

Review

Child pneumonia – focus on the Western Pacific Region

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EDUCATIONAL AIMS

The reader will come to appreciate that in the Western Pacific region:

- Pneumonia is a major cause of death in young children
- The pneumonia pathogen profile is variable and changing with increased uptake of conjugated vaccines
- The rise of drug resistant infections is fostered by inappropriate antimicrobial use
- Clinical management protocols and primary pneumonia prevention strategies can be strengthened

ARTICLE INFO

Keywords:

Child
pneumonia
acute respiratory infection
epidemiology
aetiology
management
vaccination
antibiotic stewardship

SUMMARY

Worldwide, pneumonia is the leading cause of death in infants and young children (aged <5 years). We provide an overview of the global pneumonia disease burden, as well as the aetiology and management practices in different parts of the world, with a specific focus on the WHO Western Pacific Region. In 2011, the Western Pacific region had an estimated 0.11 pneumonia episodes per child-year with 61,900 pneumonia-related deaths in children less than 5 years of age. The majority (>75%) of pneumonia deaths occurred in six countries; Cambodia, China, Laos, Papua New Guinea, the Philippines and Viet Nam. Historically *Streptococcus pneumoniae* and *Haemophilus influenzae* were the commonest causes of severe pneumonia and pneumonia-related deaths in young children, but this is changing with the introduction of highly effective conjugate vaccines and socio-economic development. The relative contribution of viruses and atypical bacteria appear to be increasing and traditional case management approaches may require revision to accommodate increased uptake of conjugated vaccines in the Western Pacific region. Careful consideration should be given to risk reduction strategies, enhanced vaccination coverage, improved management of hypoxaemia and antibiotic stewardship.

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INTRODUCTION

Pneumonia is the biggest killer of young children; globally accounting for nearly one in five deaths among children less than 5 years of age in 2011 [1,2]. The epidemiology of child

pneumonia, as well as the pathogen profile and management practices, is variable in different parts of the world [2]. The greater Asia-Pacific region, which includes the World Health Organization (WHO) defined regions of Southeast Asia and the Western Pacific, reports the greatest number of pneumonia cases in children every year (Figure 1) [1,3]. We review global pneumonia disease burden estimates, consider the importance of various respiratory pathogens and discuss standard management approaches in infants and children less than five years of age, with a focus on the WHO Western Pacific Region; Viet Nam in particular.

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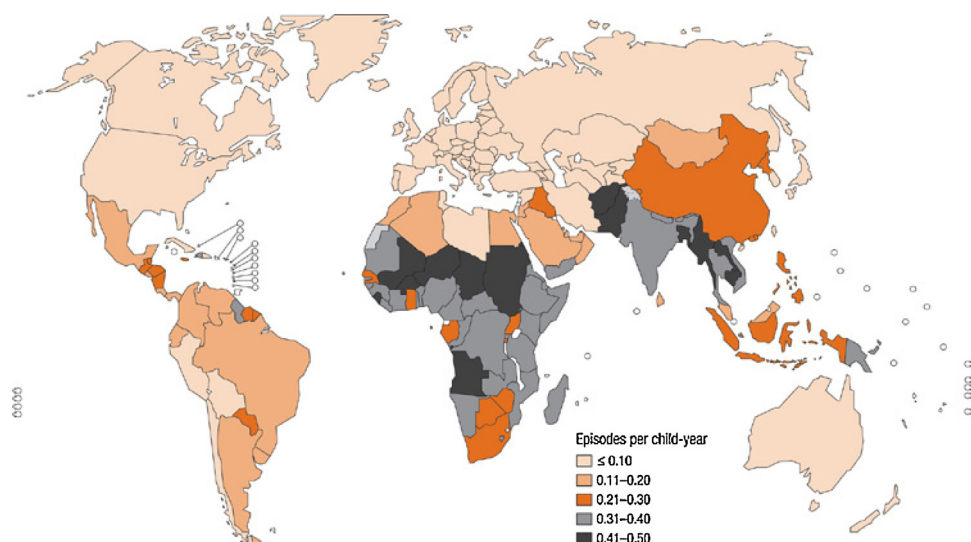


Figure 1. Estimated incidence of clinical pneumonia in children less than 5 years of age (2008).^{*} Small circles represent island populations.

^{*}Adapted from World Health Organization 2008 [3].

BURDEN OF CHILD PNEUMONIA

In 2011, child pneumonia accounted for an estimated 1.3 million deaths, with more than 90% occurring in low and middle income countries [1,4]. Africa experienced the highest disease burden with an estimated 0.27 pneumonia episodes per child-year and 540,600 pneumonia-related deaths in children under 5 years of age, followed by South-East Asia (0.26 pneumonia episodes per child-year; 443,800 deaths) [1]. Estimates for the Western Pacific were 0.11 pneumonia episodes per child-year with 61,900 pneumonia-related deaths [1]. Table 1 summarizes the pneumonia disease burden and number of pneumonia-related deaths estimated to have occurred in the various WHO regions in 2011.

In the WHO Western Pacific Region, the pneumonia-related under-5 mortality rate decreased from 52.1 per 1000 live births in 1990 to 35.5 per 1000 live births in 2000 and 15.3 per 1000 live births in 2013. Data on pneumonia disease episodes are less complete, but declined from 850,000 in 2000 to 395,000 in 2013 [5]. Despite these impressive reductions, pneumonia remains one of the biggest killers of young children. In 2015, 14% of under-5 deaths in the WHO Western Pacific region were attributed to pneumonia [5]. Other causes of under-5 mortality were mostly concentrated in the neonatal period, including prematurity (16%), intra-partum complications (13%), congenital anomalies (13%) and

neonatal sepsis (4%), with injuries (11%) and diarrhea (6%) making substantial contributions in the post-neonatal period [5]. The available data indicate that the majority (>75%) of pneumonia-related deaths occur in six countries; Cambodia, China, Laos, Papua New Guinea, the Philippines and Viet Nam [6]. Table 2 provides a country-specific breakdown of the pneumonia-related disease burden in the Western Pacific Region.

In 2008, the WHO included Viet Nam among 15 “high child pneumonia countries” with an estimated 2.9 million cases and 0.35 pneumonia episodes per child-year in children less than 5 years of age [3]. Despite recent progress, the pneumonia disease burden in Viet Nam remains nearly 10 times higher than in developed country settings like Australia and Europe. In 2015, WHO estimated that acute respiratory infection accounted for 11% of under-5 mortality in Viet Nam; while human immunodeficiency virus (HIV) infection and malaria combined, accounted for less than 2% [5]. To achieve further reductions in pneumonia incidence and pneumonia-related deaths, careful assessment of risk factors and local clinical practice is required to optimize prevention and care.

CAUSES OF CHILD PNEUMONIA

Knowledge of the most common causative pathogens informs strategies for case management and prevention [7]. Table 3

Table 1

Estimated pneumonia disease burden in children less than 5 years of age by WHO region.^{*}

WHO Region	Population (<5yrs of age)	Estimated Disease Burden n (95% confidence interval)		
		Episodes per child- year	Total Episodes (x10 ⁶)	Total Deaths (x10 ³)
Africa	133,340,762	0.27 (0.14–0.63)	36.4 (18.2–84.4)	540.6 (43.8–627.3)
Americas	76,995,700	0.08 (0.04–0.18)	6.4 (3.3–14.5)	23.9 (22.6–35.6)
Eastern Mediterranean	72,151,965	0.23 (0.11–0.53)	16.4 (8.2–38.0)	168.4 (147.3–217.1)
Europe	54,605,243	0.03 (0.02–0.04)	1.6 (1.3–2.1)	18.1 (14.7–23.4)
South East Asia	179,956,087	0.26 (0.13–0.61)	47.4 (23.7–109.8)	443.8 (336.7–534.2)
Western Pacific	116,411,580	0.11 (0.05–0.24)	12.2 (6.2–28.2)	61.9 (50.7–78.0)
World	633,461,337	0.19 (0.10–0.44)	120.4 (60.8–277.0)	1256.8 (1053.2–1482.9)

WHO – World Health Organization; yrs – years.

^{*} Estimates for 2011 [1].

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