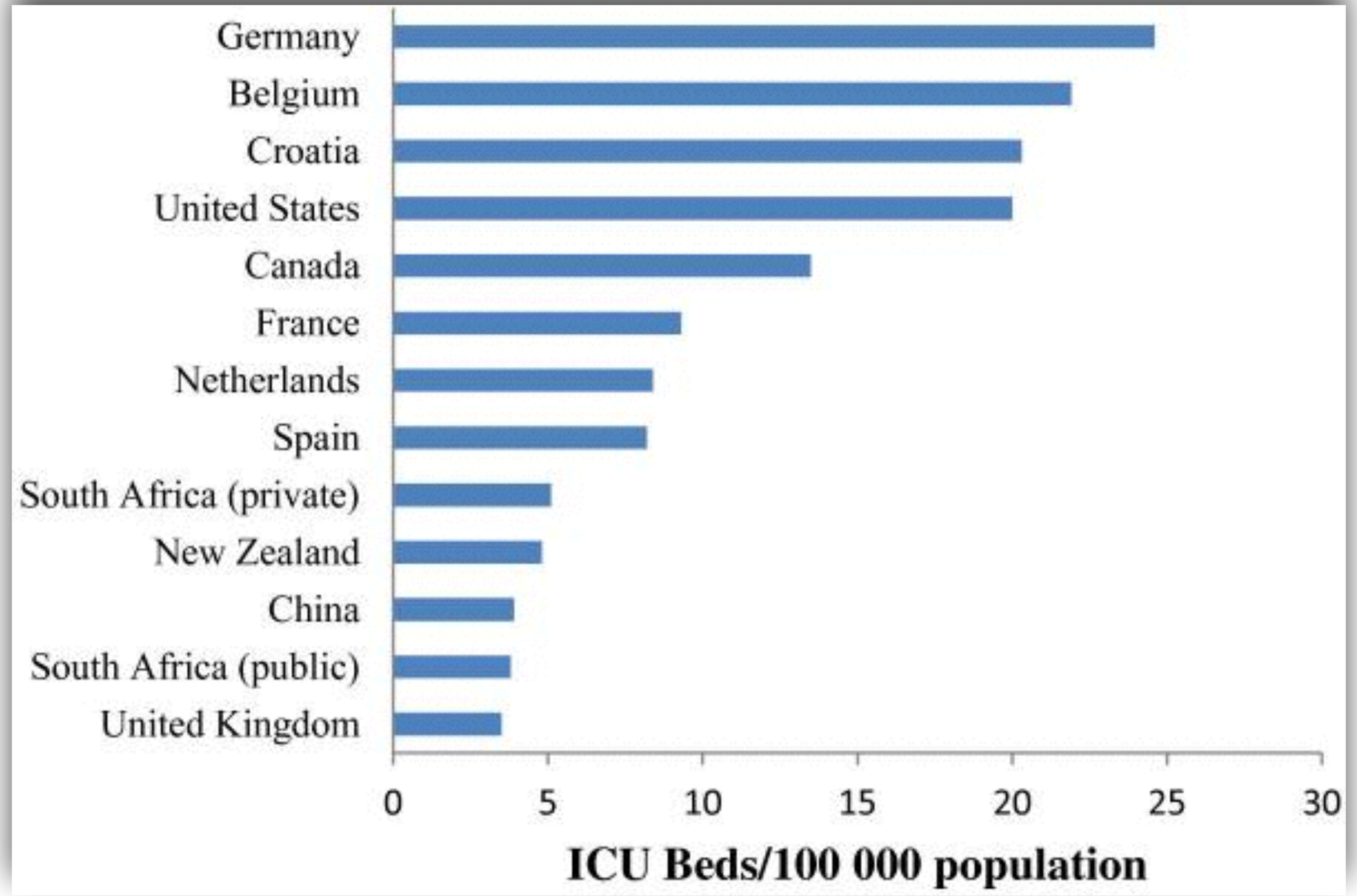
WEANING THE LONG-TERM ICU PATIENT

Dr Michael Davies MD FRCP FFICM
Respiratory Support and Sleep Centre
Papworth Hospital NHS Foundation Trust
Cambridge

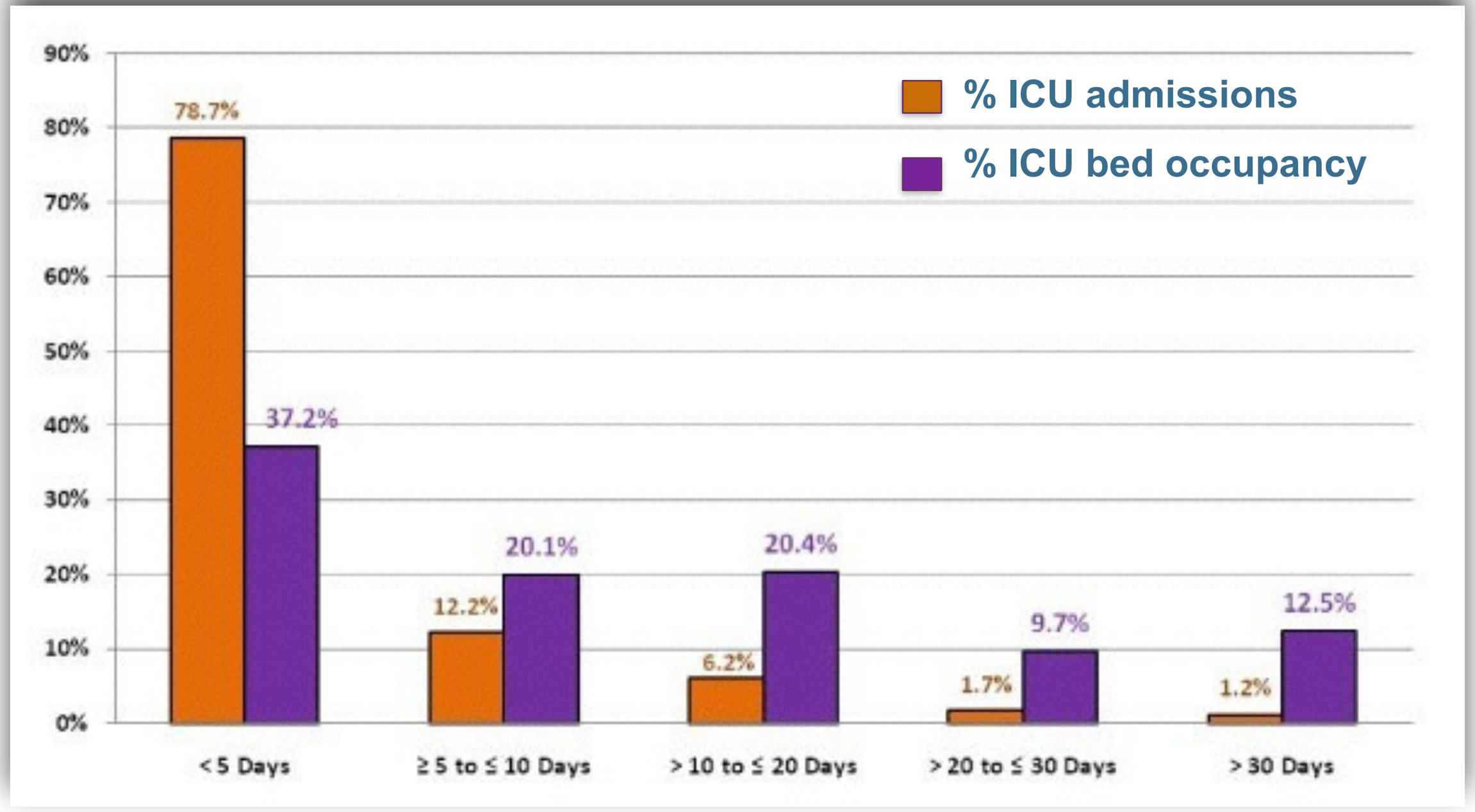
michael.davies@papworth.nhs.uk

ICU DEMOGRAPHICS
BED AVAILABILITY



Murthy & Wunsch Crit Care. 2012; 16(2): 218

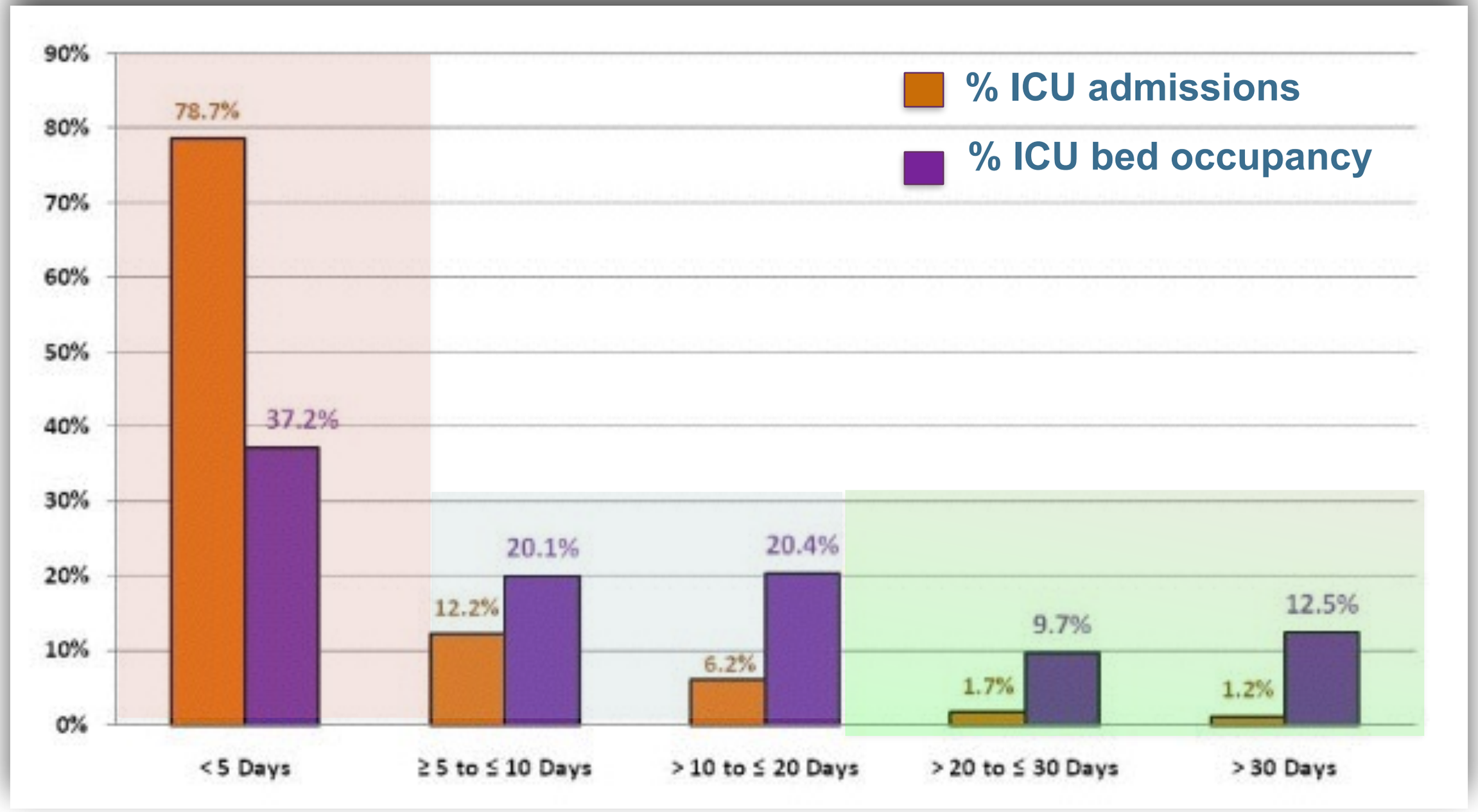
ICU DEMOGRAPHICS
LENGTH OF STAY AND BED OCCUPANCY



Kramer and Zimmerman *BMC Medical Informatics and Decision Making* 2010, 10:27


BIRMINGHAM INTERNATIONAL AIRPORT (BHX)
TERMINAL 1
Multi-Storey Parking 1
Hotel
Short Stay
Multi-Storey Parking 3
Multi-Storey Parking 2
Coach Parking
Car Hire Pick-up & Return
TERMINAL 2
A45 to M42 Junction 6
Long Stay Parking 1
Long Stay Parking 2
N
Terminal Buildings
Parking
Roads
A45 to Birmingham City Centre

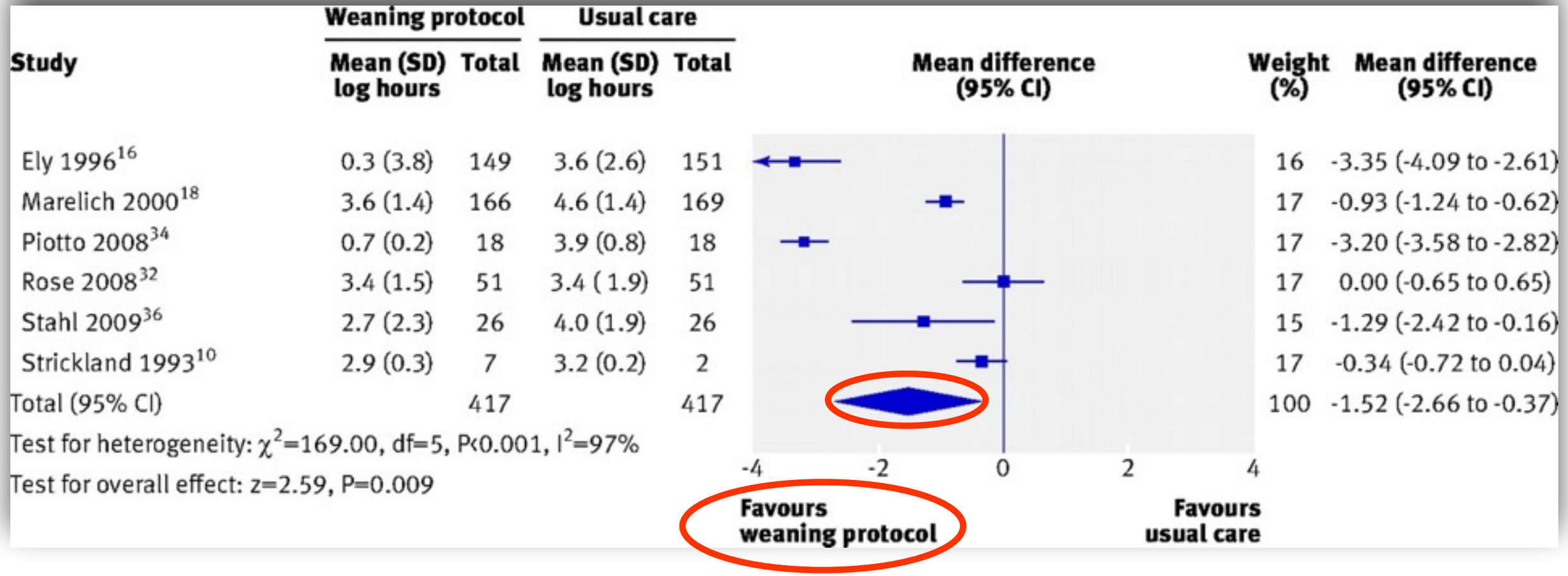
ICU DEMOGRAPHICS
LENGTH OF STAY AND BED OCCUPANCY



Kramer and Zimmerman *BMC Medical Informatics and Decision Making* 2010, 10:27

WEANING PROTOCOLS

Shorter duration of ventilation



Blackwood B et al. *BMJ* 2011

ACTIVE PROMPTING?

Nursing:	MICU ROUNDING CHECKLIST - PG 1														
Patient: Date:															
Date of Admission: ROOM NO:															
ICU DAY	A	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Lines and Tubes bundle	Give initial date and day number														
Central Line 1; Site/type/insertion date:_____															
Central Line 2; Site/type/insertion date:_____															
Arterial Line; Site/insertion date: _____															
Rectal tube															
Other:_____															
Patient care bundle	Check = yes														
Appropriate stool within past 24 hrs															
Any glucose > 140															
Restraints															
Foley															
Weight															
Nutrition:															
Nutrition goal rate: % of goal _____															
Pressure Ulcer--LOCATION: STAGE:															
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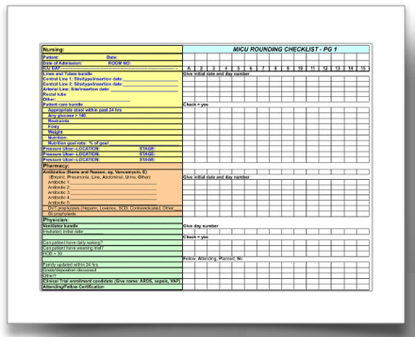
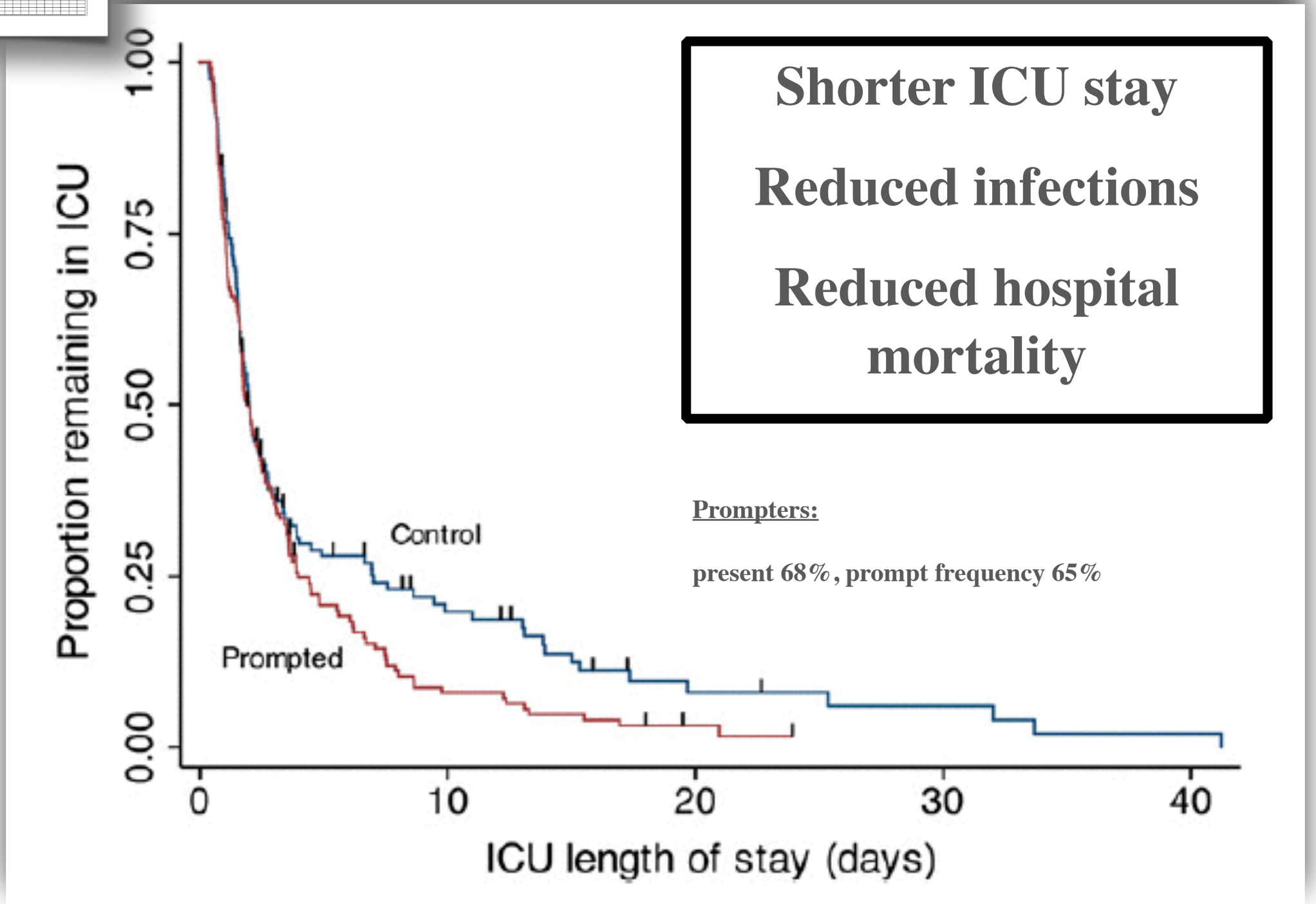
Pharmacy:															
Antibiotics (Name and Reason, eg. Vancomycin, E)															
(Empiric, Pneumonia, Line, Abdominal, Urine, Other)	Give initial date and day number														
Antibiotic 1:_____															
Antibiotic 2:_____															
Antibiotic 3:_____															
Antibiotic 4:_____															
Antibiotic 5:_____															
DVT prophylaxis (Heparin, Lovenox, SCD, Contraindicated, Other:__															
GI prophylaxis															
Physician:															
Ventilator bundle	Give day number														
Intubated; initial date:_____															
	Check = yes														
Can patient have daily waking?															
Can patient have weaning trial?															
HOB > 30															
	Fellow, Attending, Planned, No														
Family updated within 24 hrs															
Goals/disposition discussed															
Other?															
Clinical Trial enrollment candidate (Give name: ARDS, sepsis, VAP)															
Attending/Fellow Certification															

Weiss et al *AJRCCM* 2011 184; 680-686



ACTIVE PROMPTING?



Shorter ICU stay

Reduced infections

Reduced hospital mortality

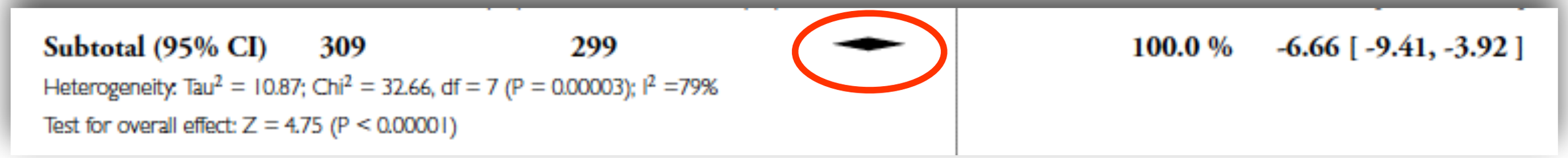
Prompters:

present 68%, prompt frequency 65%

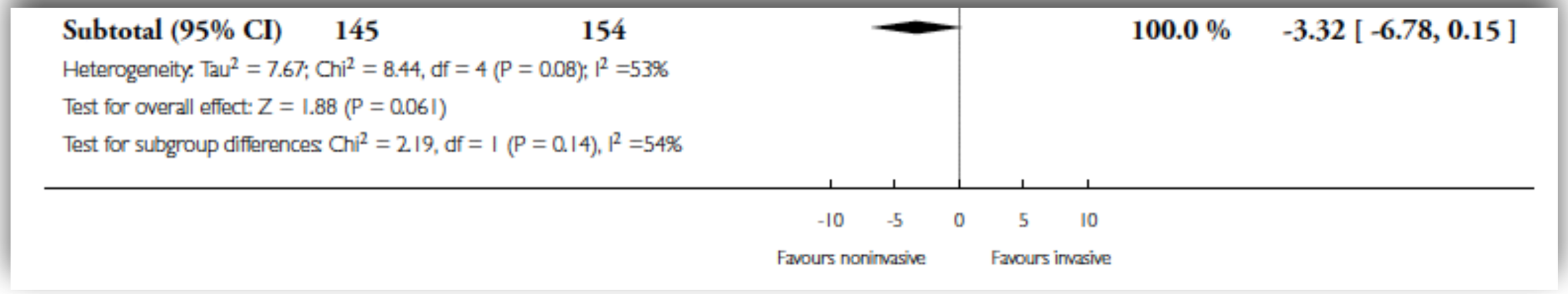
Weiss et al *AJRCCM* 2011 184; 680-686

USE OF NON-INVASIVE VENTILATION TO FACILITATE EXTUBATION

COPD: 8 trials. ICU LOS 8-25 days



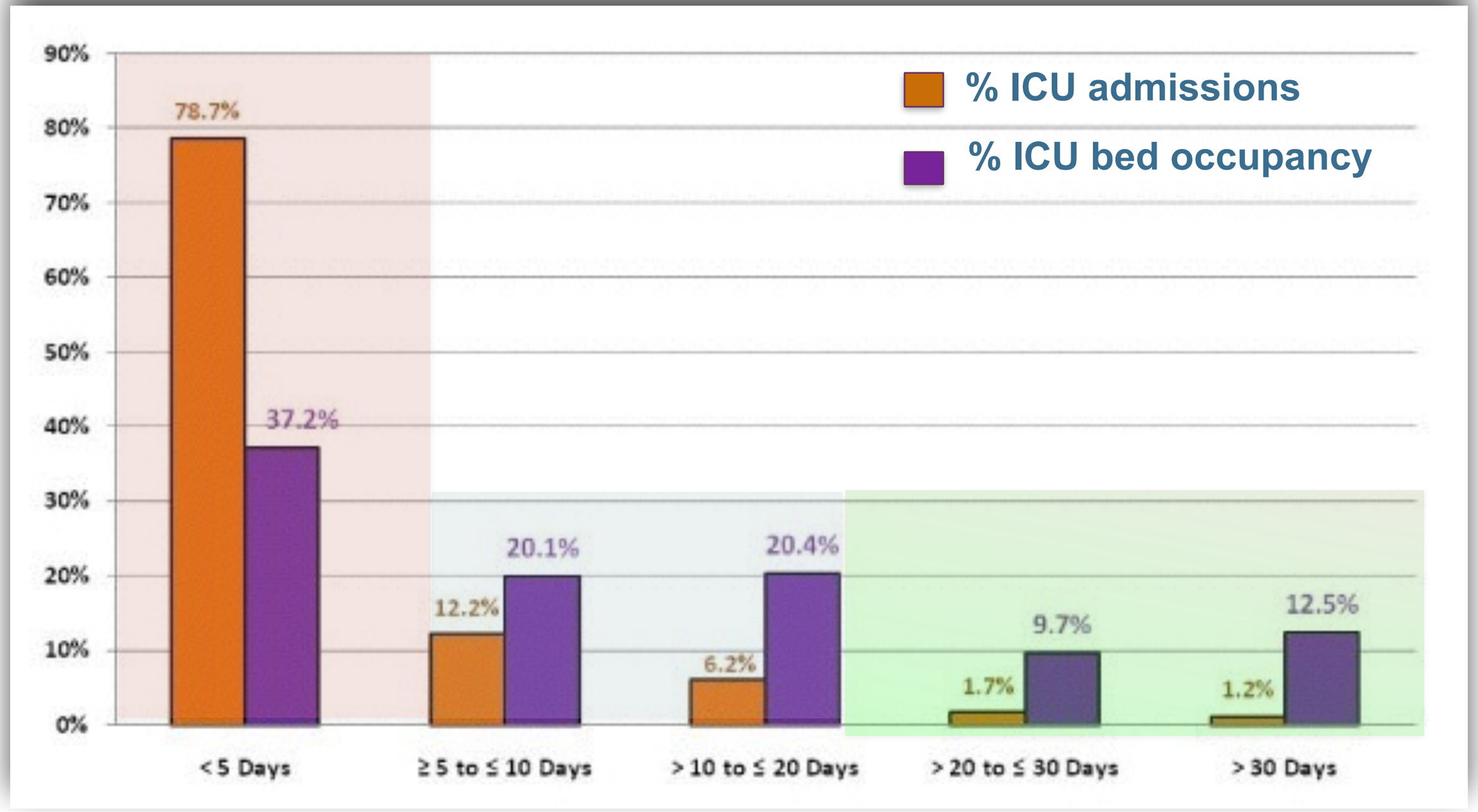
Mixed: 5 trials. ICU LOS 10-25 days



NIV can help if there is a sensible reason for its use

Burns KE et al Cochrane Database Syst Rev. 2013 Dec 9;12:CD004127

ICU DEMOGRAPHICS
LENGTH OF STAY AND BED OCCUPANCY



Kramer and Zimmerman *BMC Medical Informatics and Decision Making* 2010, 10:27

OPTIONS IN THE EVENT OF WEANING FAILURE

- **Continue in critical care**
- Not escalate again in the event of a further deterioration
- Formally withdraw therapy
- Refer to a step-down unit (e.g. Long-Term Acute Care Hospital)
- Refer to a weaning centre

RSSC APPROACH TO WEANING

- VENTILATE adequately.
- Get the DIAGNOSIS correct.
- NORMALISE – environment and function.
- NIV, BULBAR FUNCTION and EXPIRATORY MUSCLES.
- WEAN to the RIGHT LEVEL OF SUPPORT.
- DISCHARGE PLANNING and LONG-TERM CARE.

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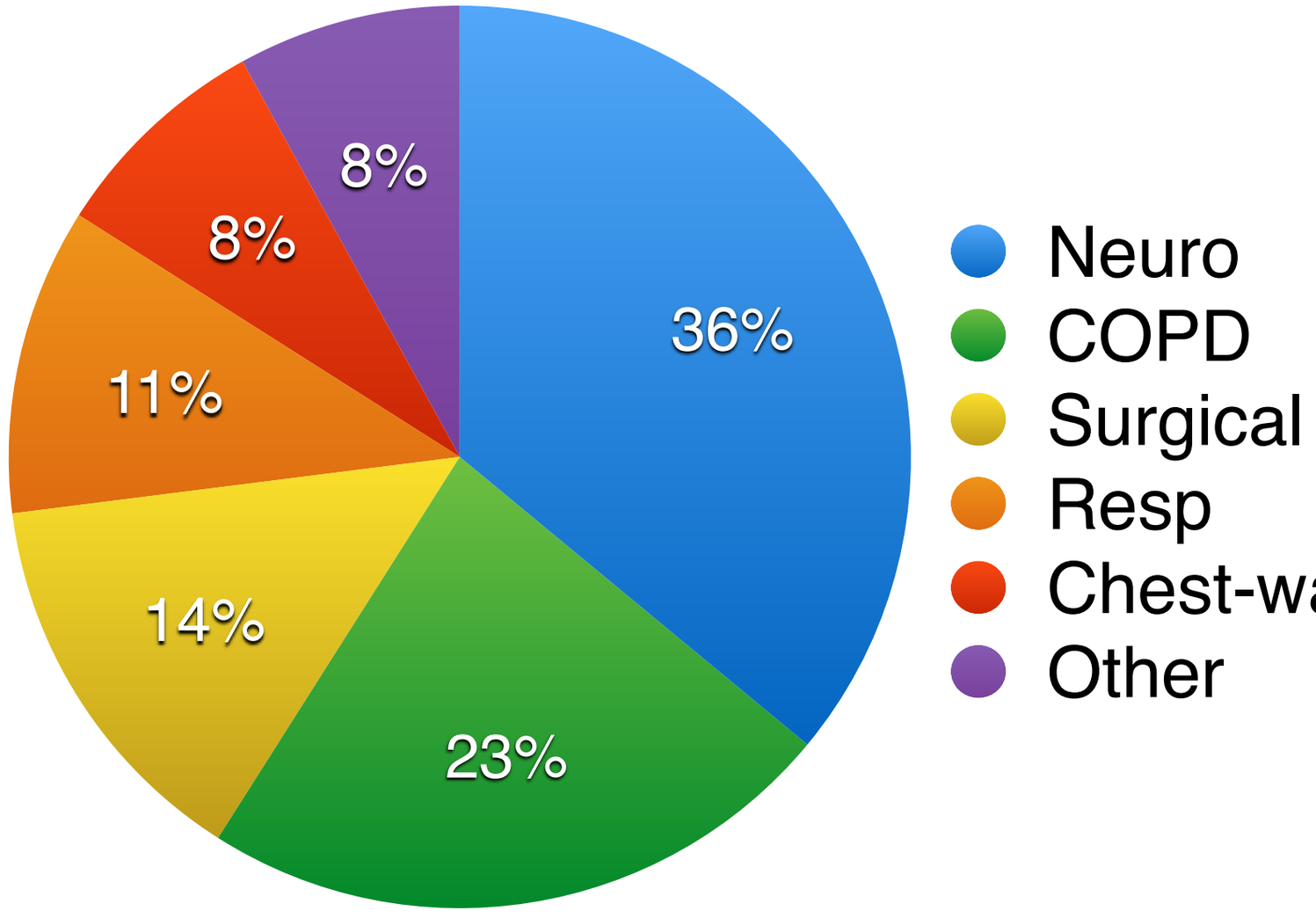
- VENTILATE adequately (PaCO2 8.7 kPa on transfer)
- Get the DIAGNOSIS correct.
  - **Sepsis (grumbling CRP) prolonged iv antibiotics**
  - **Respiratory Secretions, tracheostomy**
  - Fluid overload Diuresis
  - Cardiac
  - Psychological Anxiety / demotivation
- NORMALISE – environment and function.
- **NIV,** BULBAR FUNCTION and **EXPIRATORY MUSCLES (FOB via mini-tracheostomy during recovery).**
- **WEAN to the RIGHT LEVEL OF SUPPORT (NIV on discharge home)**
- **DISCHARGE PLANNING and LONG-TERM CARE (mini-trach for 6 months, husband main carer)**

RSSC WEANING UNIT - OUTCOMES

1992-2012 audited via database, retrospective note review, and ICU liaison

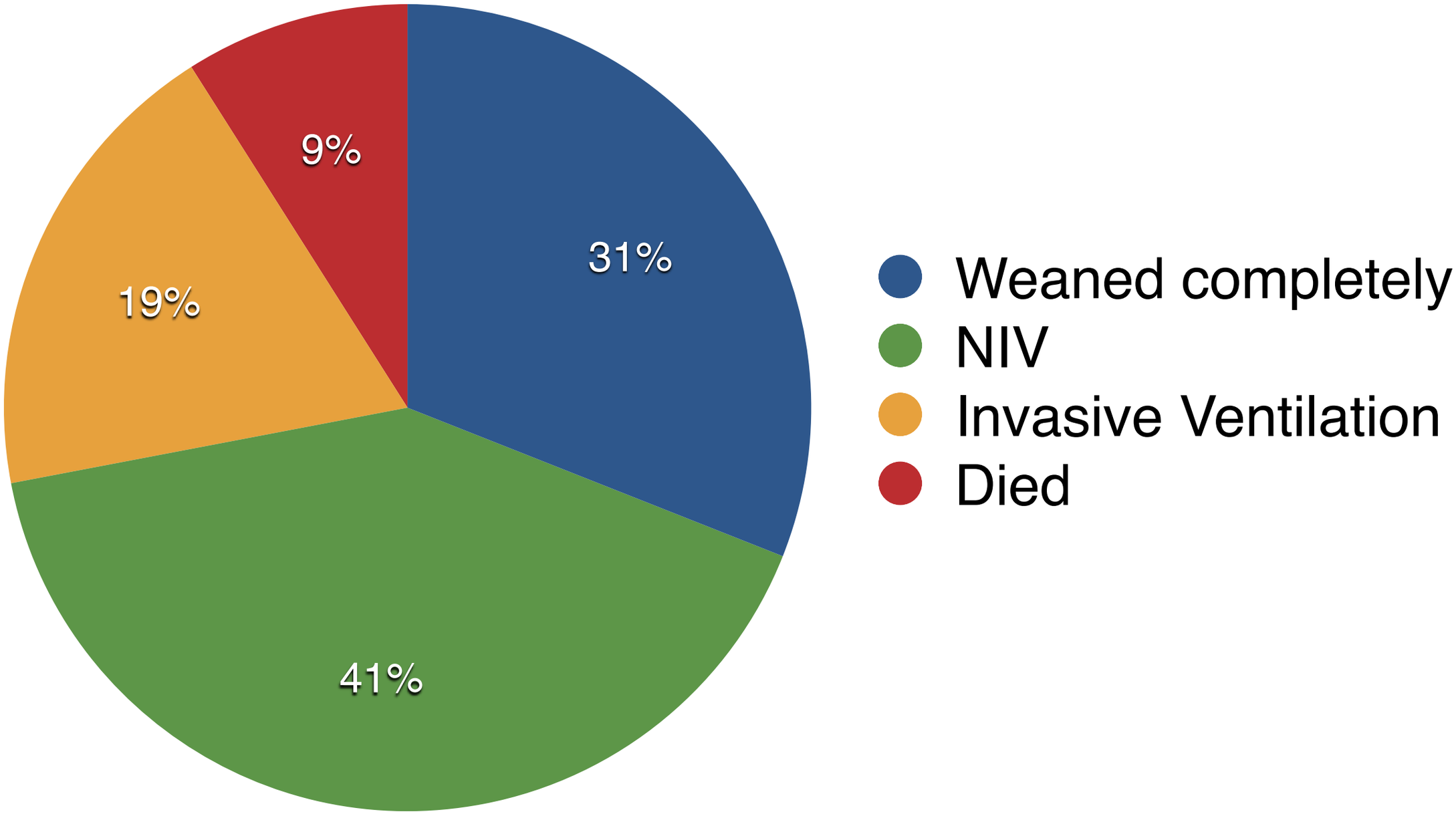
Variable - data 1992-2012	Total
Number admitted	458
Age, years (IQR)	61 (50-71)
Males, (%)	57%
ICU length of stay (days)	33 (18-55)
Referral source, n (%)	
External	421 (92%)
Internal	37 (8%)
$PaCO_2$ on admission, (kPa)	**10.0 (7.6-13.2)**
Ventilation requirements on admission, n (%)	
Full	**422 (92%)**
Nocturnal	**36 (8%)**

# WHAT IS THE PRIMARY CAUSE OF WEANING FAILURE?
N = 458



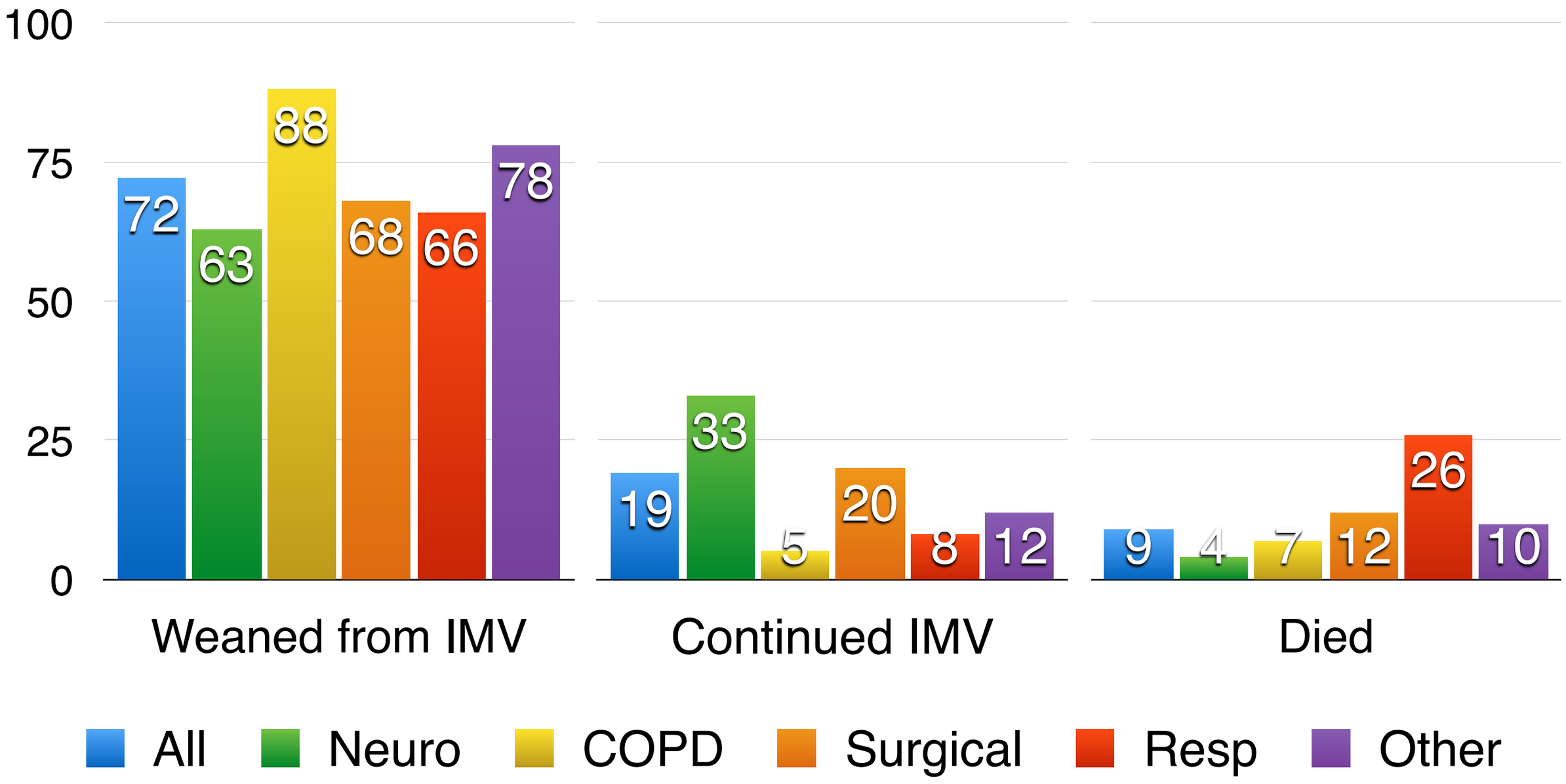
Usually, a pre-existing respiratory or neurological condition is present in patients who require prolonged invasive ventilation

OUTCOME OF ALL PATIENTS TRANSFERRED TO RSSC FOR WEANING (N = 458)

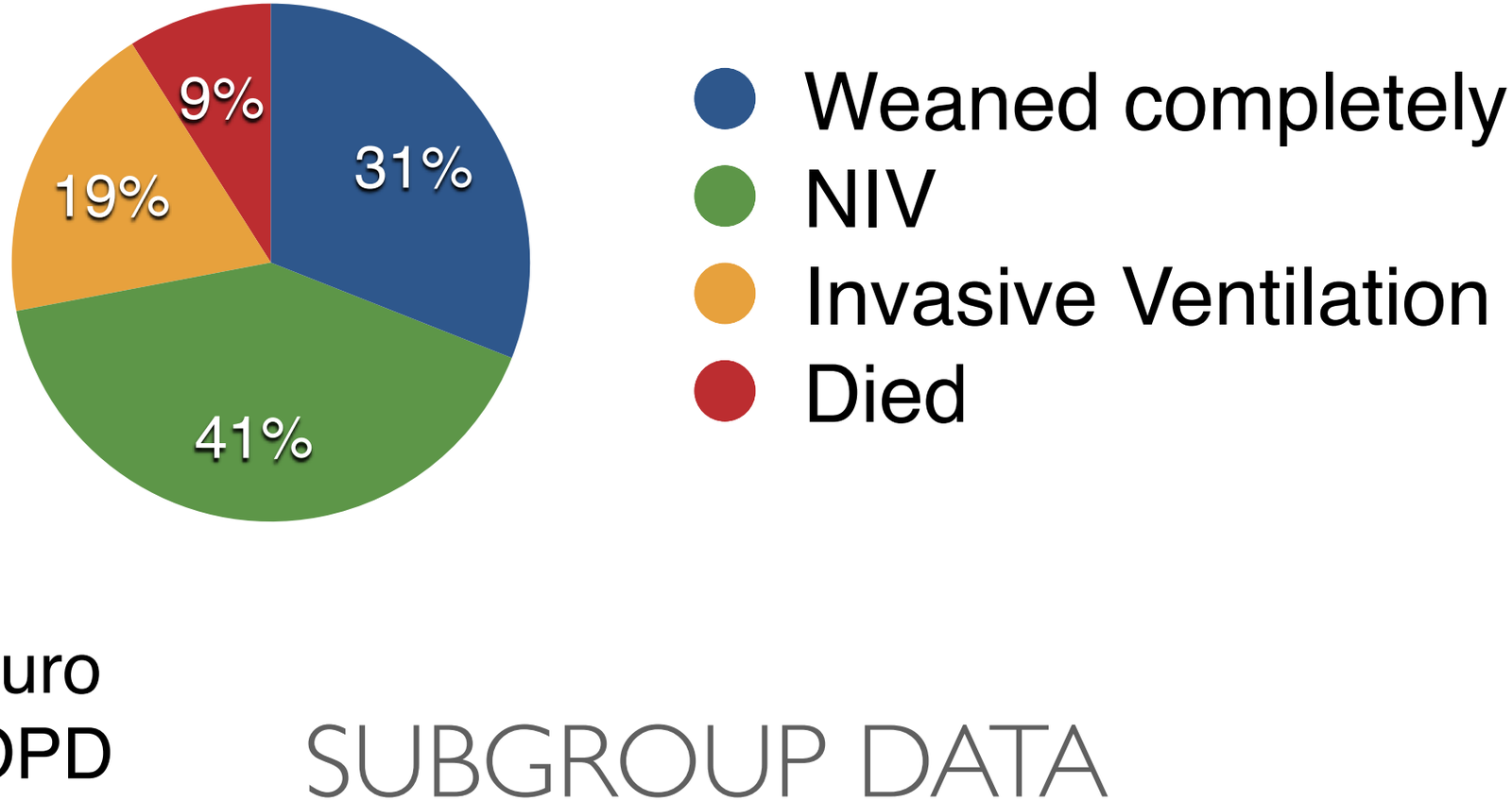


RSSC WEANING OUTCOMES

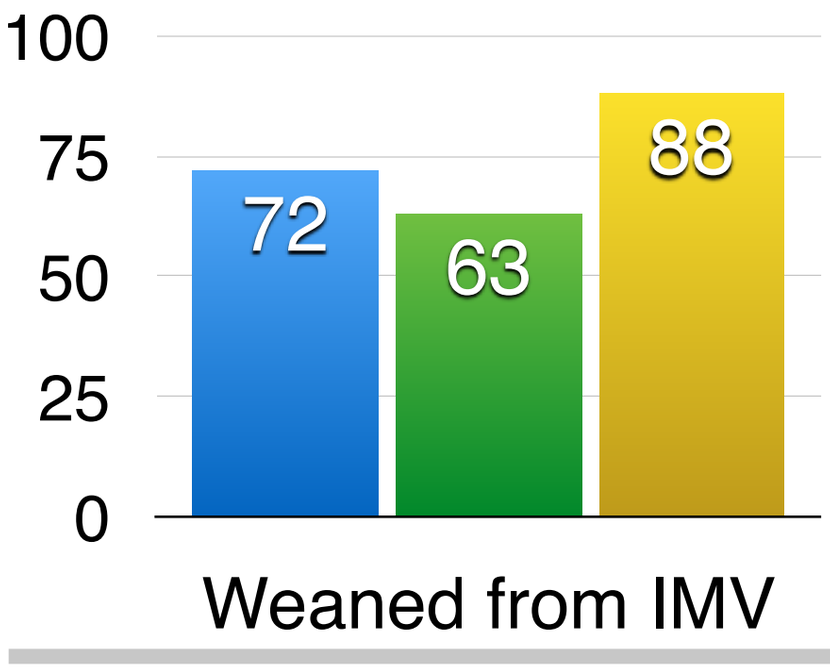
MODE OF VENTILATION ON UNIT DISCHARGE (%)



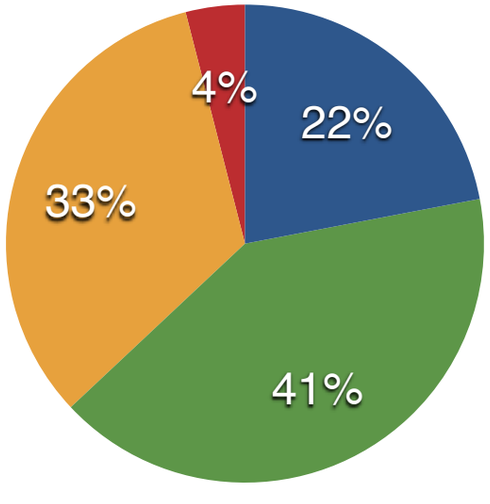
OUTCOME OF ALL PATIENTS TRANSFERRED TO RSSC FOR WEANING (N = 458)



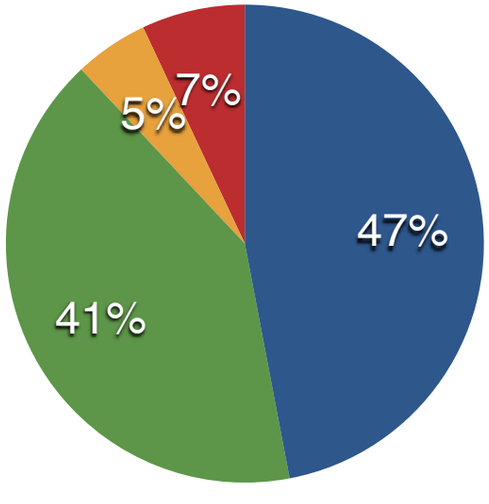
SUBGROUP DATA



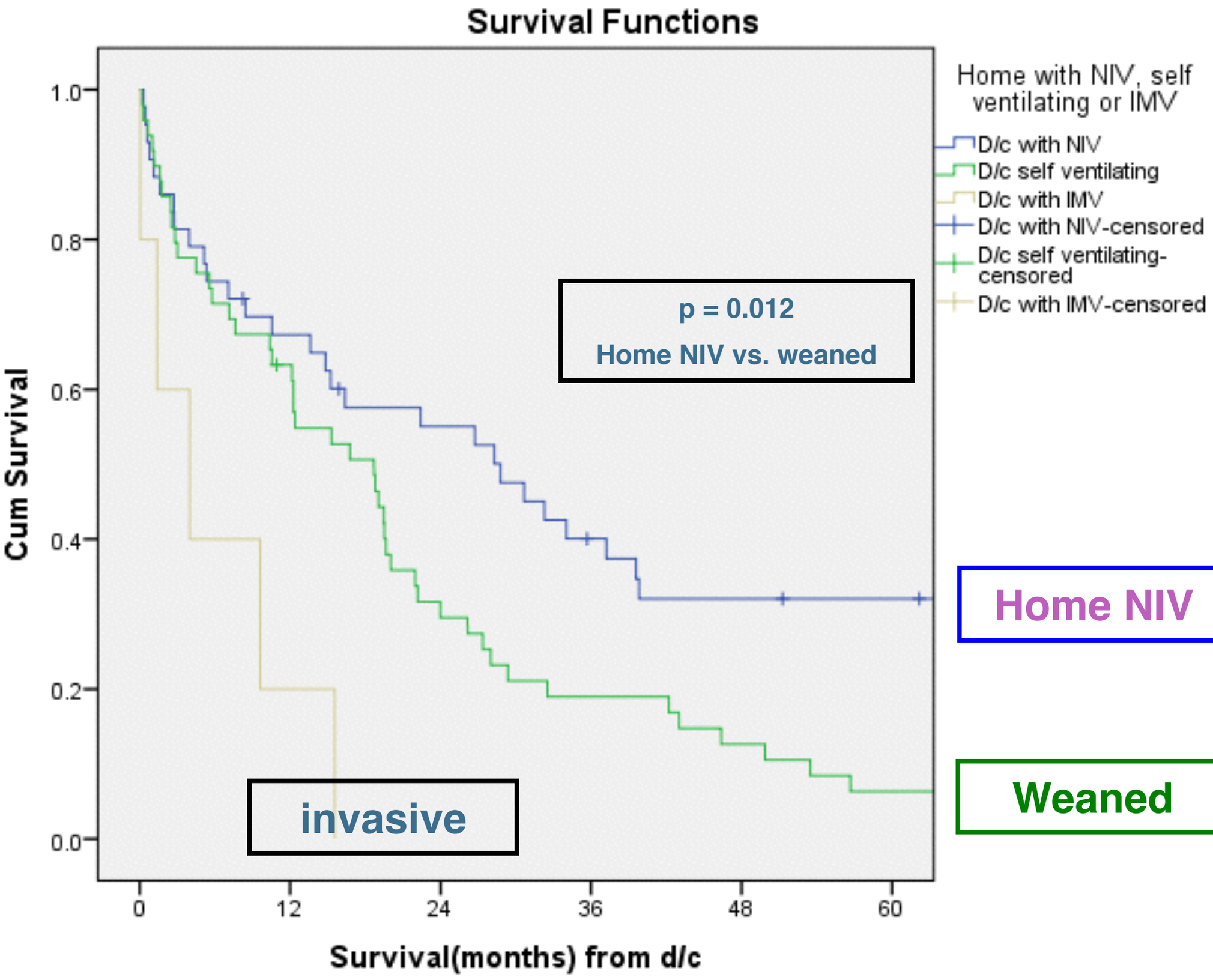
Neuro (165)



COPD (104)



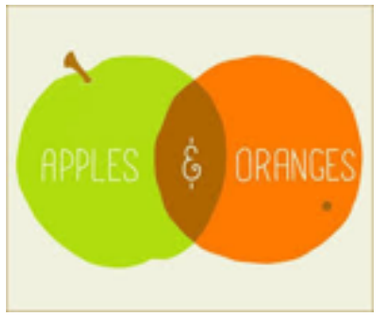
Survival in COPD patients - better in those discharged with NIV



HOW DOES THIS DATA COMPARE?

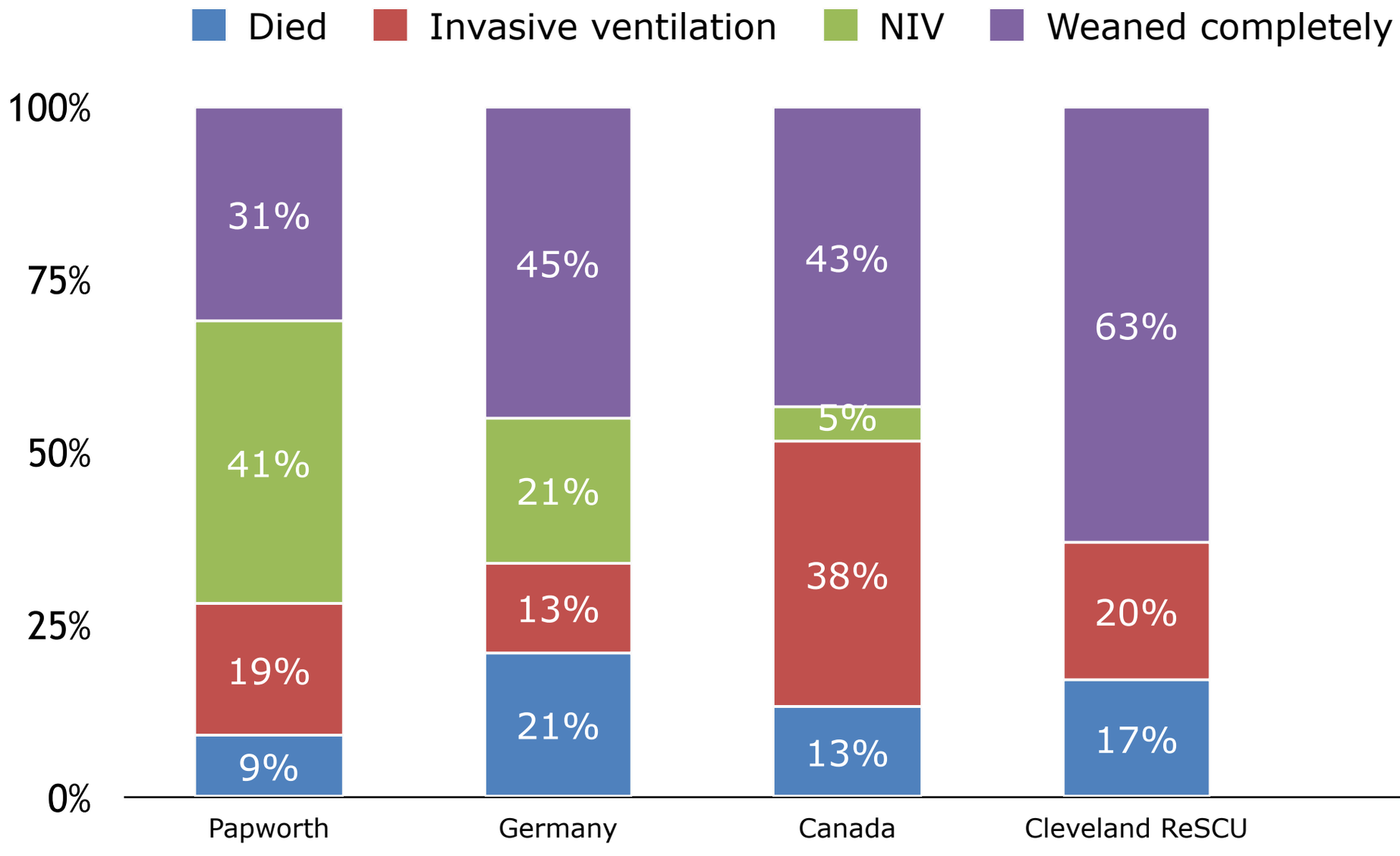
- **To continued ICU management?**
  - not fair on ICU - selection / referral bias
- **To the US model (step-down to Long-Term Acute Care Hospital)?**
  - selection bias? but fair to compare since it provides this service
- **To other specialised weaning centres?**

COMPARISON TO LONG-TERM ACUTE CARE HOSPITALS



Kahn et al *JAMA* 2006 303(22):2253-9

COMPARISON TO OTHER WEANING CENTRES
HOSPITAL OUTCOMES

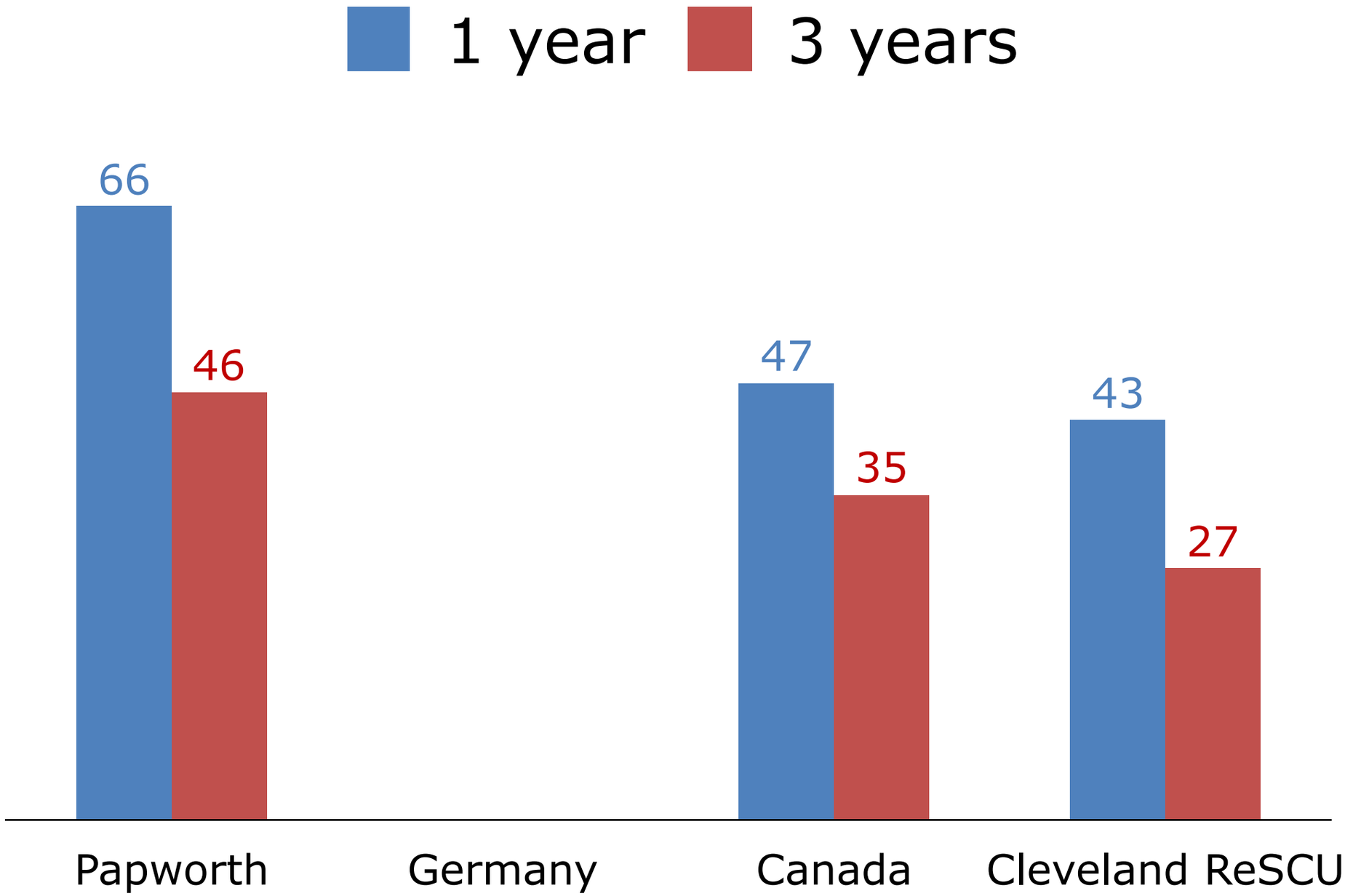


Schonhofer B et al Dtsch Med Wochenstr 2008

Rose L, Fraser I Can Respir J 2012

Stoller JK et al Chest 2003

COMPARISON TO OTHER WEANING CENTRES
LONG-TERM SURVIVAL



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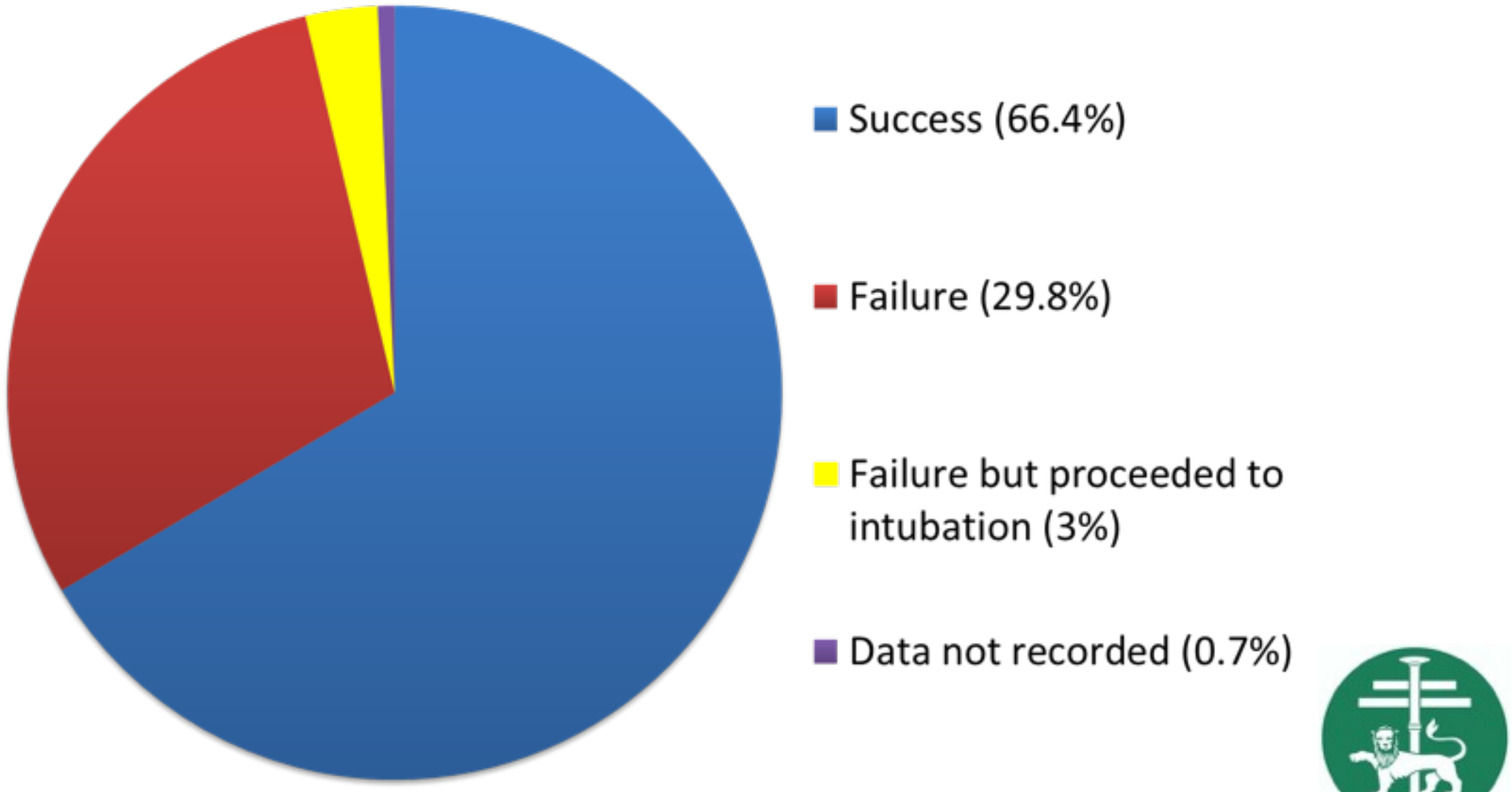
SUMMARY

- "Weaning failure" is "Persistent Ventilatory Failure."
- It is not "ICU failure." Typically, these patients have a pre-existing condition that affects ventilation.
- Specialised weaning unit outcomes are favourable. Highly skilled multi-disciplinary care is necessary, but weaning is usually successful.
- NIV is an important part of weaning and long-term care.
- In our series, COPD patients are not difficult to wean. Reasonable long-term survival at home is usually achieved.
- Better definitions of weaning failure might be "failure to refer" and "failure to accept transfer promptly."

NATIONAL ACUTE NIV AUDIT

HIGH FAILURE RATES FOR WARD-BASED CARE



NATIONAL ACUTE NIV AUDIT

POOR OUTCOMES IN PATIENTS WITH COPD