

# Antibiotics Use And Concordance To Guidelines For Patients Hospitalized With Community Acquired Pneumonia (CAP)

**SF Teoh<sup>1</sup>, Samsinah Hussain<sup>1</sup>, CK Liam<sup>2</sup>**

<sup>1</sup>Departments of Pharmacy, Faculty of Medicine, University of Malaya, and <sup>2</sup>General Medicine, University Malaya Medical Centre (UMMC), Kuala Lumpur, Malaysia.

# Outline

- **Introduction**
- **Objectives**
- **Methodology**
- **Results and discussion**
- **Conclusion**

# Introduction

- Pneumonia: sixth mortality cause in Malaysia from 1991 to 2000<sup>1,2</sup>.
- Guideline-recommended antibiotic - more cost saving without causing variation in patients' clinical outcome<sup>3,4,5</sup>.

# Objectives

1. To describe the treatment pattern of antibiotics use according to
  - *American Thoracic Society (ATS) 2001 guidelines<sup>3</sup>*
  - *Infectious Disease of America (IDSA) 2003 guidelines<sup>6</sup>*
  - *University Malaya Medical Centre (UMMC) 2004 antibiotics guidelines<sup>7</sup>*for patients hospitalized with CAP in UMMC
2. To determine levels of guidelines concordance

# Methodology

All patients hospitalized with CAP (between January 2004 until November 2006) according to ICD 10<sup>th</sup> coding (J13, J14, J15, and J16)

Total patients (n= 202)

Number of patients excluded (n=123)

Episodes fulfilling inclusion criteria were included (n= 79)

Guidelines adherence were determined according to ATS, IDSA, UMMC recommendations

Data analysis using SPSS (Statistical Package for Social Science version 15.0)

# Exclusion criteria

- **Less than 18 years old, pregnant or lactating**
- **Hospital admission within past 30 days**
- **Aspiration or hospital-acquired pneumonia**
- **Residence in nursing home**
- **Pneumonia as expected outcome of severe chronic comorbidity**
- **Tuberculosis**
- **Others**
  - discharge at patient's request
  - participation in clinical trial
  - HIV positive
  - concurrent chemotherapy
  - immuno-suppression,
  - cystic fibrosis
  - incomplete medical records

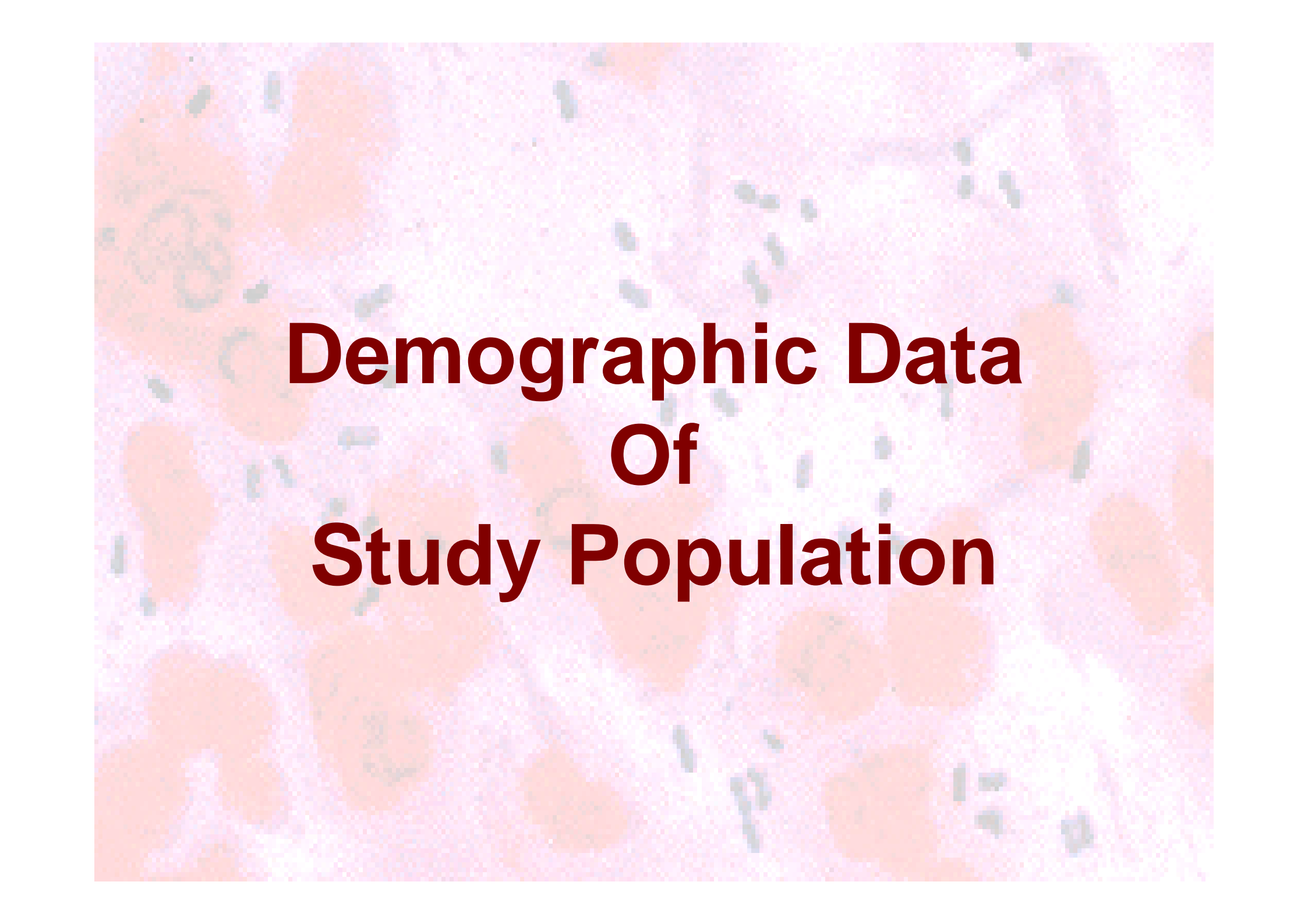
# **Comparison Of Treatment Recommendations**

	ATS 2001 Guidelines <sup>3</sup>	IDSA 2003 Guidelines <sup>6</sup>	UMMC 2004 Antibiotic Guidelines <sup>7</sup>
Empirical antibiotic for medical warded patients	<ul style="list-style-type: none"> <li>▪ cardiopulmonary disease : fluoroquinolones <u>OR</u> beta-lactam + macrolides</li> <li>▪ no cardiopulmonary disease: azithromycin <u>OR</u> fluoroquinolones</li> </ul>	<ul style="list-style-type: none"> <li>▪ fluoroquinolone <u>OR</u> advanced macrolide (azithromycin/clarithromycin) + beta-lactam</li> </ul>	<ul style="list-style-type: none"> <li>▪ <i>no co-morbid illness</i>: doxycycline <u>OR</u> azithromycin</li> <li>▪ <i>with co-morbid illness</i>: azithromycin + amoxicillin/clavulanic acid <u>OR</u> azithromycin + cefuroxime</li> <li>▪ <i>severe</i>: ceftriaxone + azithromycin <u>OR</u> gatifloxacin</li> </ul>
Antibiotic initiation	▪ Within 8 hours	▪ Within 4 hours	▪ Not mentioned





# **Results and Discussion**

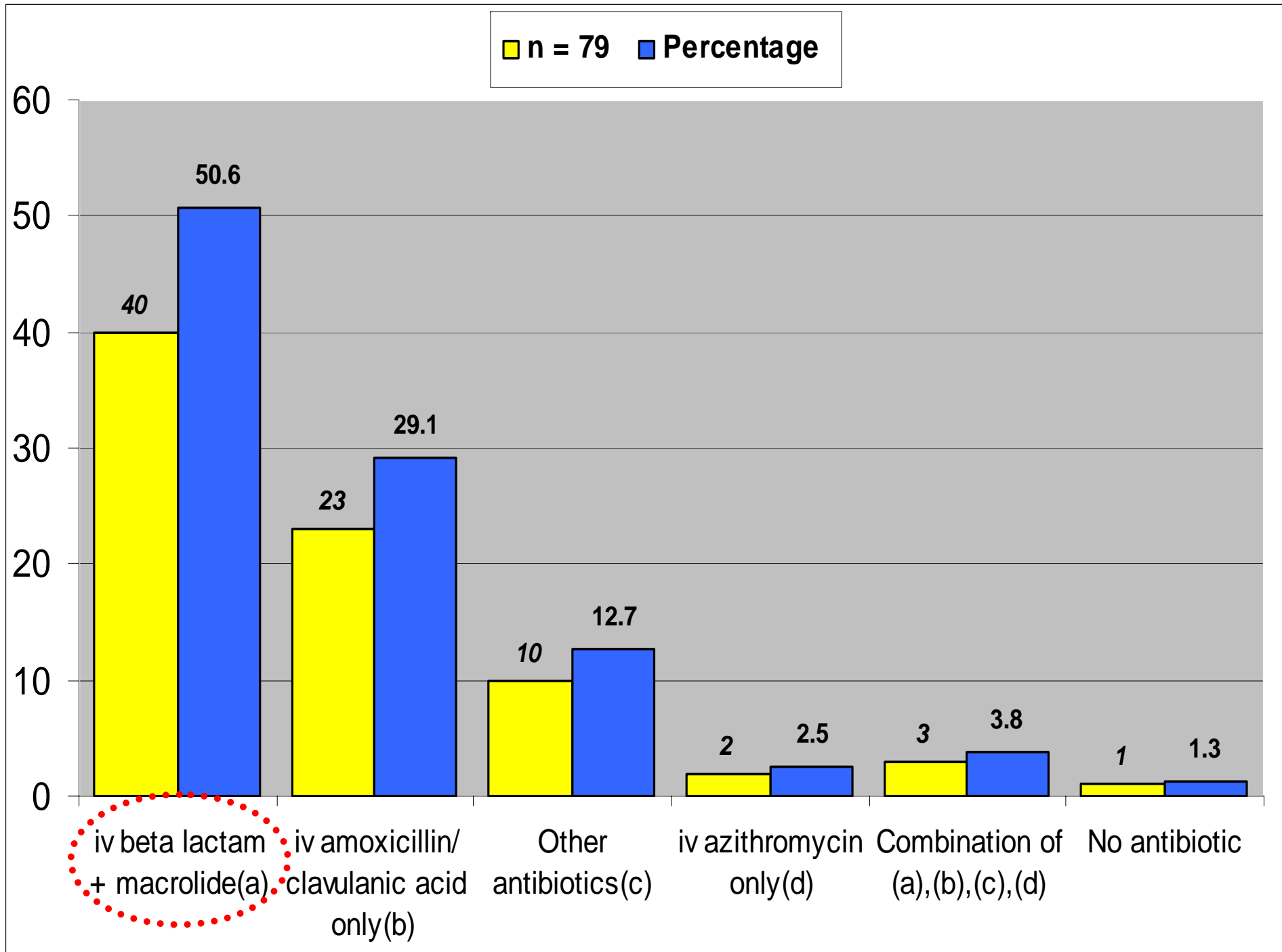


# **Demographic Data Of Study Population**

Demographic	n=79	Percentage (%)
Male	41	48.1
Malay	27	34.2
Indian	25	31.6
Chinese	22	27.8
Others	5	6.8
Non-smoker	43	54.4
Had stopped	24	30.4
Still smoking	12	15.2
At least 1 comorbidity	67	84.8
No comorbidity	12	15.2



# **Types Of Empirical Antibiotics Therapy**





**Types Of Empirical  
Antibiotics Therapy  
According  
To Guidelines  
Recommendations**

Guidelines	ATS		IDSA		UMMC	
	Yes	No	Yes	No	Yes	No
IV beta lactam and IV/PO macrolide (a)	12 ✓	28	40 ✓	0	31 ✓	9
IV azithromycin only (b)	2 ✓	0	0	2	0	2
IV amoxicillin/ clavulanic acid only (c)	0	23	0	23	0	23
Other antibiotics (d)	0	10	0	10	0	10
Combination of above	0	3	0	3	0	3
No antibiotics	0	1	0	1	0	1
n (percentage)	14 (17.7)	65 (82.3)	40 (50.6)	39 (49.4)	31 (39.2)	48 (60.8)

# Reasons Of Low Concordance

- More specific guidelines – lower adherence
- If criteria for use is not clearly specified – higher tendency to fall into adherence



# Timing Of Antibiotics Initiation

Time to antibiotic initiation	Frequency	Percentage
Within 8 hours	37	46.8
More than 8 hours	42	53.2

- Early antibiotic delivery<sup>8,9,10</sup>:
  - Stepping down antibiotics
  - Early switch of parenteral to oral antibiotics

**Comparison Of Length Of  
Stay, Average Daily Antibiotic  
Cost And Total Treatment  
Cost Between Guidelines**

Guidelines	Non-Concordant	Concordant	<i>p</i> -value
<b>ATS Guidelines</b>			
LOS	36.28	57.29	0.002*
Average daily antibiotic cost	37.02	53.86	0.013*
Total treatment cost	36.63	55.64	0.005*
<b>IDSA Guidelines</b>			
LOS	34.32	45.54	0.029*
Average daily antibiotic cost	35.22	44.66	0.067
Total treatment cost	33.92	45.93	0.020*
<b>UMMC Guidelines</b>			
LOS	34.23	48.94	0.005*
Average daily antibiotic cost	35.86	46.40	0.046*
Total treatment cost	33.69	49.77	0.002*

## Possible Reasons For Variation From Reported Findings

- Differed from previous studies, earlier antibiotics initiated patients incurred higher average daily antibacterial costs (mean rank RM47.32 vs. RM32.55,  $p$ -value=0.008).

- Guidelines concordance incurring higher costs
  - Majority of the non-adhered patients were prescribed single beta-lactam
  - Limitation
    - ✓ None employment of severity levels measurement.
    - ✓ Assessment - by clinical judgement and vital sign monitoring
    - ✓ Outcome measure – merely consideration of discharge status

# Conclusion

- Concordance to available guidelines can be further improved although higher antibiotics costs were found in patients treated in concordance to the guidelines.

# References

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An anatomical illustration of the human respiratory system, showing the trachea, bronchi, and lungs. The illustration is set against a dark red background. Three circular insets on the right side provide microscopic views of the airways: the top inset shows a cross-section of a bronchiole with cilia and goblet cells; the middle inset shows a cross-section of a bronchiole with a thick, green, fibrous wall; the bottom inset shows a cross-section of a bronchiole with a thick, green, fibrous wall and a cluster of pinkish-purple cells. The text "THANK YOU and ACKNOWLEDGEMENT" is overlaid in white, bold, sans-serif font across the center of the illustration.

**THANK YOU and  
ACKNOWLEDGEMENT**