

**THE USEFULNESS OF
CURB-65 IN PREDICTING OUTCOMES OF
HOSPITALISED PATIENTS WITH
COMMUNITY ACQUIRED PNEUMONIA
IN
HOSPITAL UNIVERSITI SAINS MALAYSIA**

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INTRODUCTION

- **COMMUNITY ACQUIRED PNEUMONIA**
 - **Common disease: 15-50% - require admission .¹**
 - **Leading cause of death from infectious diseases.²**
- **The British Thoracic Society, Infectious Diseases Society of America, and the Canadian Thoracic Society guidelines recommend the use of validated prognostic tools as adjuncts to clinical judgment in managing CAP.^{3,4}**
- **Internationally, Pneumonia Severity Index (PSI) and CURB-65 score are recommended for use.^{5,6}**

1. Hoare, Lim (2006). Pneumonia; update diagnosis and management. *BMJ* 332, 1077-1079.

2. Ramirez JA (2003). Community-acquired pneumonia in adults. *Prim Care* 30, 155-171.

3. Fine MJ, Auble TE, Yealy DM, et al (1997). A prediction rule to identify low-risk patients with community-acquired pneumonia. *N Engl J Med* 336, 243-250.

4. Lim WS, van der Eerden MM, Laing R, et al (2003). Defining community-acquired pneumonia severity on presentation to hospital: an international derivation and validation study. *Thorax* 58, 377-382.

5. British Thoracic Society (2001). BTS guideline for management of community acquired pneumonia in adults. *Thorax* 56, Suppl. 4, 1-64.

6. Mandell LA, Wunderink RG, Anzueto A (2007). Management of community-acquired pneumonia in adults. *Clin Infect Dis.* 44, 27-40.

RATIONALE OF THE STUDY & BENEFIT

- **Although many studies reported that severity scoring system helps clinicians in managing patients with CAP, this scoring system is still not widely used in our population.**
- **Our aim for this study is to determine the usefulness of CURB-65 as a pneumonia severity score in predicting outcomes in hospitalised patients with CAP.**

OBJECTIVES

- **To describe the clinical profiles of hospitalised CAP patients in HUSM.**
- **To determine the proportion of adverse outcomes (use of inotropic support, ICU admission, need of ventilator support, in hospital mortality) in hospitalised CAP patients in HUSM.**
- **To determine the usefulness of CURB-65 as pneumonia severity score in predicting:**
 - **Use of inotropic support**
 - **ICU admission**
 - **Need for ventilation support**
 - **In-hospital mortality**

STUDY DEFINITIONS (1)

- **Community acquired pneumonia**
 - New pulmonary infiltrate (within 24 h of admission), associated with at least one of the factors: a new or increased cough, an abnormal temperature (<35.8 C or >37.8 C), or an abnormal leukocyte count (leukocytosis, leucopenia or absence of immature neutrophils).
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STUDY DEFINITIONS (2)

- **CURB-65 pneumonia severity scoring system (BTS guidelines 2009)**

CURB-65 Predictors	Point assigned
Confusion	1
Urea > 7mmol/l	1
Respiratory rate \geq 30/min	1
Systolic Blood pressure < 90 mmHg or Diastolic Blood pressure \leq 60 mmHg	1
Age \geq 65 years	1

- **Classification of CURB-65 score.**
 - **Lower CURB-65 score: any score \leq 2.**
 - **Higher CURB-65 score: any score \geq 3**

INCLUSION & EXCLUSION CRITERIA

INCLUSION

- Age: 12 years old and more
- Admitted with a diagnosis of CAP
- Approval by ethical committee

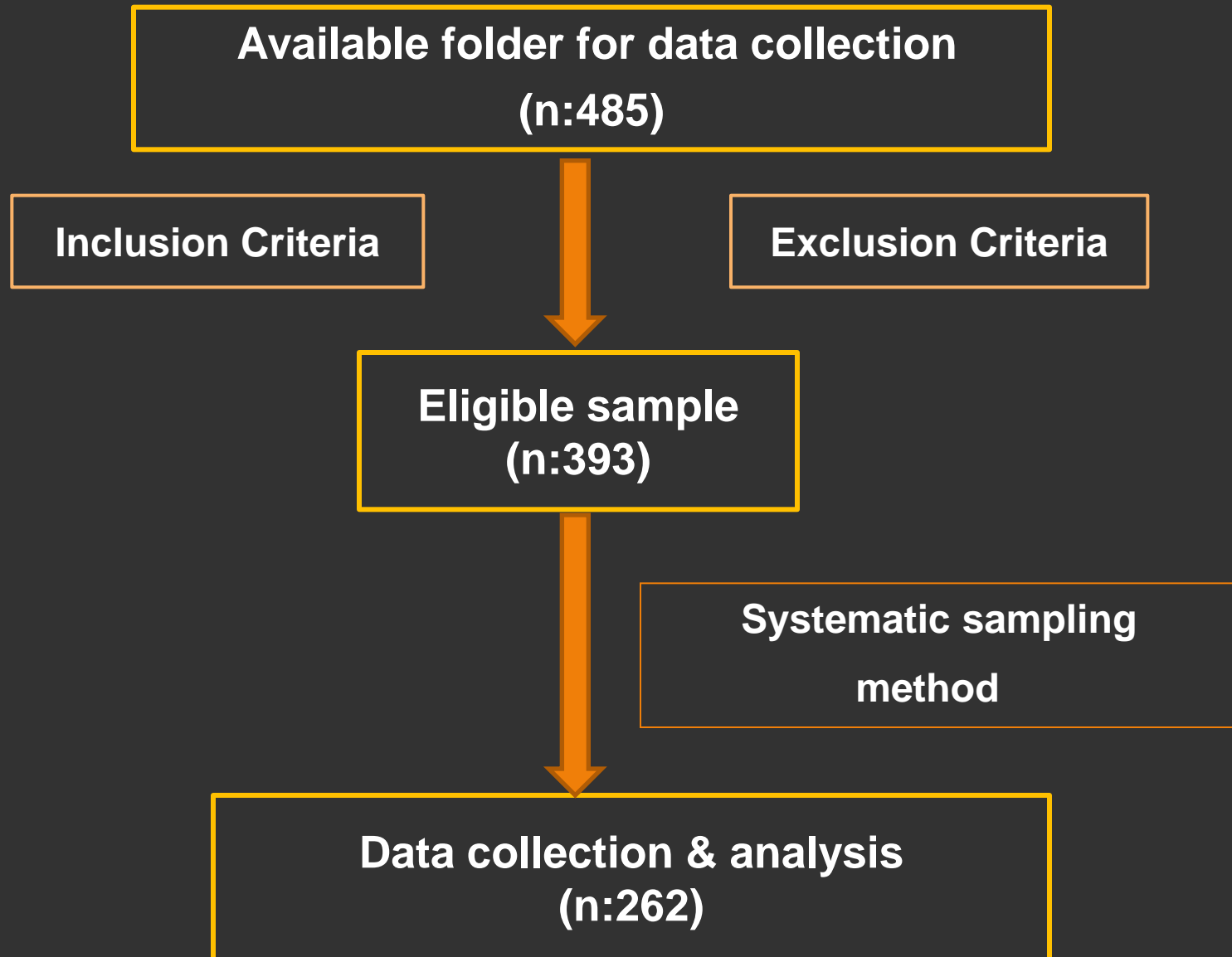
EXCLUSION

- Pulmonary tuberculosis
- Nosocomial pneumonia
- Ventilator-associated pneumonia
- Healthcare-associated pneumonia

STUDY DESIGN

A retrospective record review of patients with CAP, hospitalised in HUSM from June 2012 till June 2014 with the largest calculated sample size of 258 (for proportion of mortality, based on the study by Shaharudin A et al, 2011). The sample size was calculated to achieve power of 80 %, level of significance below 0.05, missing data 10%.

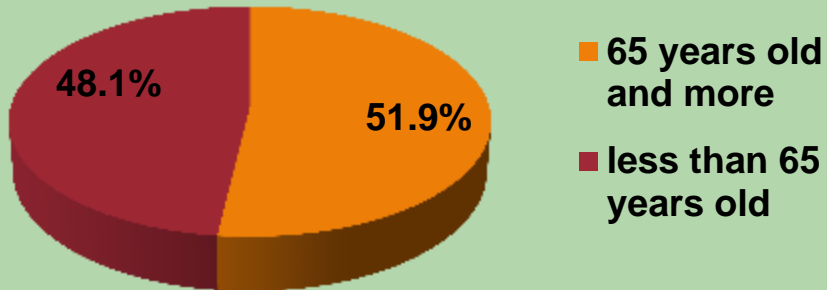
FLOW CHART



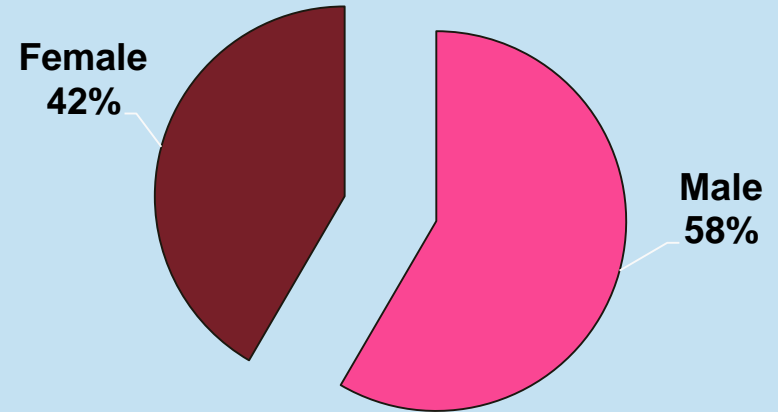
Results

Demography

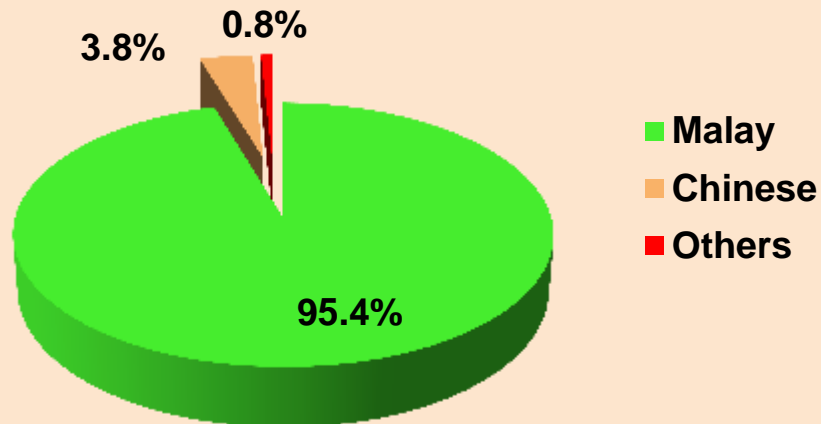
AGE



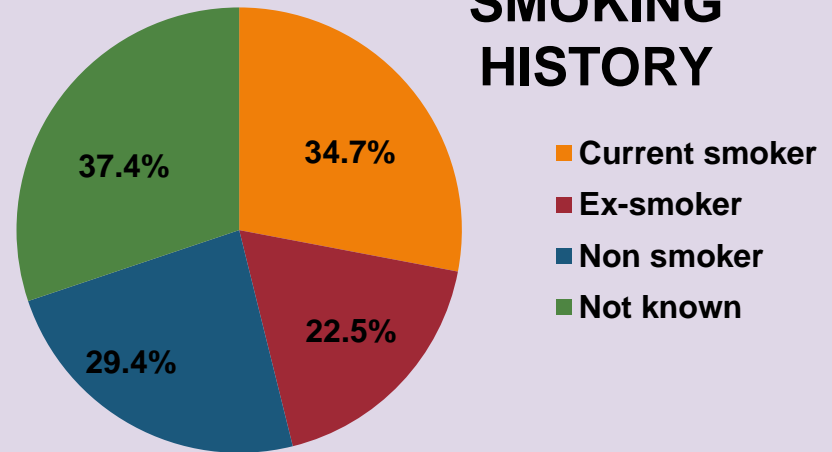
GENDER



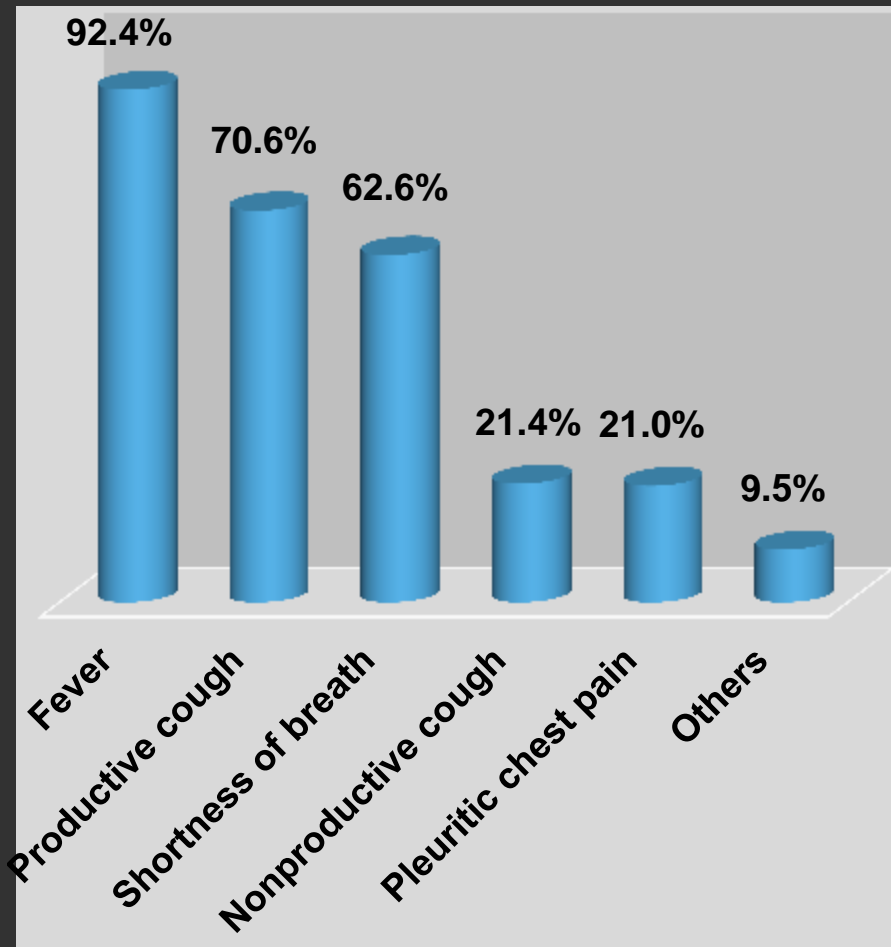
RACES



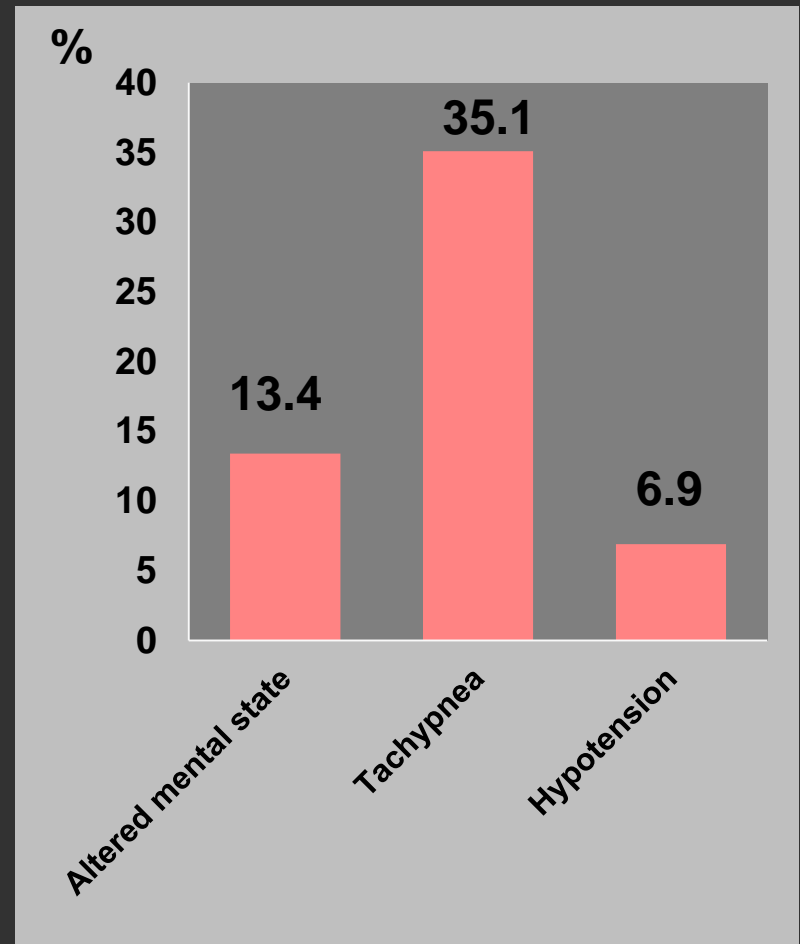
SMOKING HISTORY



Symptoms & Clinical Findings Upon Presentations

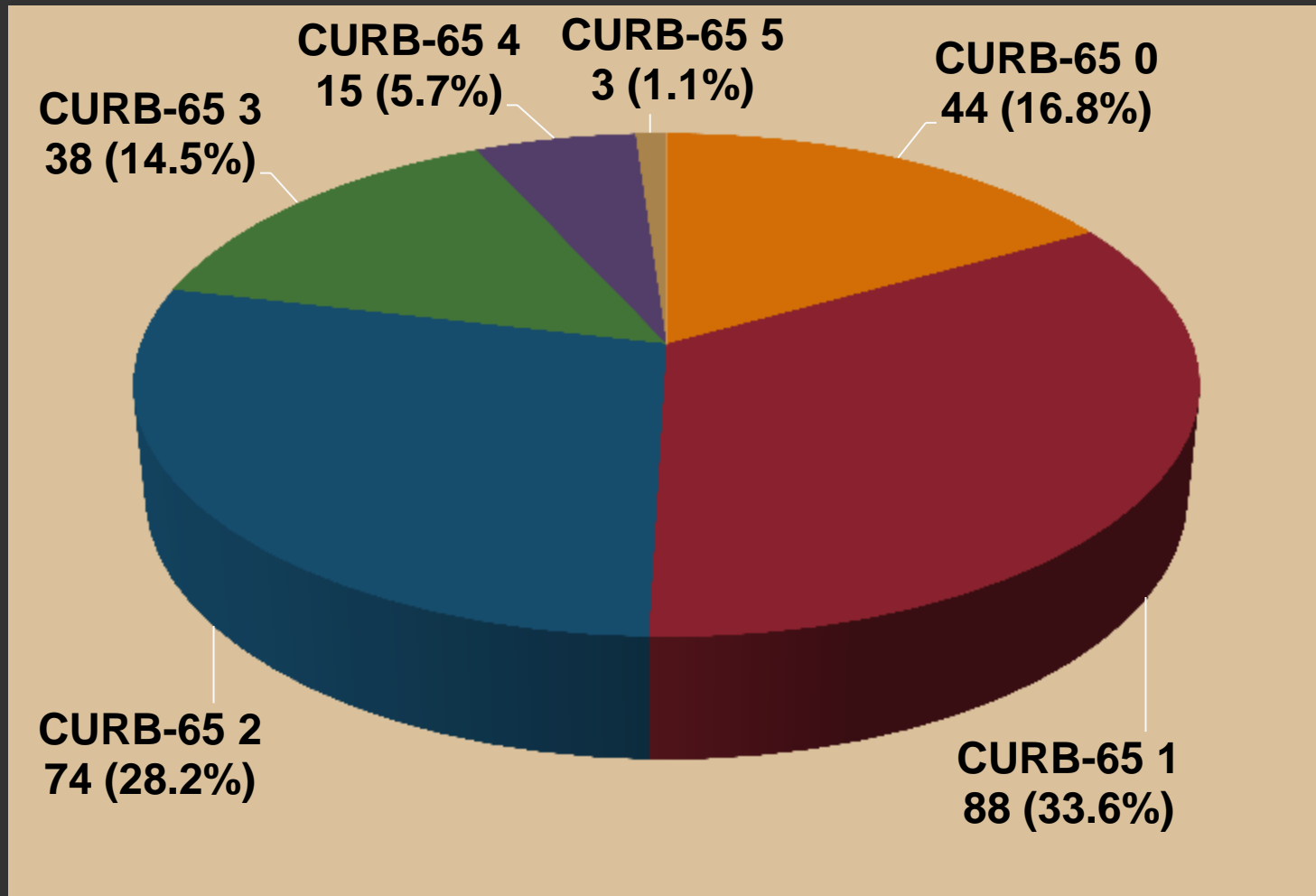


Symptoms



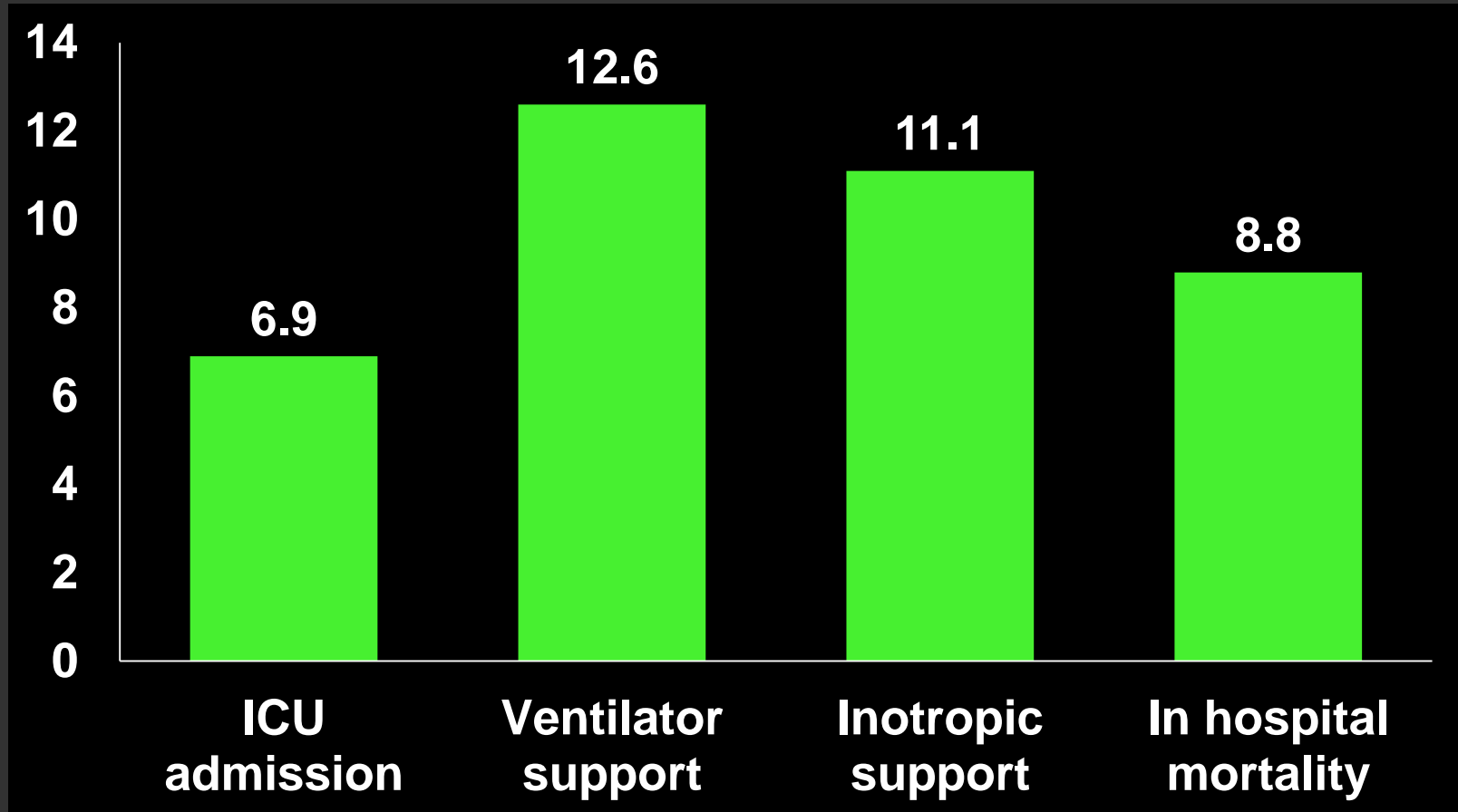
Clinical Findings

Percentage of patients according to CURB-65 score



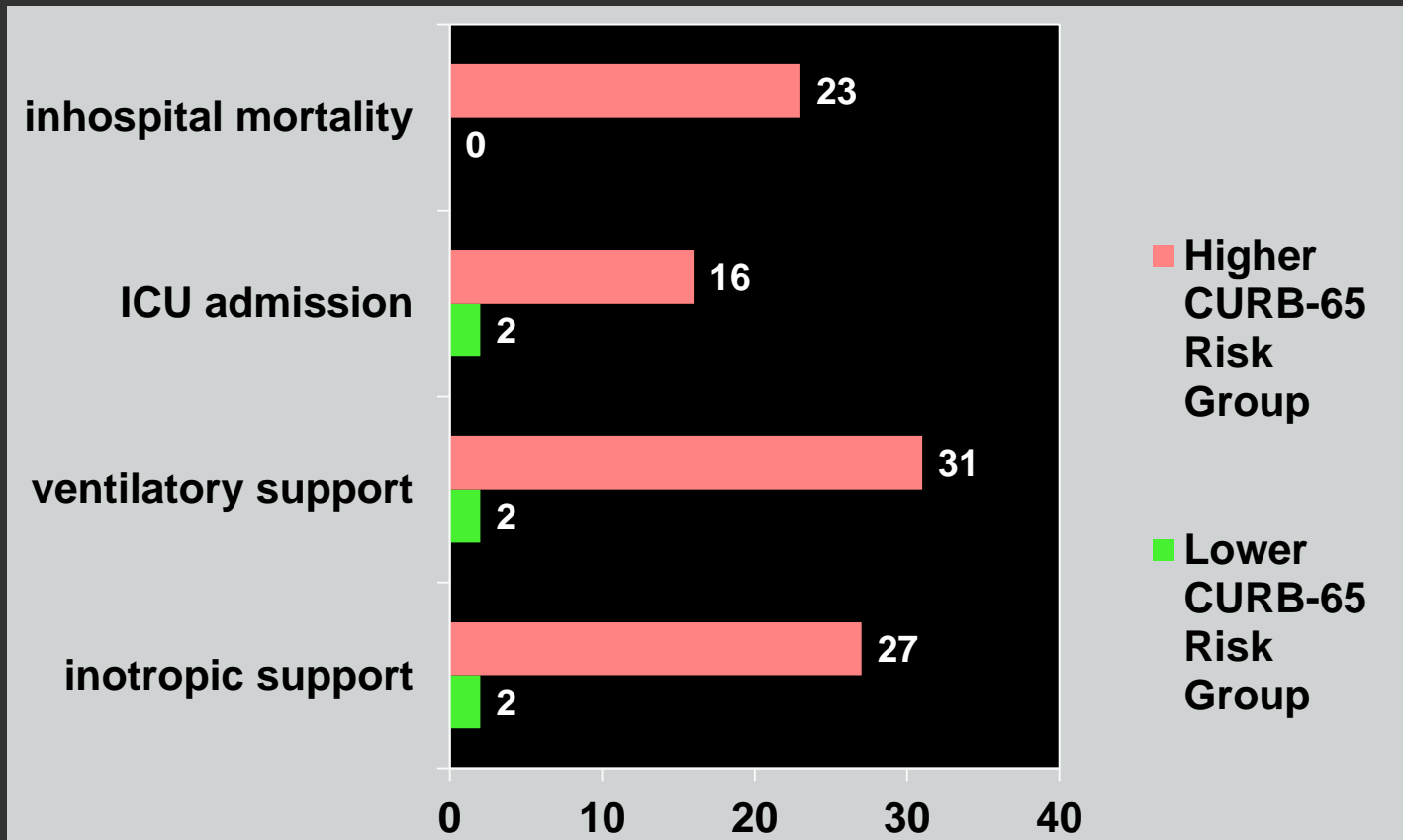
The proportion of adverse outcomes

%



Adverse outcomes

The Usefulness of CURB-65 score in Predicting Adverse Outcome



Comparison between higher and lower CURB-65 risk group for each adverse outcome

The Usefulness of CURB-65 score in Predicting Adverse Outcome

Simple Logistic Regression and Chi-square Test:

Outcomes	B	Crude OR ^b	95% CI of Crude OR	X ²	p-value
Ventilatory Support	1.81	6.13	3.53, 10.67	118.30 ^a	<0.001
Inotropic Support	1.75	5.73	3.30, 9.97	99.84 ^a	
ICU Admission	1.12	3.05	1.92, 4.86	52.42 ^b	
In Hospital Mortality	1.79	5.96	3.25, 10.91	92.40 ^b (90.7) ^c	

^a Pearson Chi-square test applied as no cell have expected count less than 5 (0%)

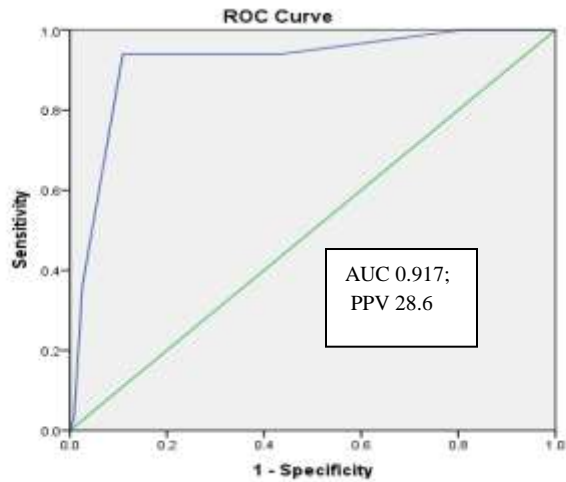
^b Fisher exact test applied as 1 cell has expected count less than 5 (25%)

^c Yate's correction test applied 1 cell has observed count 0, > critical value = 3.841 ($\alpha=0.05$, $df=1$)

The Usefulness of CURB-65 score in Predicting Adverse Outcome

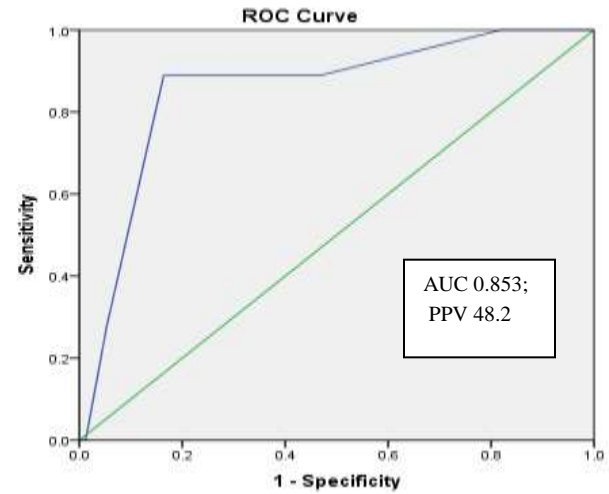
Predictive Test:

Adverse Outcome	Sensitivity (CI)	Specificity (CI)	PPV (CI)	NPV (CI)	AUC (CI)
ICU admission	93.9 (79.8, 99.3)	87.5 (84.3, 92.3)	48.2 (41.5, 68.7)	99.0 (96.5, 99.9)	0.853 (0.764, 0.943)
Used of inotropic support	93.1 (77.2, 99.2)	85.5 (82.6, 91.5)	55.4 (34.6, 61.9)	99.0 (96.5, 99.9)	0.927 (0.892, 0.963)
Need of ventilation support	88.9 (65.3, 98.6)	83.6 (78.4, 88.0)	28.6 (17.3, 42.2)	99.0 (96.5, 99.9)	0.917 (0.864, 0.971)
In hospital mortality	100.0 (85.2, 100.0)	86.2 (81.2, 90.3)	41.1 (28.1, 55.0)	100.0 (98.2, 100.0)	0.938 (0.909, 0.967)



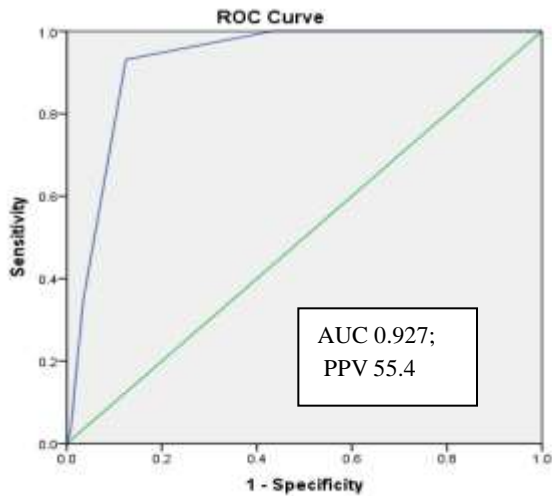
Diagonal segments are produced by ties.

VENTILATORY SUPPORT



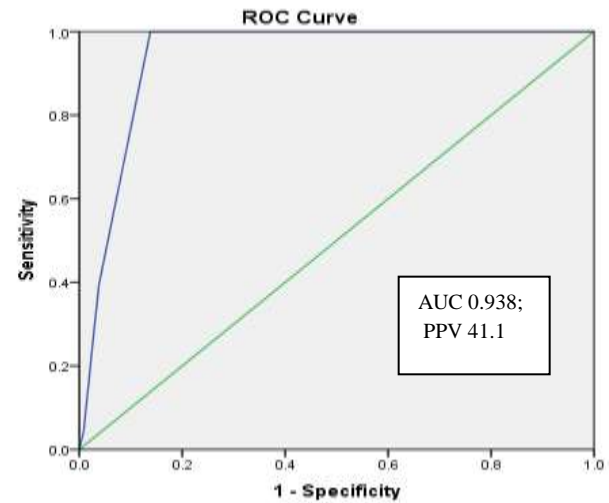
Diagonal segments are produced by ties.

ICU ADMISSION



Diagonal segments are produced by ties.

INOTROPIC SUPPORT



Diagonal segments are produced by ties.

INHOSPITAL MORTALITY

CONCLUSIONS

- The highest proportion of adverse outcome in this study is need of ventilation support (12.6%), followed by need of inotropic support (11.1%), in hospital mortality (8.8%) and need of ICU admission (6.9%)
- The CURB-65 severity score showed significant association with the adverse outcomes; need of inotropic support, need of ventilation support, ICU admission and in hospital mortality, with high sensitivity (89-100 %) and specificity (84-88 %) .

STUDY LIMITATIONS AND RECOMMENDATIONS

LIMITATIONS

- Retrospective medical records review study on majority Malay population.
- The result not be applied to other races – not represent overall community.
- CXR interpreted by managing doctors only.

RECOMMENDATIONS

- Multicentre, involving more different races.
- CXR interpretation should be done blinded by panel of doctors / radiologists.
- To do comparison with other scoring systems.

Thank You