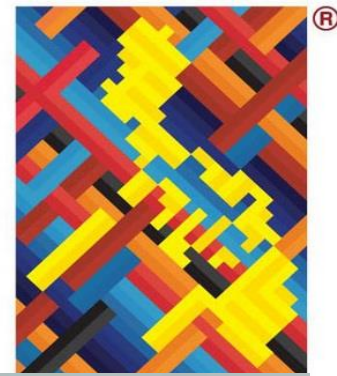




Data on burden of pneumonia  
in the country is limited

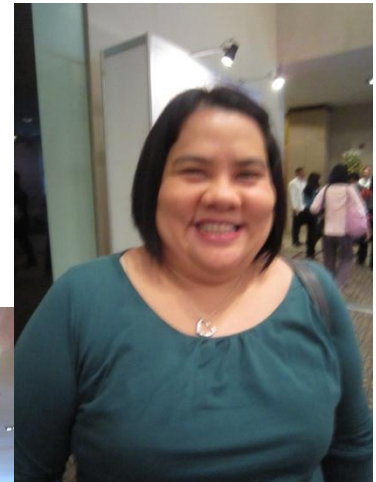
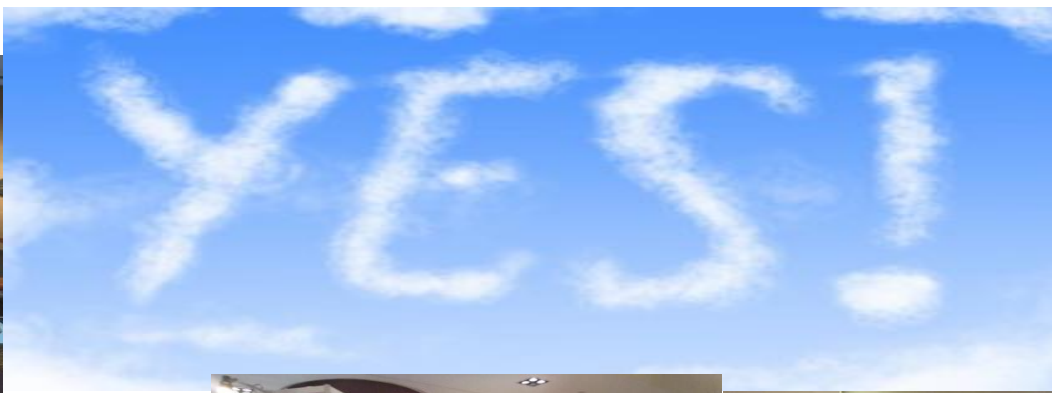
It's more fun in the  
**Philippines**



A 3D-rendered spotlight is positioned at the top center of the frame, casting a bright yellow cone of light downwards. The light cone widens as it descends, creating a large, glowing yellow oval on the dark grey background. The text 'Top Killer of Children: Pneumonia' is centered within this oval. The words 'Top Killer of Children:' are in white, and 'Pneumonia' is in bold black.

# Top Killer of Children: **Pneumonia**

Maria Rosario Z. Capeding, M.D.  
Research Institute for Tropical Medicine

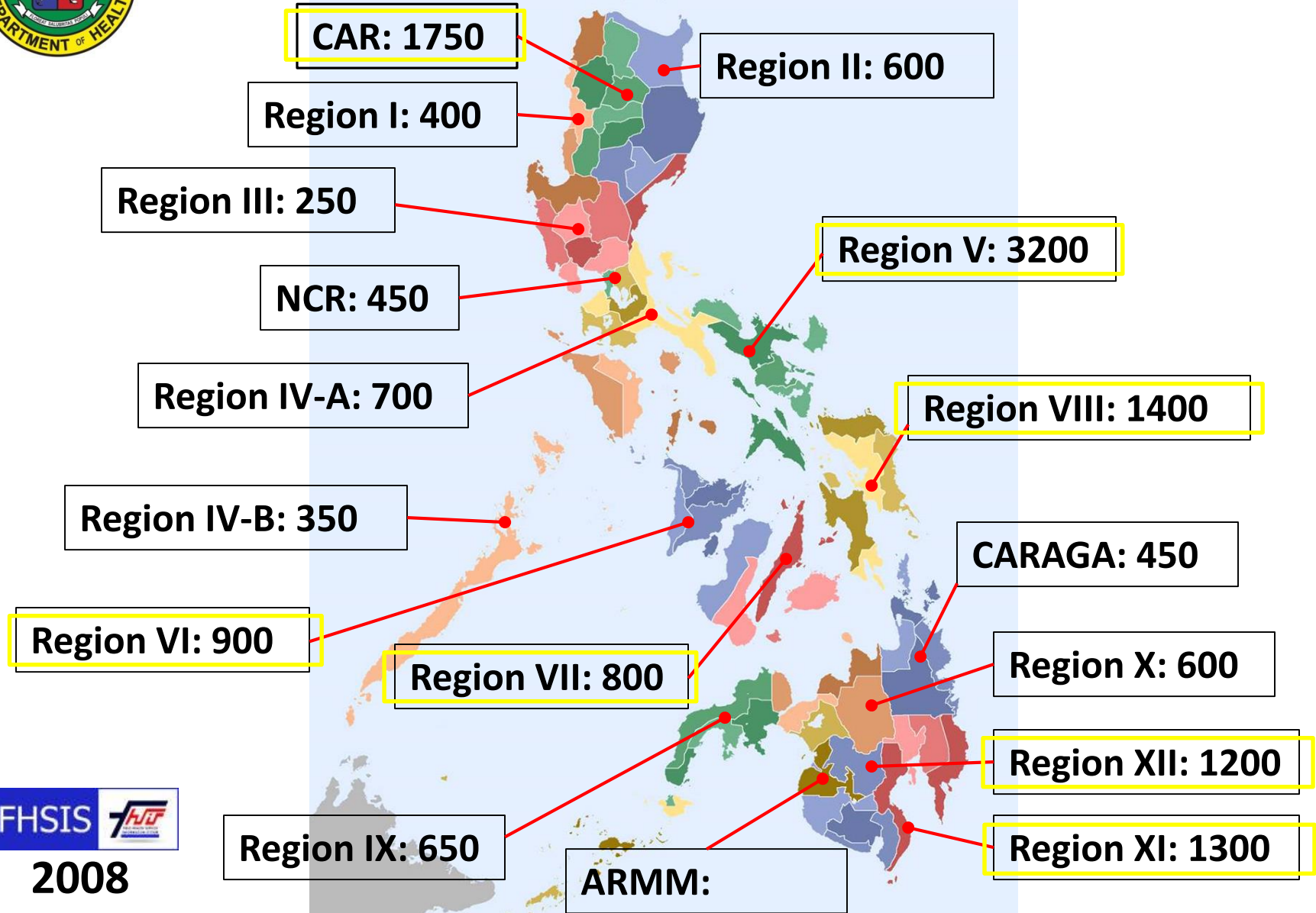


**Pneumonia remains to be a major cause of morbidity and mortality among Filipino children.**



# Pneumonia Morbidity Rate by Region

Rate per 100,00 population





# Acute Lower Respiratory Infection/ Pneumonia Cases

Year	No . Of Cases	Rate/100,000 population
2009	557,780	612.6
2008	780,199	871.8
2007	605,471	718.0
2006	670,231	828.8
2005	690,566	828.0

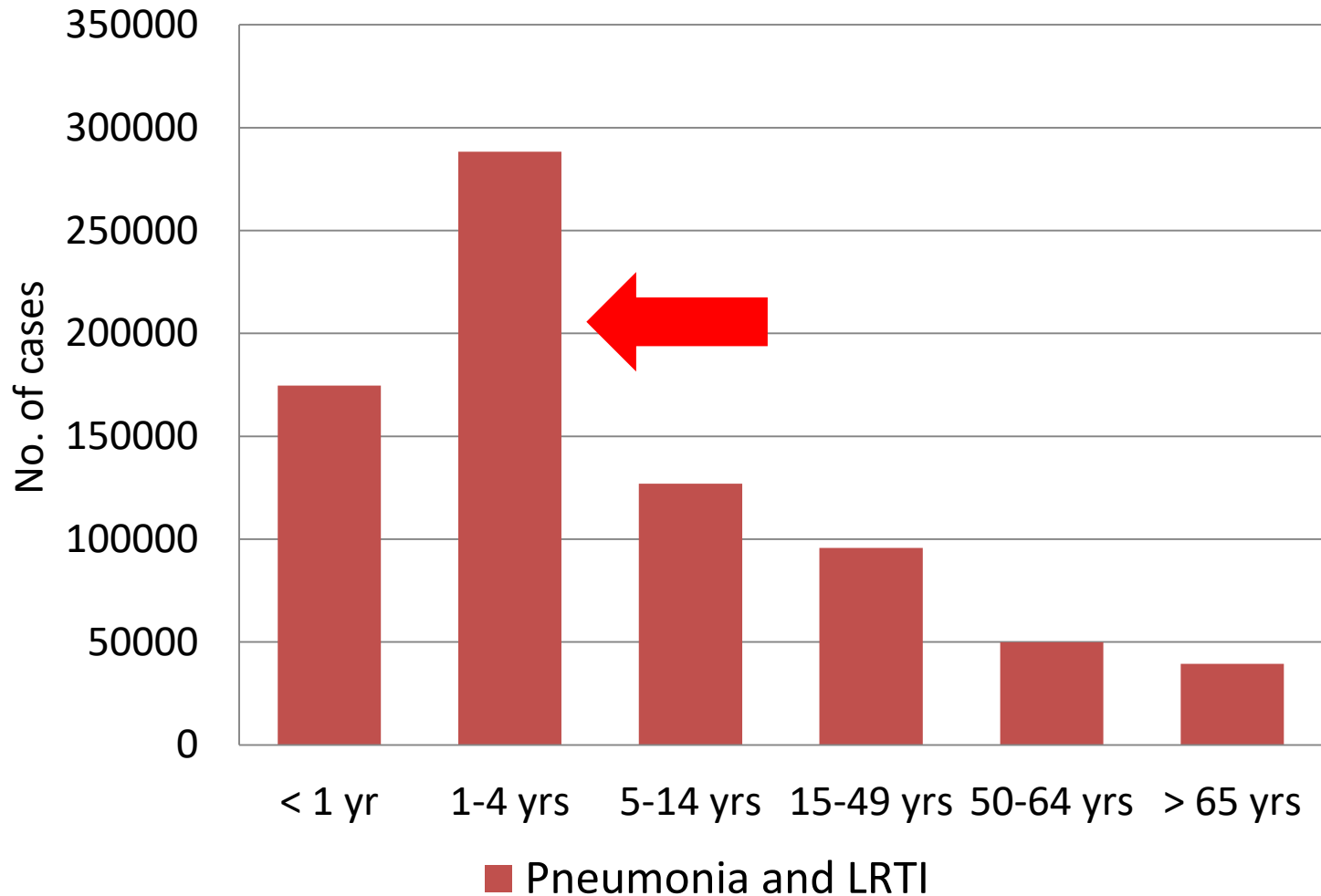
# Active Hospital-based Surveillance Study of IPD and Pneumonia Among Urban Children (2007-2009)



	<b>PGH</b>	<b>PCMC</b>	<b>RITM</b>
Total Enrolled Subjects	1243	2247	2450
Clinical Pneumonia	1117 (89.8%)	1898 (84.4%)	1685 (68.7%)
Pneumonia Incidence Rate/100,000	4,725	2,353	3,111



# Younger Children Bore the Greatest Burden of Pneumonia





# Risk factors for Pneumonia:

Definite	Likely	Possible
<ul style="list-style-type: none"><li>▪ Malnutrition</li><li>▪ Low birth weight</li><li>▪ Non-exclusive breastfeeding (1<sup>st</sup> 4 mos of life)</li><li>▪ Lack of measles immunization</li><li>▪ Indoor air pollution</li><li>▪ Crowding</li></ul>	<ul style="list-style-type: none"><li>▪ Parental smoking</li><li>▪ Zinc deficiency</li><li>▪ Mother's experience as caregiver</li><li>▪ Concomitant diseases (diarrhea, heart dis, asthma)</li></ul>	<ul style="list-style-type: none"><li>▪ Mother's education</li><li>▪ Day-care attendance</li><li>▪ Rainfall (humidity)</li><li>▪ High altitude (cold air)</li><li>▪ Vit. A deficiency</li><li>▪ Birth order</li><li>▪ Outdoor air pollution</li></ul>

# Outcome of Childhood Pneumonia EVRMC 2008-2011



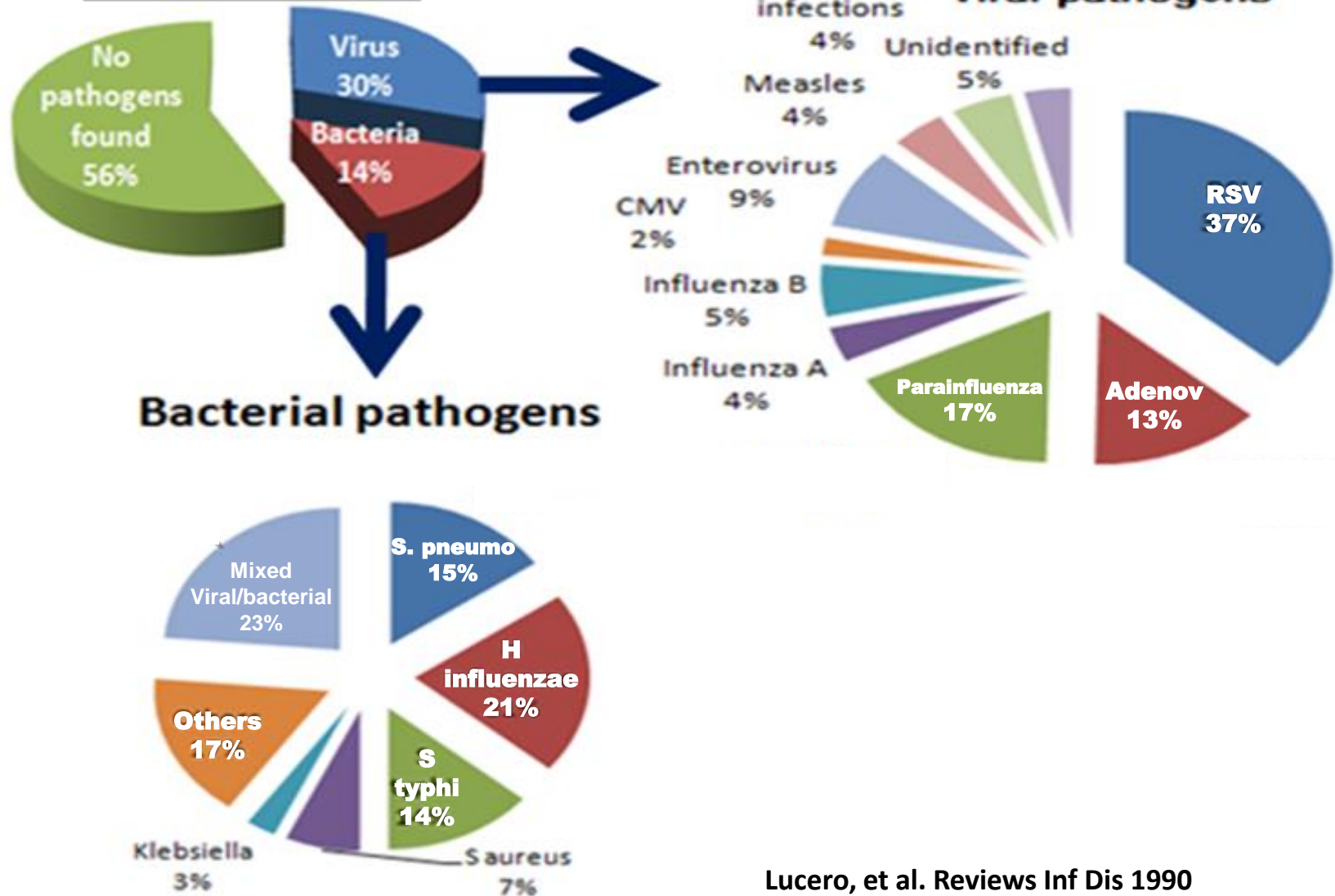
	Died	Total
Pneumonia, neonatal	1 (4.7%)	21
Pneumonia	9 (6.5%)	137
Pneumonia, severe	20 (2.4%)	817
Pneumonia, very severe	78 (12.8%)	605
<b>Mortality Rate</b>	<b>26.4%</b>	<b>1,580</b>

Lupisan et al Asia-Africa Congress on Emerging and Re-emerging Infections  
Kobe, Japan January 2012

# Etiology of Pneumonia in <5 Years Old

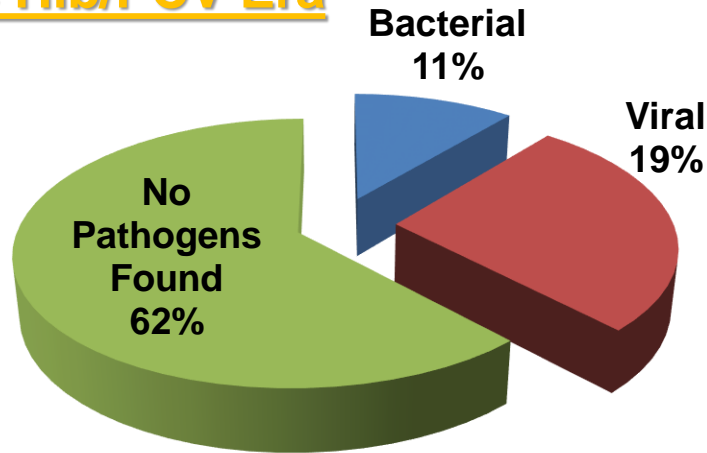
1984-1986, RITM, N=537

## Pre Hib/PCV Era



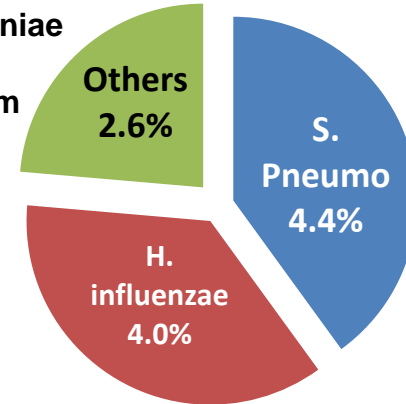
# Etiology of Pneumonia in <5 Years Old 1990-1992, RITM, N=332

## Pre Hib/PCV Era

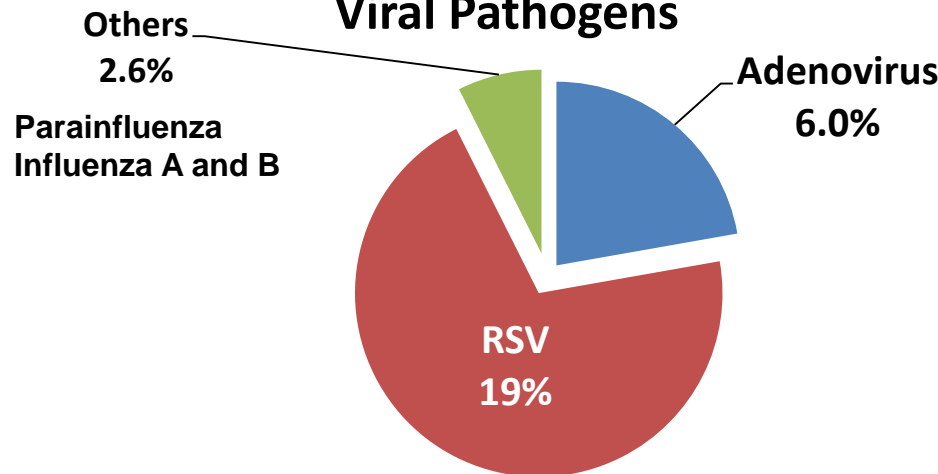


## Bacterial Pathogens

S. aureus  
K. pneumoniae  
S. viridans  
A. anitratum



## Viral Pathogens

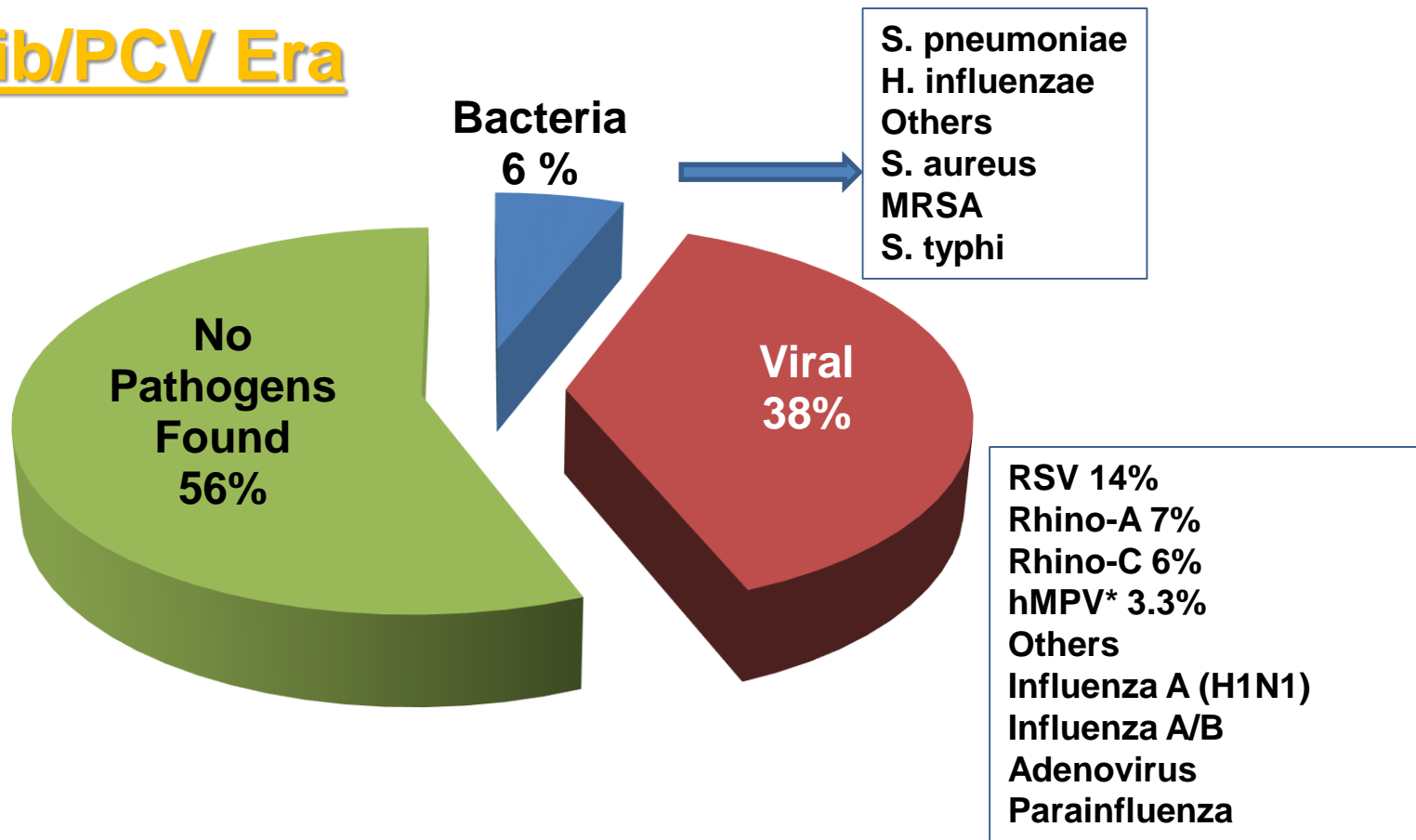


Capeding et al. Etiology of ALRI in Filipino Children under 5 years  
Southeast Asian J Trop Med Public Health, Dec. 1994

# Etiology of Pneumonia in <5 Years Old

## 2008-2011, EVRMC N=1582

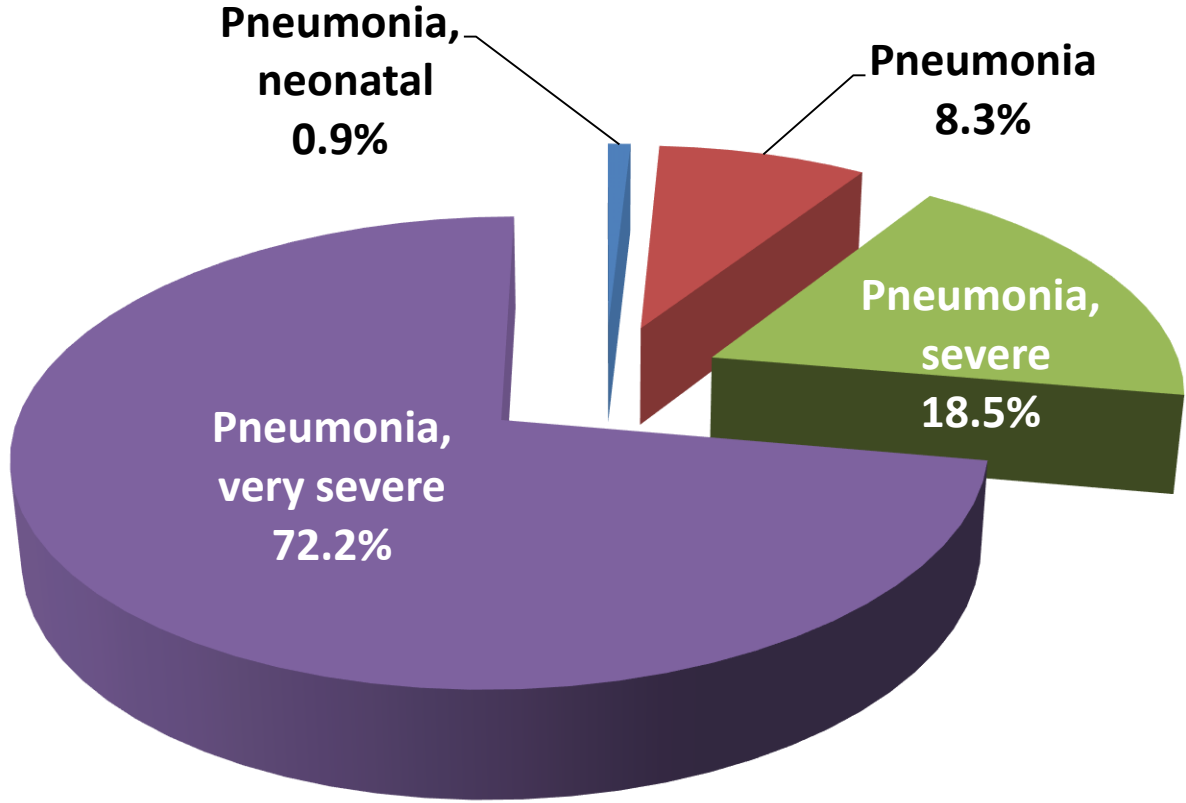
### Hib/PCV Era



# Determining Bacterial Etiology in Childhood Pneumonia is Challenging

- Use of conventional bacterial culture considered as gold standard but with low sensitivity
- Bacteria (*S. pneumoniae*, *H. influenzae*) are fastidious organisms
- High percentage of antibiotic usage prior to hospitalization

# Mortality Rate by Case Definitions EVRMC



**Total number of cases = 108**

# Risk Classification for Pneumonia-Related Mortality

Variables	PCAP A Minimal risk	PCAP B Low risk	PCAP C Moderate Risk	PCAP D High risk
1. Co-morbid illness <sup>b</sup>	None	Present	Present	Present
2. Compliant caregiver <sup>c</sup>	Yes	Yes	No	No
3. Ability to follow up <sup>c</sup>	Possible	Possible	Not possible	Not possible
4. Presence of dehydration <sup>d</sup>	None	Mild	Moderate	Severe
5. Ability to feed	Able	Able	Unable	Unable
6. Age	> 11 mo	>11 mo	<11 mo	<11 mo
7. Respiratory rate <sup>e</sup> 2-12 months 1-5 years >5 years	≥ 50/min ≥40/min ≥30/min	>50/min >40/min >30/min	>60/min >50/min >35min	>70/min >50/min >35min





# Risk Classification for Pneumonia-Related Mortality

Variables	PCAP A Minimal risk	PCAP B Low risk	PCAP C Moderate Risk	PCAP D High risk
<b>8. Signs of resp failure</b>				
a. Retraction	None	None	Intercostal/ Subcostal	Supraclavicular/ intercostal/ Subcostal
b. Head bobbing	None	None	Present	Present
c. Cyanosis	None	None	Present	Present
d. Grunting	None	None	None	Present
e. Apnea	None	None	None	Present
f. Sensorium	Awake	Awake	Irritable	Lethargic/ Stuporous/ comatose
<b>9. Complications [effusion, pneumothorax]</b>	None	None	Present	Present
<b>ACTION PLAN</b>	OPD <sup>F</sup> Follow-up at the end of treatment	OPD <sup>F</sup> Follow-up after 3 days	Admit to regular ward	Admit to a critical care unit Refer to Specialist

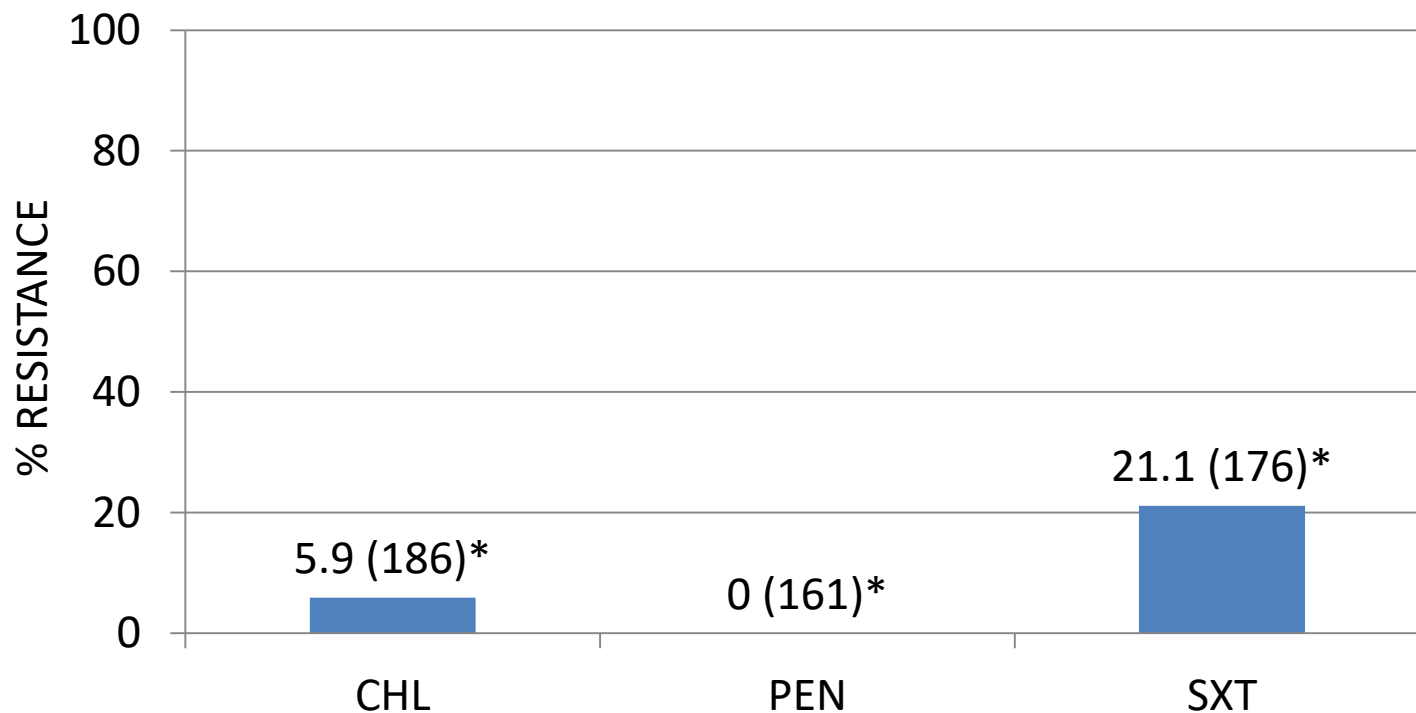




# Empiric Antibiotic Treatment

1. PCAP A or B without previous antibiotic
  - Oral amoxicillin, drug of choice
2. PCAP C without previous antibiotic and complete Hib vaccination.
  - Penicillin G, drug of choice
3. PCAP C with incomplete Hib vaccination
  - Ampicillin IV
4. PCAP D
  - Refer to Specialist

# Percent Resistance of *S. pneumoniae* Jan-Dec 2010



**CHL**=Chloramphenicol **PEN**=Penicillin **SXT**=Cotrimoxazole

\*%R(N)



# Clinical Management of Viral Etiology

1. In laboratory confirmed influenza A or B virus infection.
  - a. Influenza A: amantadine for 3-5 days, an option to discontinue within 24-48 hours after resolution of symptoms
  - b. Influenza A or B: oseltamivir for 5 days
2. Both drugs should be administered within 48 hours of onset of symptoms, ineffective against respiratory viruses other than influenza, not recommended for children below 1 year old

# Burden of Pneumonia Over the Past Decades

- Pneumonia is the most common presentation of IPD in children.
- Most commonly affects the very young
- *S. pneumoniae*, *H. influenzae* and RSV consistently are the most frequently detected pathogens
- Pneumonia is the top killer of Filipino children <5 years old, accounts for 34% of deaths

