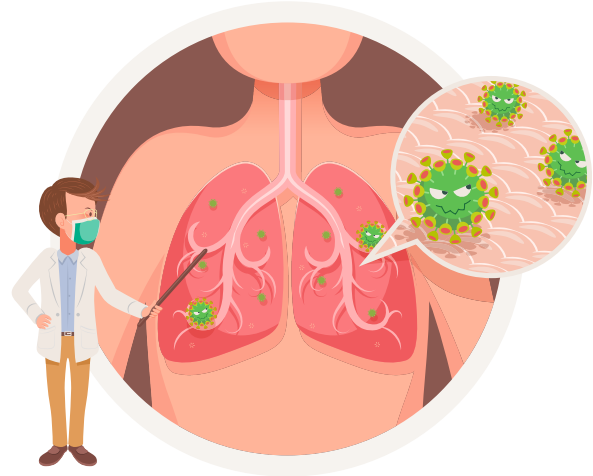# INCIDENCE AND RELATED FACTORS OF HOSPITAL ACQUIRED PNEUMONIA AMONG PATIENTS ADMITTED IN A TERTIARY GOVERNMENT HOSPITAL

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BACKGROUND OF THE STUDY

- **Hospital-acquired pneumonia** - lung *infection* at least 48 hours after admission

- **Ventilator associated pneumonia** - patient has undergone intubation and received mechanical ventilation for at least 48 hours.

- The incidence of hospital acquired pneumonia in the pediatric areas is increasing.

- Philippines: 16.1 to 89 episodes per 1,000 ventilator days
- PPS: 4,904 cases (out of 4, 987, 336)

- 50 CASES COME FROM THE NORTHERN CENTRAL MINDANAO.

Local data to describe its burden is limited.

OBJECTIVE AND METHODOLOGY

GENERAL OBJECTIVE

Determine the risk factors affecting the incidence of hospital acquired pneumonia among patients admitted in the neonatal and pediatric intensive care units in a tertiary government hospital from January 2021 to March 2022

STUDY DESIGN

Retrospective descriptive case–control method

SAMPLE POPULATION

- **All patients aged 3 days to 17 years old upon admission** who stayed for more than 6 days at the PICU and NICU.
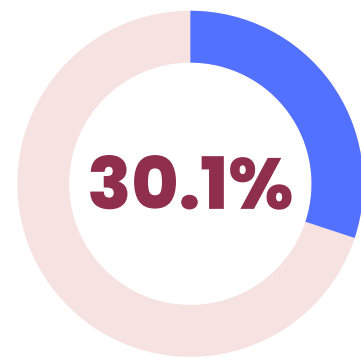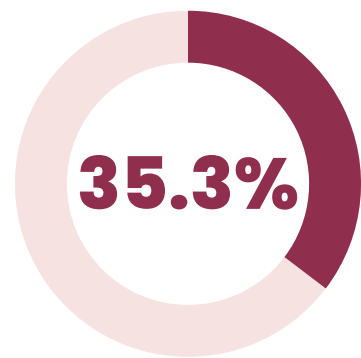- Referral patients were excluded

SAMPLE SIZE

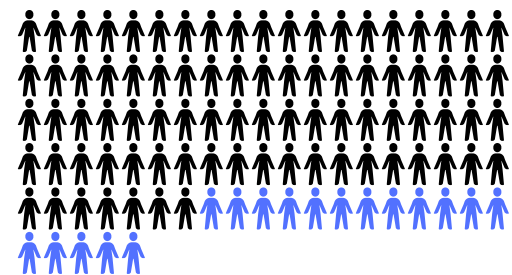**266 patients**

RESULTS

Sociodemographic Profile of Patients
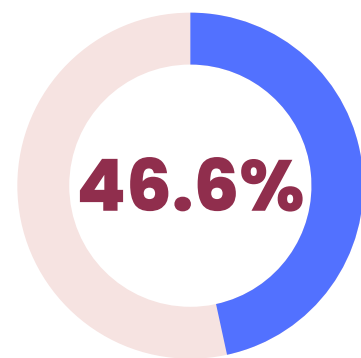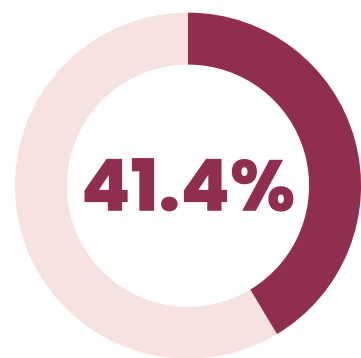
HOSPITAL ACQUIRED
PNEUMONIA (n=133)

NON- HOSPITAL ACQUIRED
PNEUMONIA (n=133)

35.3%

30.1%

The majority were 1 month to <1 year old
(cases n=47, 35.34%; controls n=40, 30.07%)

Majority are males
(cases n= 79, 59.4%; controls n=83, 62.4%)

41.4%

46.6%

Most live below the poverty line
(cases n=55, 41.4%; controls n=62, 46.6%)

RESULTS

Table 2. Risk Factors Identified

RISK FACTORS	HOSPITAL ACQUIRED PNEUMONIA (n=133)		NON-HOSPITAL ACQUIRED PNEUMONIA (n=133)		OR (95% CI)	p-value
	FREQUEN-CY (n)	PERCEN-TAGE	FREQUEN-CY (n)	PERCEN-TAGE		
COMORBIDITY						
▪ None	81	60.9	75	56.3	Ref.	
▪ Lung disease	2	1.5	5	3.8	2.54 (.48 – 13.54)	.261
▪ Neurologic disorder	9	6.8	5	3.8	.56 (.18 – 1.77)	.321
▪ Cardiovascular disease	11	8.2	8	6.0	.74 (.28 – 1.95)	.539
▪ Renal disease	1	0.8	2	1.5	2.03 (.18 – 22.92)	.559
▪ Malignancy	8	6.0	14	10.5	1.78 (.7 – 4.51)	.223
▪ Neutropenia in the Absence of Malignancy	2	1.5	0	0	Cannot be computed	.163
▪ Malnutrition	4	3.0	5	3.8	1.27 (.33 – 4.93)	.731
▪ At least 2 of the Comorbidities	15	11.3	19	14.3	1.29 (.6 – 2.74)	.515

RESULTS

Table 2. Risk Factors Identified

RISK FACTORS	HOSPITAL ACQUIRED PNEUMONIA (n=133)		NON-HOSPITAL ACQUIRED PNEUMONIA (n=133)	
	FREQUENCY (n)	PERCENTAGE	FREQUENCY (n)	PERCENTAGE
RESPIRATORY SUPPORT				
▪ **Use of Mechanical Ventilator**	103	77.4	88	66.2
HOSPITAL STAY PRIOR TO DEVELOPING PNEUMONIA			N/A	
▪ **> 7 days**	106	79.7		
MEDICATIONS GIVEN PRIOR TO DEVELOPING HAP **1. INITIAL ANTIBIOTIC USED**				
▪ **Cephalosporin**	70	52.6	66	49.6
1. IMMUNOSUPPRESSIVE AGENTS				
▪ **None**	114	85.7	117	88.0

RESULTS

Table 2. Risk Factors Identified

RISK FACTORS	HOSPITAL ACQUIRED PNEUMONIA (n=133)		NON-HOSPITAL ACQUIRED PNEUMONIA (n=133)	
	FREQUENCY (n)	PERCENTAGE	FREQUENCY (n)	PERCENTAGE
NURSE-TO-BED RATIO				
▪ **1:2 – 1:4**	80	60.2	100	75.2
NUMBER OF TIMES OF REINTUBATION				
▪ **None**			79	59.4
▪ **1 – 2x**	58	43.6		
NUMBER OF TIMES MV TUBINGS ARE CHANGED				
▪ **Never**	82	61.7	81	60.9

RESULTS

Table 3. Association of hospital acquired pneumonia with the following controllable factors

CHARACTERISTICS	HAP (n=133)	NO HAP (n=133)	OR (95% CI)	p-value
NURSE TO BED RATIO n(%)				
▪ 1:2 – 1:4	80 (60.2)	101 (75.9)	Ref.	
▪ 1:5 – 1:7	34 (25.6)	22 (16.5)	.51 (.28-.94)	0.31
▪ 1: >=8	19 (14.3)	10 (7.5)	.42 (.18-.95)	0.33
INSTRUMENTATION n(%)				
▪ None	51 (38.3)	79 (59.4)	Ref.	
▪ 1 – 2x	58 (43.6)	42 (31.6)	.47 (.28-.80)	.995
▪ 3 – 4x	21 (15.8)	12 (9.0)	.37 (.17-.81)	0.12
▪ >= 5x	3 (2.3)	0	.40 (.32-.50)	0.34
MV TUBINGS CHANGE n(%)				
▪ Not applicable	24 (18.0)	42 (31.6)	Ref.	
▪ Once	19 (14.3)	10 (7.5)	.30 (.12-.75)	0.009
▪ Twice	8 (6.0)	0	.36 (.26-.50)	**0.001**
▪ Never	82 (61.7)	81 (60.9)	.56 (.31-1.02)	0.55

RESULTS

Table 4. Outcome of Patients

CHARACTERISTICS	HAP (n=133)	NO HAP (n=133)	OR (95% CI)	p-value
TOTAL (DISCHARGED)	91 (68.4)	96 (72.2)	Ref.	
▪ **With Comorbidities**	45 (33.8)	39 (29.3)	.82 (.49 – 1.38)	**.455**
▪ **Without Comorbidities**	46 (34.6)	51 (38.3)	1.05 (.64 – 1.72)	**.843**
TOTAL (EXPIRED)	42 (31.6)	43 (32.3)	Ref.	
▪ **With Comorbidities**	28 (21.1)	28 (21.1)	.98 (.5 – 1.92)	**.946**
▪ **Without Comorbidities**	14 (10.5)	15 (11.3)	1.05 (.45 – 2.43)	**.916**

CONCLUSIONS

- High incidence of hospital acquired pneumonia
- Infants, male, low socioeconomic status
- Presence of underlying disease increases the risk
- Used mechanical ventilation
- Prolonged hospital stay
- High patient-to-nurse ratio and repeated intubations show no contributory effect
- High mortality rate

RECOMMENDATIONS

- Bigger scale research
- Consistent surveillance and policy planning
- Proper practice of healthcare policies
- Digital database for all patients with HCAIs