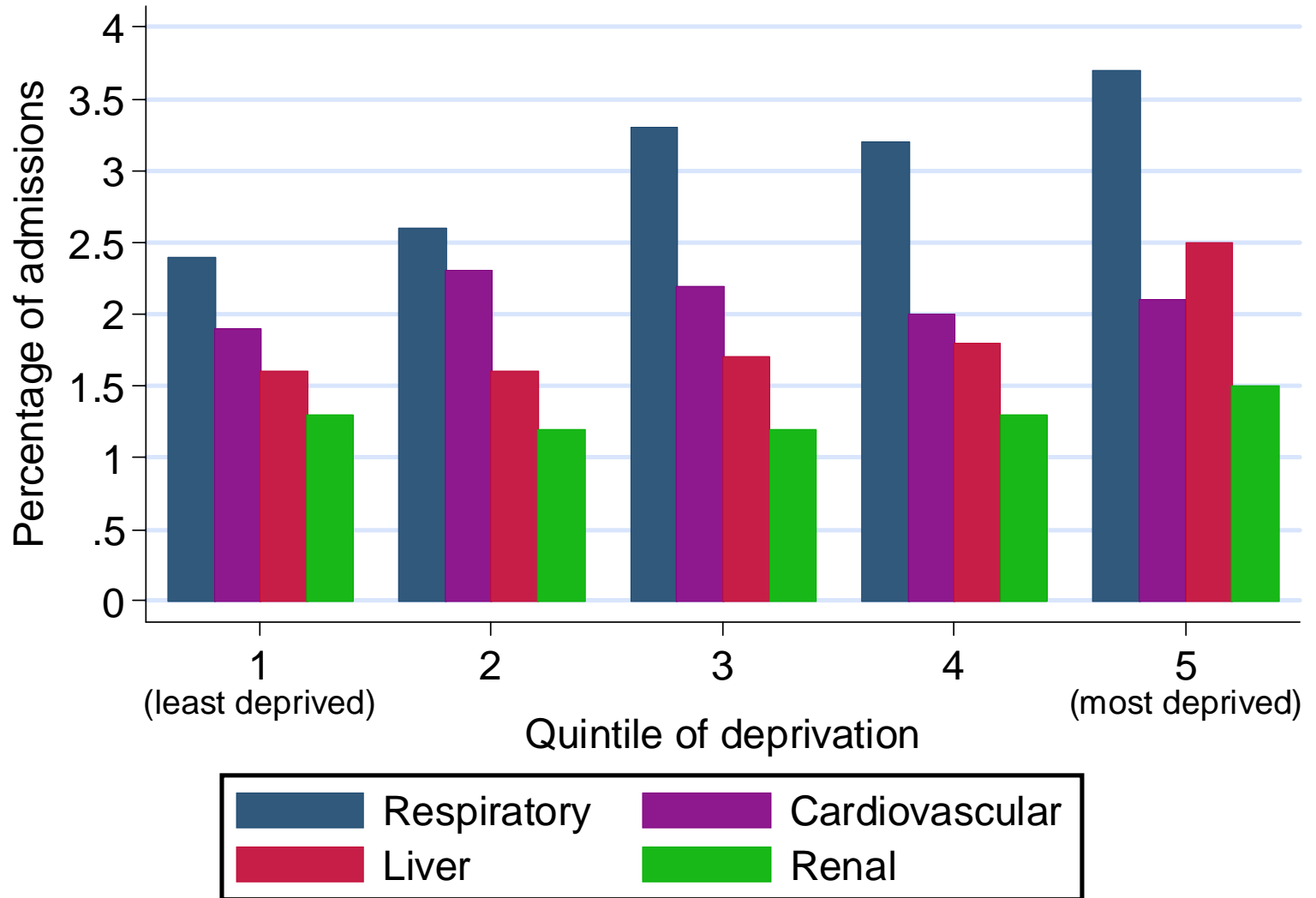


# Physiology scores



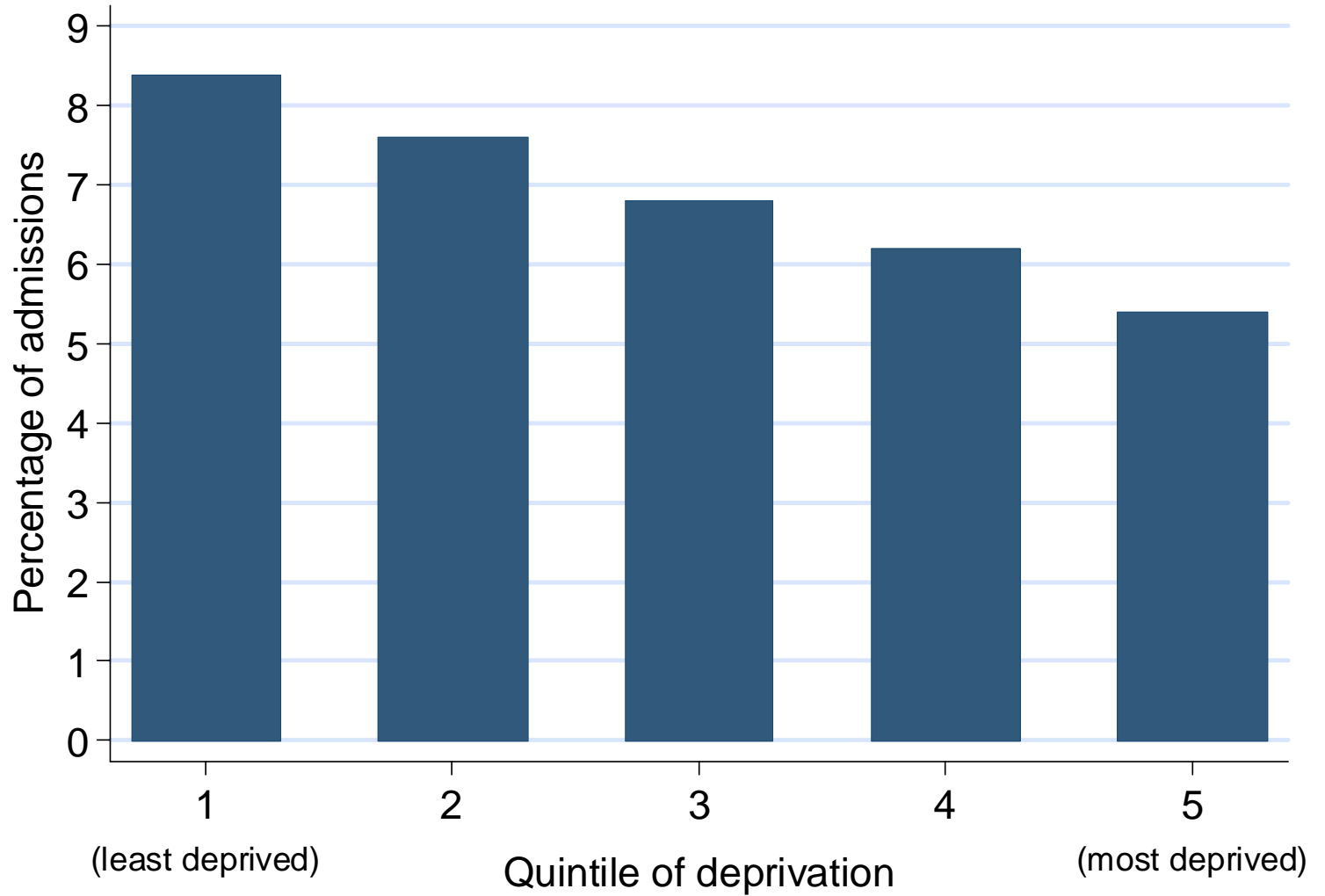


# Severe co-morbidity



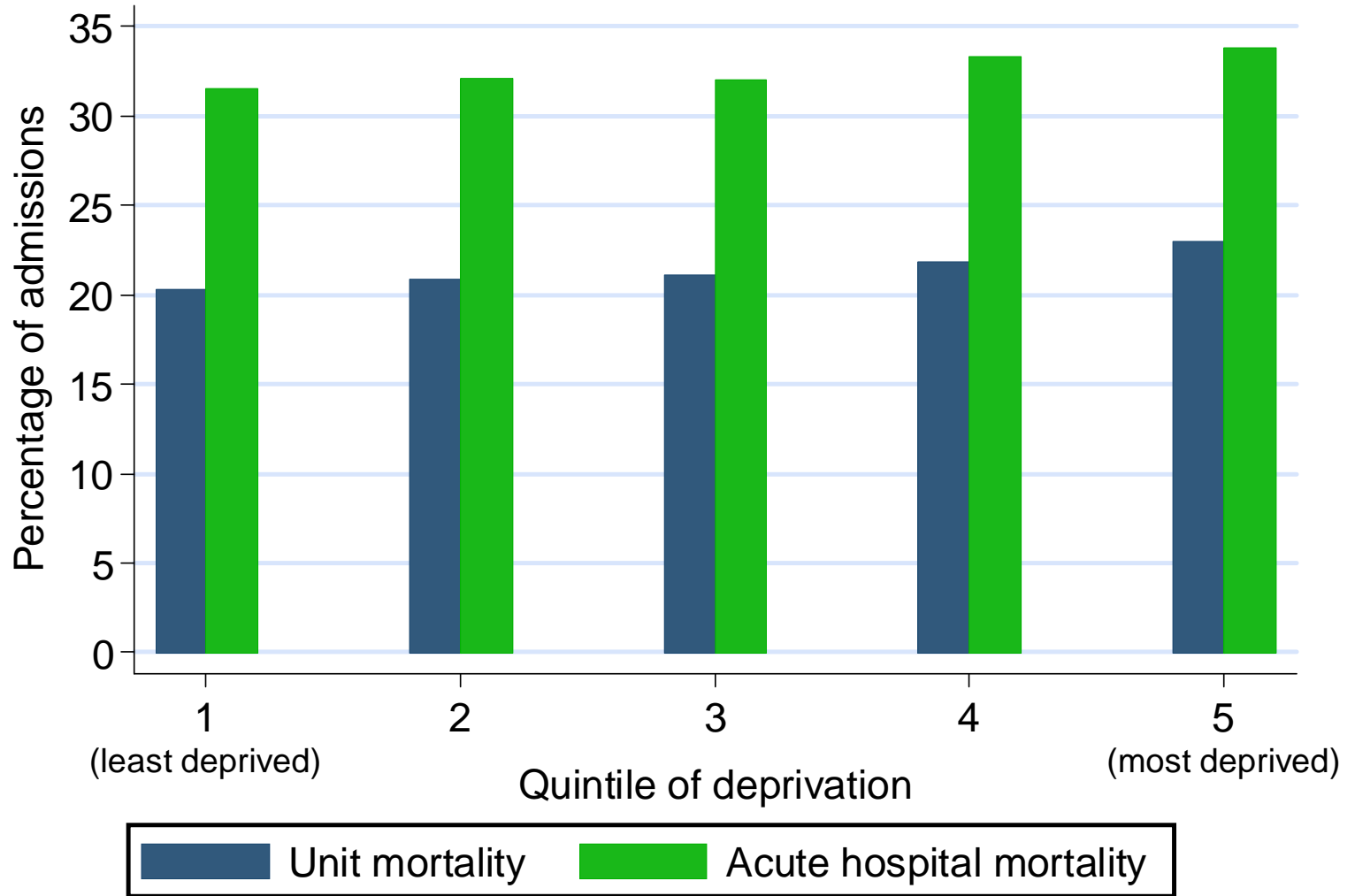


# Immunosupressed



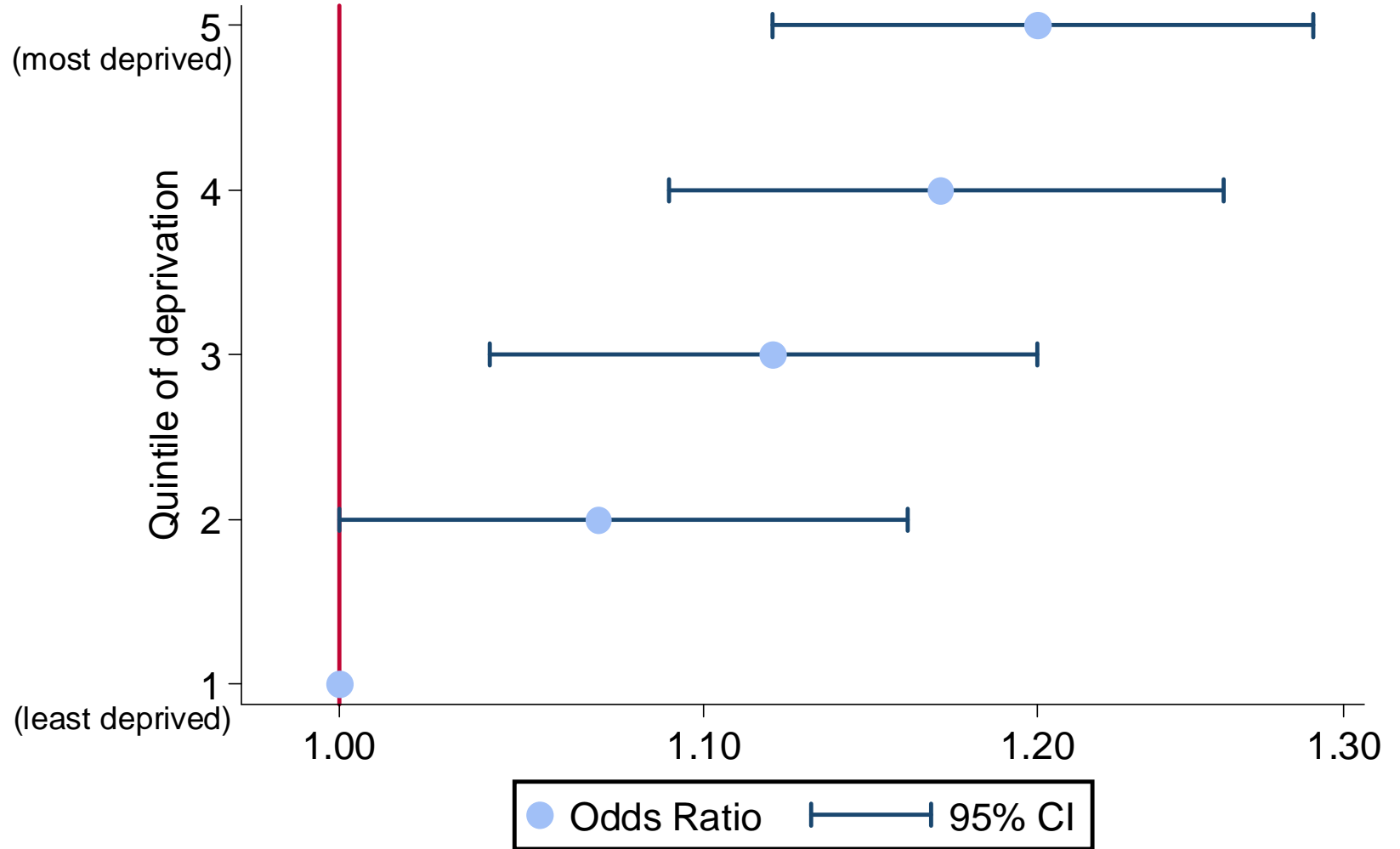


# Mortality





# Adjusted Odds Ratios for acute hospital mortality



## Completed research (ii)...

- Case mix/outcomes for: obstetric conditions, severe asthma, pneumonia, head injury, severe sepsis, high risk surgery, chronic renal conditions, acute pancreatitis, alcoholic liver disease, dermatological conditions, cardiac arrest, etc.
- Survivors' and family/close friends' experiences of adult critical care -> two modules on [www.healthtalkonline.org](http://www.healthtalkonline.org)

People's stories: see, hear and read their experiences...

Welcome

Healthtalkonline, an award-winning charity website, lets you share in other people's experiences of health and illness. You can watch or listen to videos of the interviews, read about people's experiences and find reliable information about conditions, treatment choices and support.

The information on healthtalkonline is based on qualitative research into patient experiences, led by experts at the University of Oxford. These personal stories of health and illness will enable patients, families and healthcare professionals to benefit from the experiences of others.

[How to use this site...](#)

Cancer

Nerves & brain

Mental health

Living with dying

Chronic health issues

Intensive care

Heart disease

Bones & joints

Pregnancy & children

Carers

Living with disability

A-Z of conditions

## Ongoing/new research (i)...

- Evaluating “modernisation” of critical care - **NIHR SDO**
- International comparisons of critical care (USUK)
- Fungal Infection Risk Evaluation (FIRE) - **NIHR HTA**
- Risk Adjustment In Neurocritical care (RAIN) - **NIHR HTA**
- Selective decontamination of the digestive tract (SuDDICU) - **Intensive Care Society**
- Hypoxia/Everest expedition

## Ongoing/new research (ii)...

- Optimisation of peri-operative cardiovascular management to improve surgical outcome (OPTIMISE) - NIHR+ICNARC
- Early parenteral versus enteral feeding (CALORIES) - NIHR HTA
- Protocolised management in severe sepsis (ProMISe) - NIHR HTA
- An evaluation of the feasibility, cost and value of information of a multicentre randomised controlled trial of intravenous immunoglobulin for severe sepsis - NIHR HTA

## Current research team...

- David Harrison - Senior Statistician
- Phil Restarick - Research Co-ordinator
- Andrew Craven/Nic Hawthorne - Research Administrators
- Gavin Eyres - FIRE Co-ordinator
- Gita Prabhu - RAIN Co-ordinator
- Bunsee Shah - Trial Manager (OPTIMISE)
- Rachael Scott - Trial Manager (CALORIES)
- Tiffany Osborn - Trial Clinician (ProMISe)
- Manu Shankar Hari - ICNARC Associate (IVIg)

## Goals...

- Promoting local audit of critical care through the provision of comparative data
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- Improving the quality of audit and research in critical care

## Collaborative working...

- Incorporate/promote CCMDs and member of- Critical Care Information Advisory Group
- Board member/advisor/member - e.g. UK TARN, PICANet, HQIP, etc.
- Co-investigator/Committee member - e.g. TracMan, OSCAR, BALTI-2, PARAMEDIC, CHIP, 6S, DAVROS, SuDDICU, etc.
- Data linkage - e.g. ICON, SICSAG, etc.
- Founding organisation in UKCCTF
- International collaborations e.g. CRISMA, ANZICS, CCCTG, InFACT, etc.

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- Promoting the use of evidence in critical care practice and policy

## Evidence into practice/policy...

- Feedback through national audit
- NICE e.g. Clinical Guideline 50
- Confidential enquiries  
e.g. NCEPOD, etc
- National Patient Safety Agency
- Critical Care Stakeholder Forum
- Critical Care Information Advisory Group
- Intensive Care Society - Council/SSQC/RC
- Expert e.g. for review of adult critical care services in Ireland, ANZICS CORE, etc.

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- Improving the quality of audit and research in critical care
- Promoting the use of evidence in critical care practice and policy
- Building research capacity in critical care

## Building research capacity...

- MSc support/MSc projects/Project Mgt.
  - Lucy Lloyd-Scott (PRINCE2 2006)
  - Cathy Welch (MSc 2008)
  - Petra Selmer (MSc 2008)

## PhDs...

- Simon Carmel (2003)
- Martin Wildman (2005)
- Sheila Harvey (2009)
- Wan Chin Lim (ongoing...)
- Kevin Bowrin (ongoing...)
- Naz Lone (ongoing...)
  
- plus five more just commencing...!

## Building research capacity...

- MSc support/MSc projects/Project Mgt.
  - Lucy Lloyd-Scott (PRINCE2 2006)
  - Cathy Welch (MSc 2008)
  - Petra Selmer (MSc 2008)
- ICNARC Associates approx. 12
- Last 60 publications - 101 non-ICNARC co-authors (77 clinical, 24 non-clinical)

## ICNARC the organisation (i)...

- Run by a quadrumvirate...
  - Keryn Vella - **Operations Director**
  - Lucy Lloyd-Scott - David Harrison
- Directors' supported by Emma Wood - **PA and Event Co-ordinator**
- From 13 to 24 staff (and still growing!)
- Office space - new meeting rooms (old meeting room now Trials Office...!)
- More "business" - Les Warnock
  - **Finance Manager**

## ICNARC the organisation (ii)...

- Improved HR procedures/policies/processes (7/7 -> Disaster Recovery Plan)
- Staff management training/team building
- 21<sup>st</sup> Century IT infrastructure - hardware/software/development of the ICNARC intranet
- New hosting company to provide secure web-based architecture for audit/research
- **Greener** ICNARC - recycle, reduce, reuse...

# Questions...???

