Illuminating the black box of high-dependency care

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Terminology

- Intermediate care
- Intermediate intensive care
- Step-down care
- High-dependency care
- Transitional care
- Respiratory weaning care

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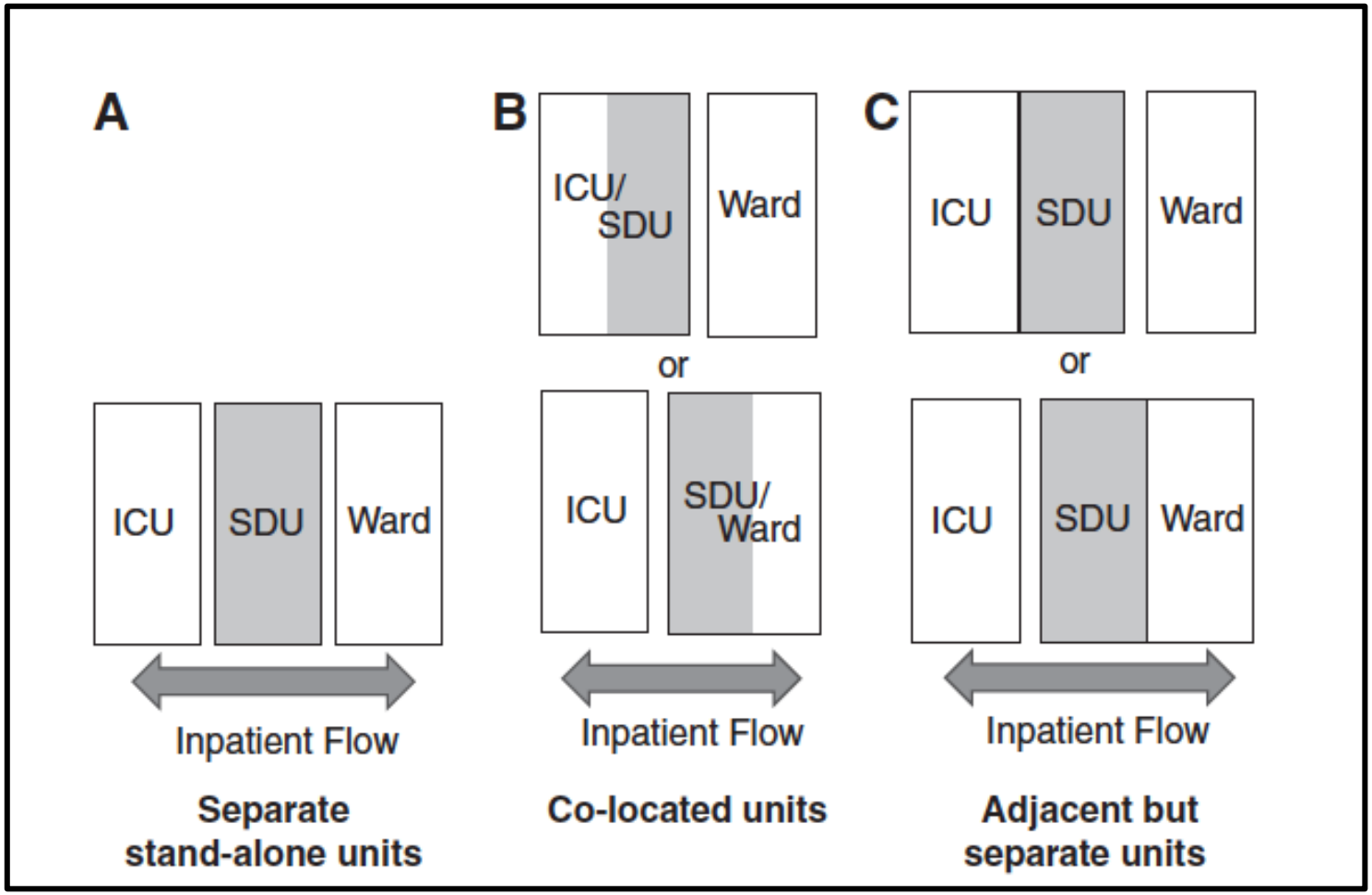
Traditional model of care options

ICU

Ward

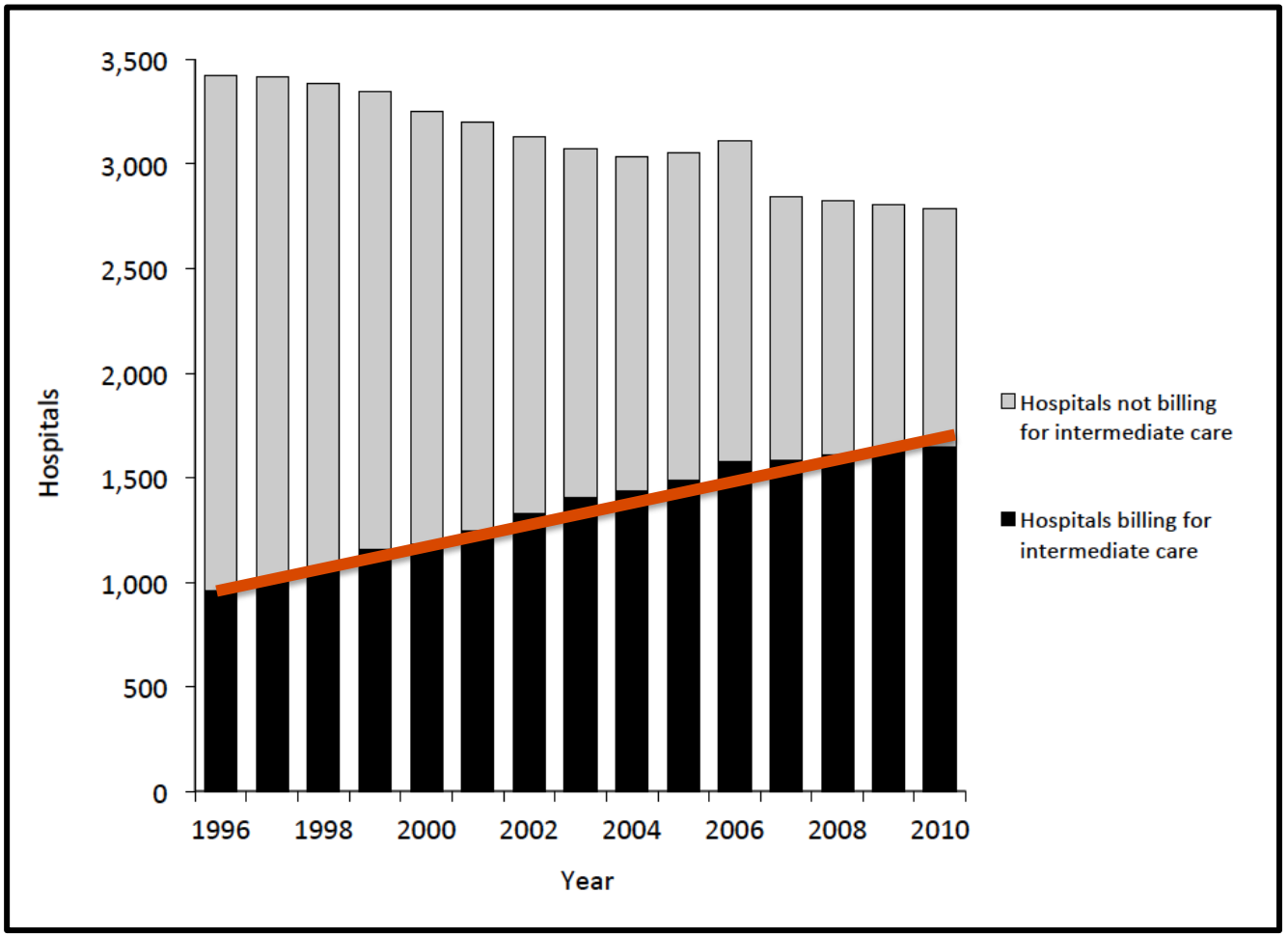
Real model of care options

IMC bed options



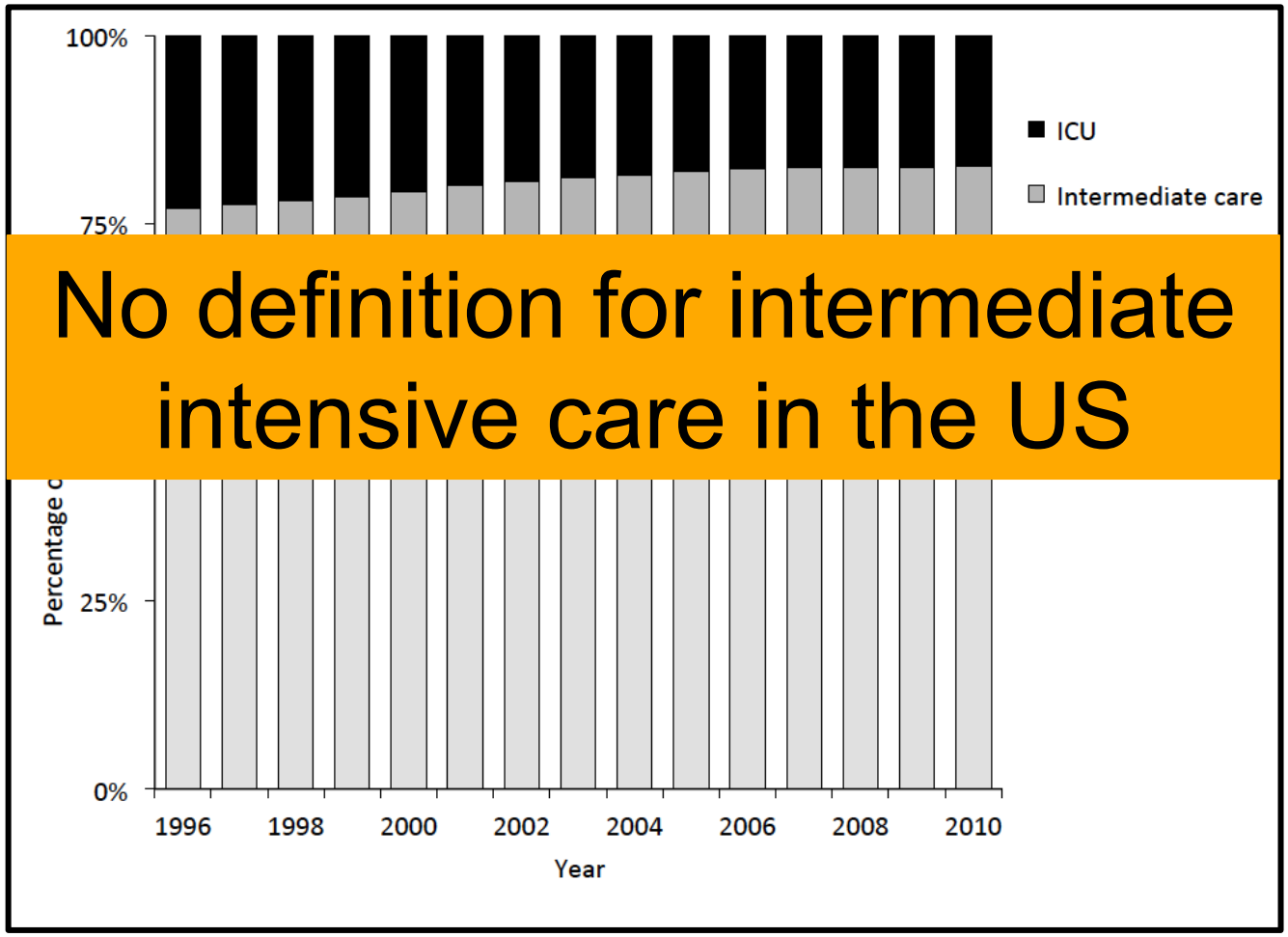
Prin & Wunsch *AJRCCM* 2014

Percentage of US hospitals billing for intermediate intensive care



Sjoding et al *AJRCCM* 2015

Percentage of patients receiving intermediate intensive care



No definition for intermediate intensive care in the US

Sjoding et al *AJRCCM* 2015

European data

Capuzzo *et al. Critical Care* 2014, **18**:551
http://ccforum.com/content/18/6/551

RESEARCH Open Access

Hospital mortality of adults admitted to Intensive Care Units in hospitals with and without Intermediate Care Units: a multicentre European cohort study

Maurizia Capuzzo[1*], Carlo Alberto Volta[1], Tania Tassinati[1], Rui Paulo Moreno[2], Andreas Valentin[3], Bertrand Guidet[4,5], Gaetano Iapichino[6], Claude Martin[7], Thomas Perneger[8], Christophe Combescure[8], Antoine Poncet[8], Andrew Rhodes[9] and on behalf of the Working Group on Health Economics of the European Society of Intensive Care Medicine

Capuzzo et al *Crit Care* 2014

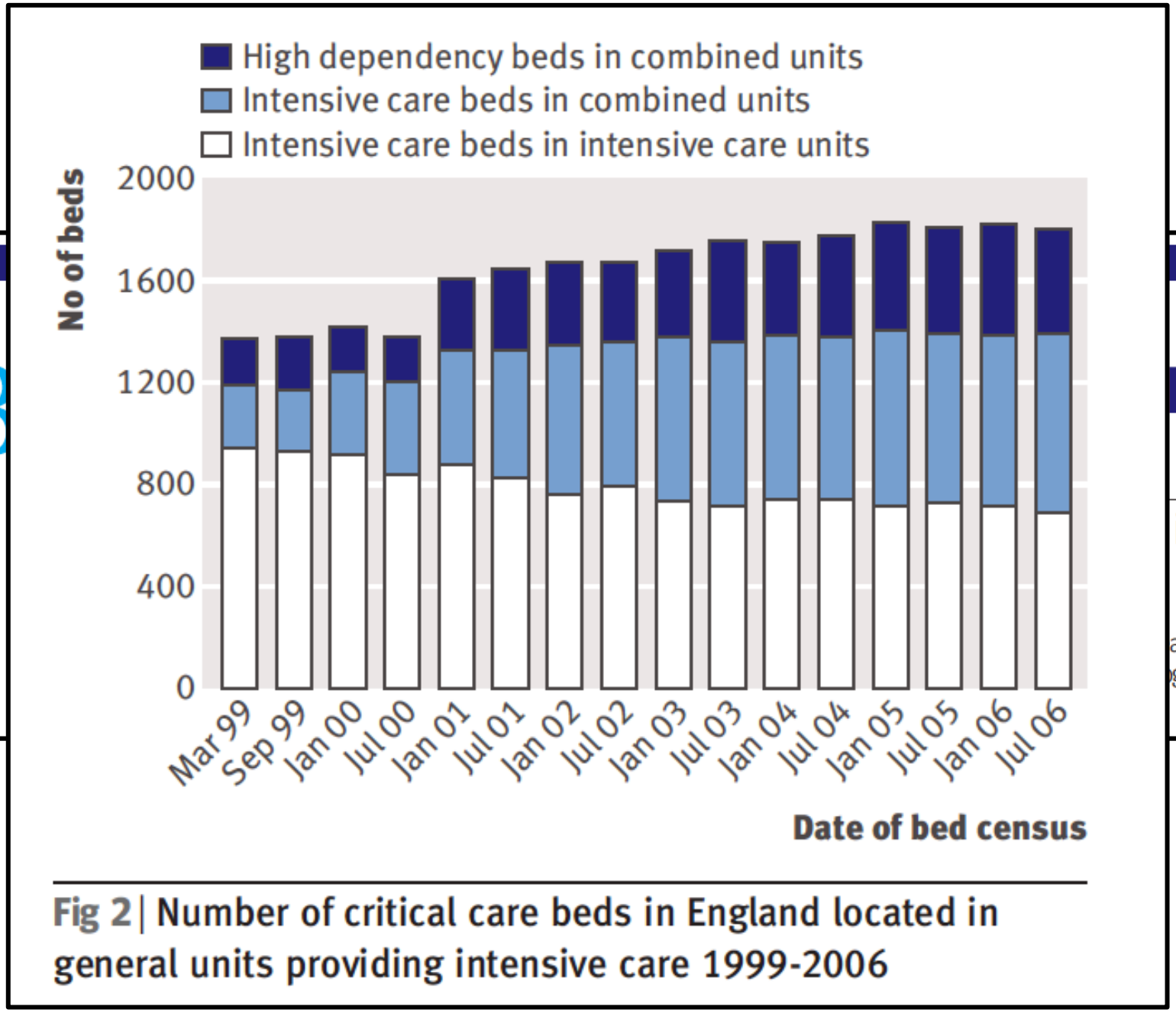


Fig 2 | Number of critical care beds in England located in general units providing intensive care 1999-2006

Hutchings et al *BMJ* 2009


THE OTHER WAY
THIS WAY
THAT WAY

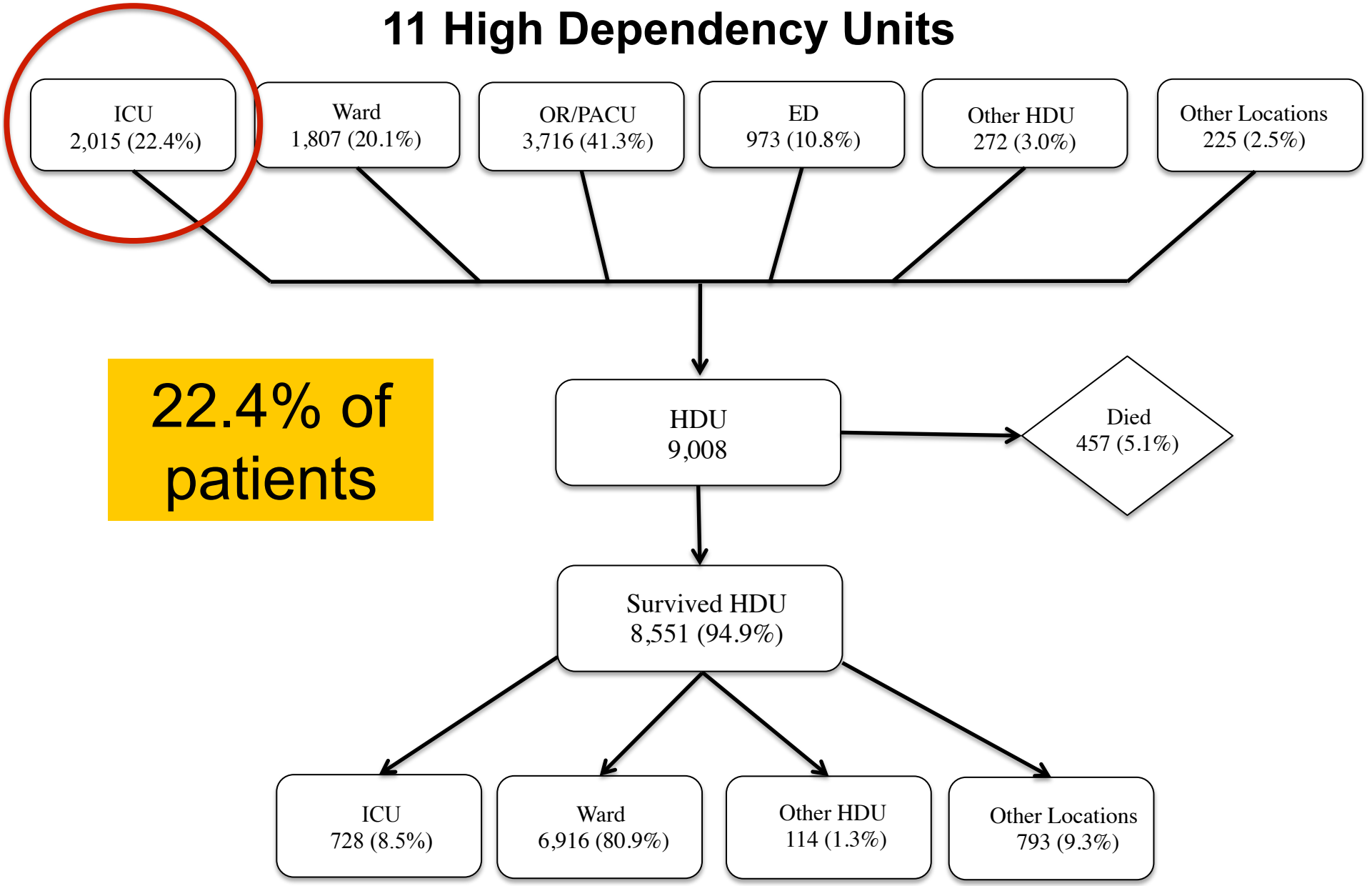
Two potential uses

- Transition patients out of the ICU
- Avoid use of an ICU bed altogether

Two potential uses

- **Transition patients out of the ICU**
- Avoid use of an ICU bed altogether

11 High Dependency Units



Prin et al *Intensive Care Med*, 2015

ORIGINAL ARTICLE

The Impact of the Organization of High-Dependency Care on Acute Hospital Mortality and Patient Flow for Critically Ill Patients

Hannah Wunsch[1,2,3], David A. Harrison[4], Andrew Jones[4,5], and Kathryn Rowan[4]

[1]Department of Critical Care Medicine, Sunnybrook Health Sciences Centre, Toronto, Ontario, Canada; [2]Department of Anesthesia, University of Toronto, Toronto, Ontario, Canada; [3]Department of Anesthesiology, College of Physicians and Surgeons, Columbia University, New York, New York; [4]Intensive Care National Audit and Research Centre, London, United Kingdom; and [5]Department of Intensive Care, Guy's and St Thomas's NHS Foundation Trust, King's Health Partners, London, United Kingdom

	Acute hospital mortality	Adjusted Odds Ratio	P value
Integrated HDU	19.0%	Ref	<0.001
"Dual" HDU	16.2%	0.94 (0.86-1.03)	0.16

Wunsch et al *AJRCCM* 2015

Night discharges, Readmissions, Delayed discharges

	Integrated HDU	Separate HDU	P value
Night discharges (22:00 to 06:59)	8.1%	14.5%	<0.001
Readmissions to primary unit	5.7%	6.9%	<0.001
Delayed discharge from primary unit	19.9%	10.8%	<0.001

American Journal of Respiratory and Critical Care Medicine Volume 191 Number 2 | January 15 2015

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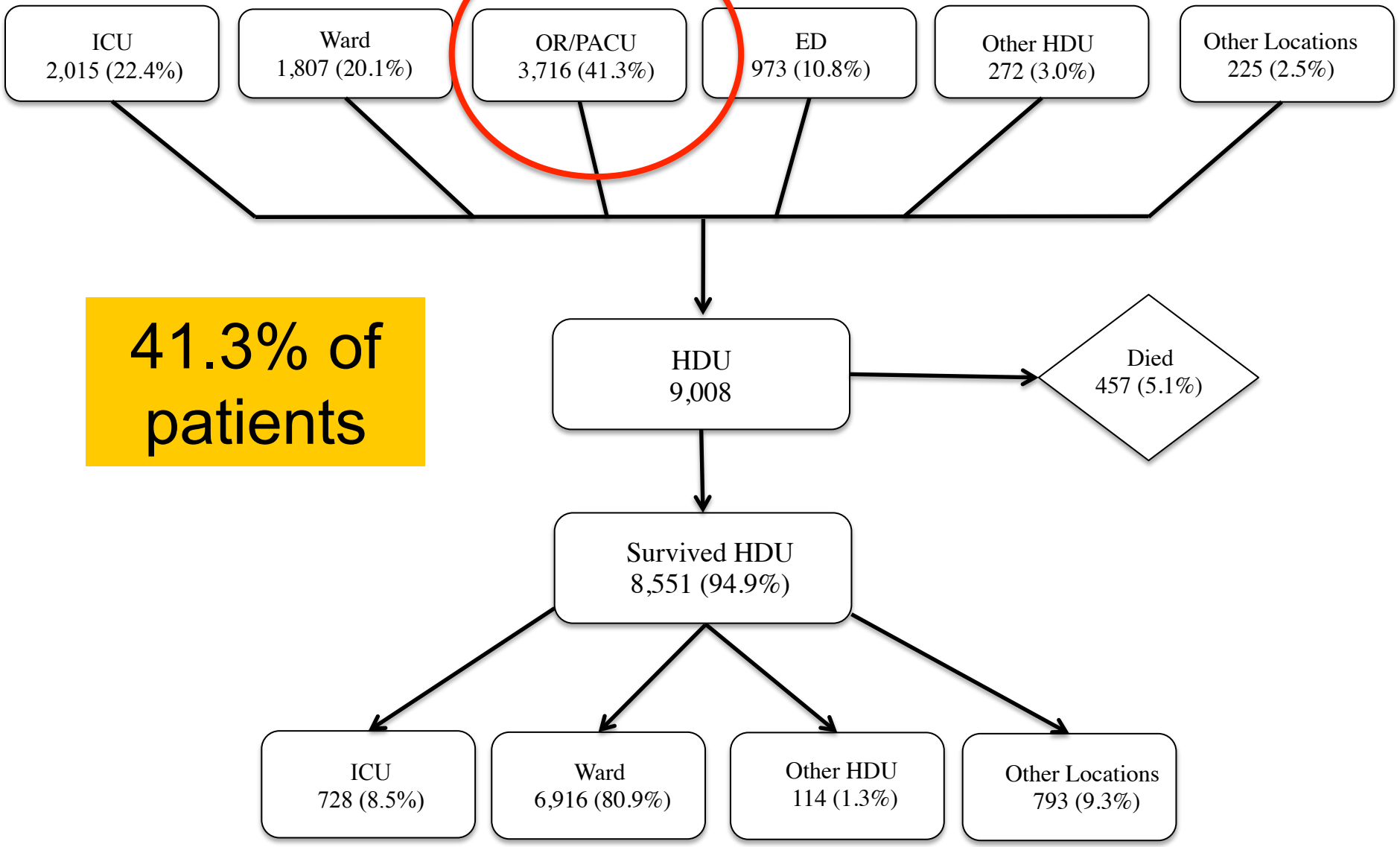
Patient perspective?

Two potential uses

- Transition patients out of the ICU

- **Avoid use of an ICU bed altogether**

11 High Dependency Units



Prin et al *Intensive Care Med,* 2015

UNTIL P

RY 2016

MONTHLY CRITICAL

GENT OPERATIONS

Month	Urgent Operations Cancelled
January 2014	261
February 2014	244
March 2014	232
April 2014	228
May 2014	241
June 2014	210
July 2014	261
August 2014	265
September 2014	246
October 2014	301
November 2014	319
December 2014	408
January 2015	396
February 2015	375
March 2015	317
April 2015	318
May 2015	320
June 2015	266
July 2015	296
August 2015	274
September 2015	309
October 2015	378
November 2015	244
December 2015	332
January 2016	293

Increasing use of NIV

British Journal of Anaesthesia **109** (3): 305–14 (2012)
doi:10.1093/bja/aes270

BJA

REVIEW ARTICLES

Non-invasive ventilation for weaning, avoiding reintubation after extubation and in the postoperative period: a meta-analysis

A. J. Glossop[1*], N. Shepherd[2], D. C. Bryden[3] and G. H. Mills[3]

[1] NICE Scholar 2010 and Department of Critical Care, Sheffield Teaching Hospitals NHS Foundation Trust, Herries Road, Sheffield S5 7AU, UK
[2] School of Health and Related Research (ScHARR), University of Sheffield, Regent Court, 30 Regent Street, Sheffield S1 4DA, UK
[3] Department of Critical Care, Sheffield Teaching Hospitals NHS Foundation Trust, Herries Road, Sheffield S5 7AU, UK

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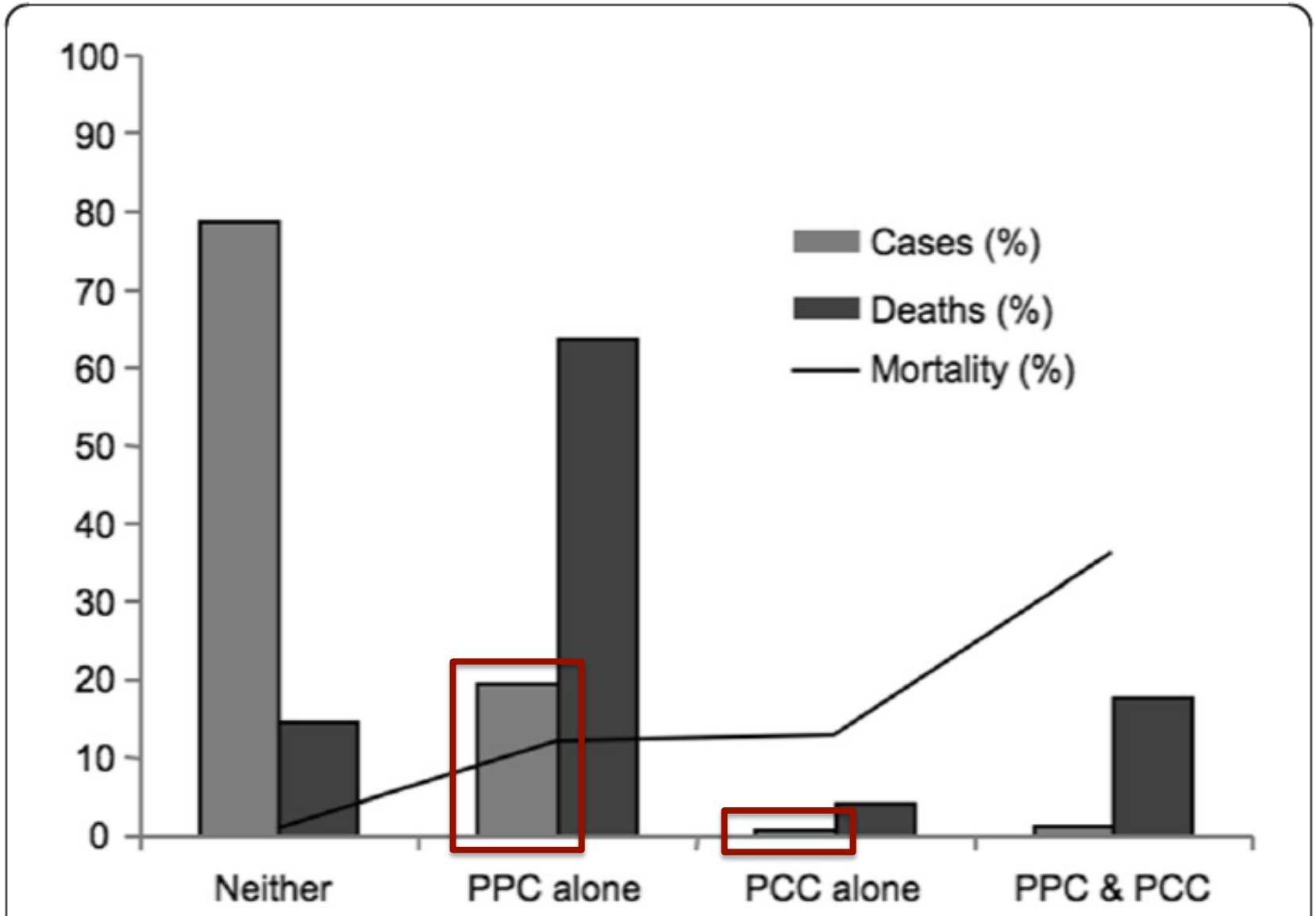


Figure 1 Incidence, case distribution, and mortality for postoperative complication groups.

Allow for “rescue”

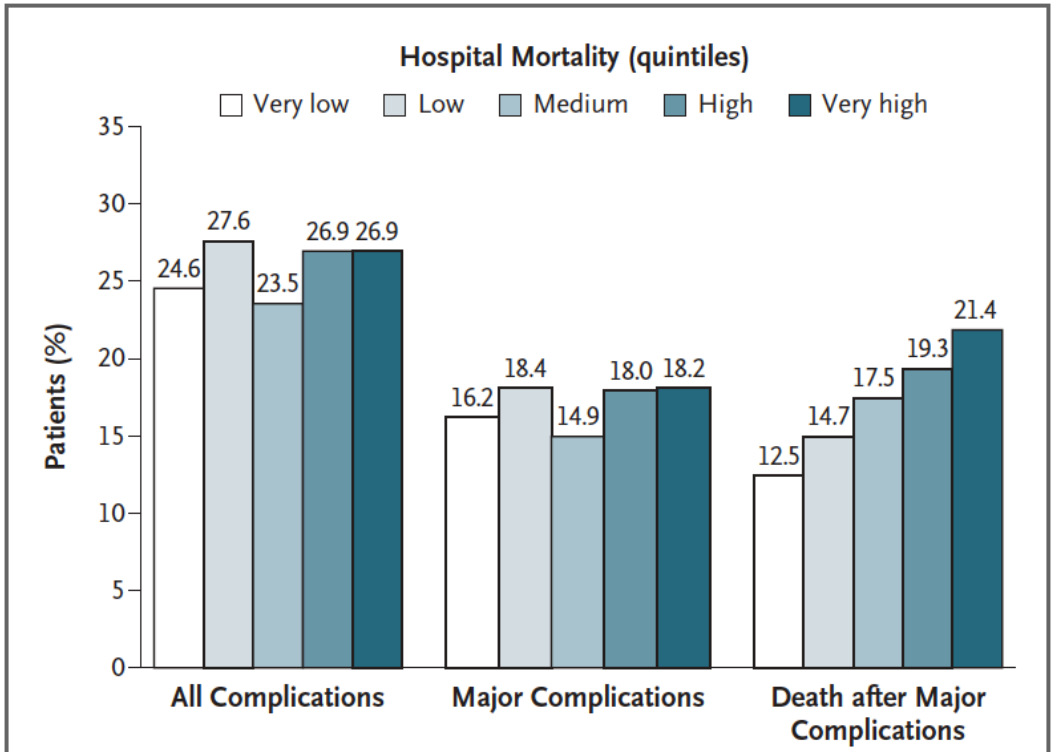


Figure 1. Rates of All Complications, Major Complications, and Death after Major Complications, According to Hospital Quintile of Mortality.

Although rates of all complications and major complications did not vary significantly across hospital mortality quintiles, the rate of death in patients with major complications was almost twice as high in hospitals with very high overall mortality as in those with very low overall mortality (21.4% vs. 12.5%, P<0.001).

Ghaferi et al *NEJM 2009*

11 HDUs in the UK

Most common admission diagnoses		Basic organ support during HDU stay[b]	
Medical patients (n=5,337)	N (%)		N (%)
Infection	1,204 (22.6)	Respiratory	2,988 (56.0)
Trauma	764 (14.3)	Cardiovascular	4,154 (77.8)
Obstruction	609 (11.4)	Renal	90 (1.7)
Elective surgical patients (n=2,692)			
Obstruction	1,822 (47.2)	Respiratory	1,054 (39.2)
Tumour or malignancy	1,176 (43.7)	Cardiovascular	2,190 (81.4)
Miscellaneous[a]	298 (11.1)	Renal	12 (0.5)
Emergency surgical patients (n=979)			
Trauma	251 (25.6)	Respiratory	440 (44.9)
Obstruction	251 (25.6)	Cardiovascular	824 (84.2)
Tumour or malignancy	103 (10.5)	Renal	2 (0.2)

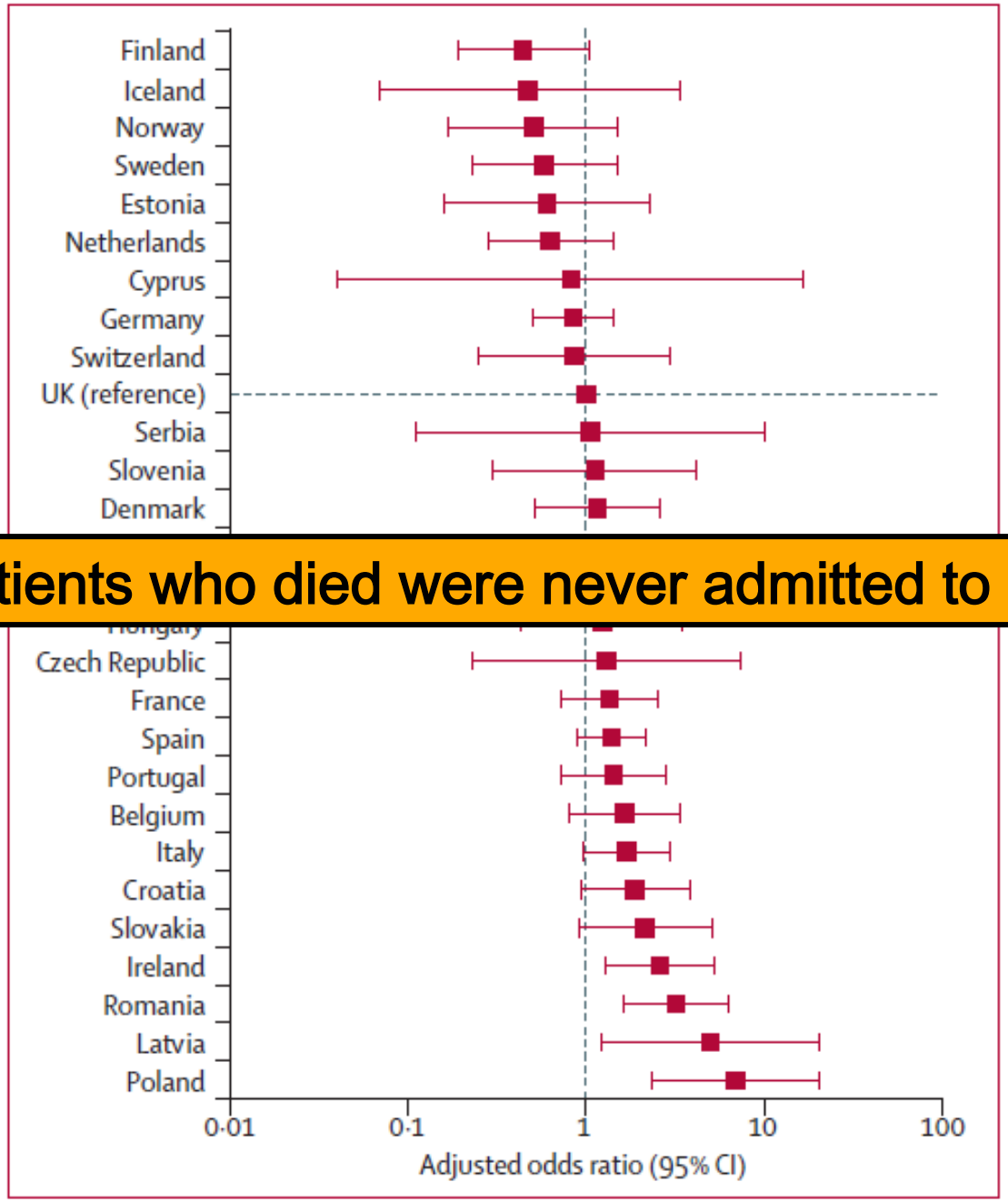
Prin et al *ICM* 2015

Mortality

Rupert M Pearse, Rui P M
Andrew Rhodes, for the E
and the European Society

Summary
Background Clinical

t 2012; 380: 1059–65



73% of patients who died were never admitted to an "ICU"

Figure 3: Adjusted odds ratio for death in hospital after surgery for each country

Unexpected findings & unanswered questions

- Mortality
- Length of stay
- Costs
- Staffing

Changes in Intensive Care Unit Performance Measures Associated With Opening a Dedicated Thoracic Surgical Progressive Care Unit

Mark T. Keegan, MB, MRCPI,* Daniel R. Brown, MD, PhD, FCCM,* Michael P. Thieke, RN, NM,† and Bekele Afessa, MD‡

Table 3. Mortality Performance Measures

Variables	Observed	Customized Predicted	SMR (95% CI)
ICU mortality (%)			
Pre-PCU	1.14	1.68	0.681 (0.47-0.96)
Post-PCU	7.27	6.07	1.198 (0.96-1.47)
Hospital mortality (%)			
Pre-PCU	2.89	3.48	0.830 (0.66-1.03)
Post-PCU	11.90	9.58	1.242 (1.05-1.46)

Journal of Cardiothoracic and Vascular Anesthesia, Vol 22, No 3 (June), 2008: pp 347-353

Anaesth Intensive Care 2006; **34:** 457-463

Outcomes Following a Shortage of High Dependency Unit Beds for Surgical Patients

D. R. McILROY*, B. D. COLEMAN†, P. S. MYLES‡

Department of Anaesthesia and Pain Management, Alfred Hospital, Melbourne, Victoria, Australia

TABLE 2

Hospital length-of-stay

	HDU	No HDU	*P* value
Hospital length-of-stay			
median	14.5	7.5	0.004
Log length-of-stay			
mean (SD)	14.3 (2.2)	8.1 (3.2)	0.007
Excluding patients with obstructive sleep apnoea			
Hospital length-of-stay			
median	13.5	8.5	0.01
Log length-of-stay			
mean (SD)	13.1 (2.1)	8.2 (2.5)	0.017
All patients			
Day 1 QoR score			
mean (SD)	13.5 (2.4)	14.9 (2.1)	0.01

Research

Open Access

Changes in hospital costs after introducing an intermediate care unit: a comparative observational study

Barbara CJ Solberg[1], Carmen D Dirksen[2], Fred HM Nieman[2], Godefridus van Merode[3], Martijn Poeze[4] and Graham Ramsay[4,5]

Critical Care 2008, **12**:R68

Results The mean total hospital cost per patient increased significantly.

Conclusion After the introduction of the IMC, the higher mean total hospital costs for patients with a high TISS score and longer ICU stay explained the cost increase.

Key Message #3: "Optimal size and utilisation of the IMC may reduce the total hospital cost per patient"

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	Acute hospital mortality	Adjusted Odds Ratio	P value
Intensivists	18.5%	1.06 (0.93-1.22)	0.39
Non-intensivists	15.2%	0.88 (0.78-1.00)	0.054
Combined	14.3%	0.81 (0.68-0.96)	0.016

Wunsch et al *AJRCCM* 2015

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Shared	14.3%	**0.81 (0.68-0.96)**	**0.016**

Wunsch et al *AJRCCM* 2015

Other options for care

- PACU
- Recovery room
- Observation unit
- Ward
- ICU
- ”Level 1” or other intermediate care

*****Nursing******

Conclusions – intermediate care

- Understudied
  - Terminology
  - Varied configurations of beds
- For ICU patients:
  - Trade-offs
- ’Systems’ outcomes:
  - Mixed

Intermediate Care

Thank you!

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