



Progress towards universal access to pneumonia treatment

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Pneumonia and diarrhoea are responsible for almost a quarter of all deaths among children under 5 in 2015

- Every day, pneumonia and diarrhoea kill more than 4,000 children around the world
- 1.4 million children under 5 died from these two diseases in 2015
- 80 per cent of deaths associated with pneumonia occur during the first two years of life

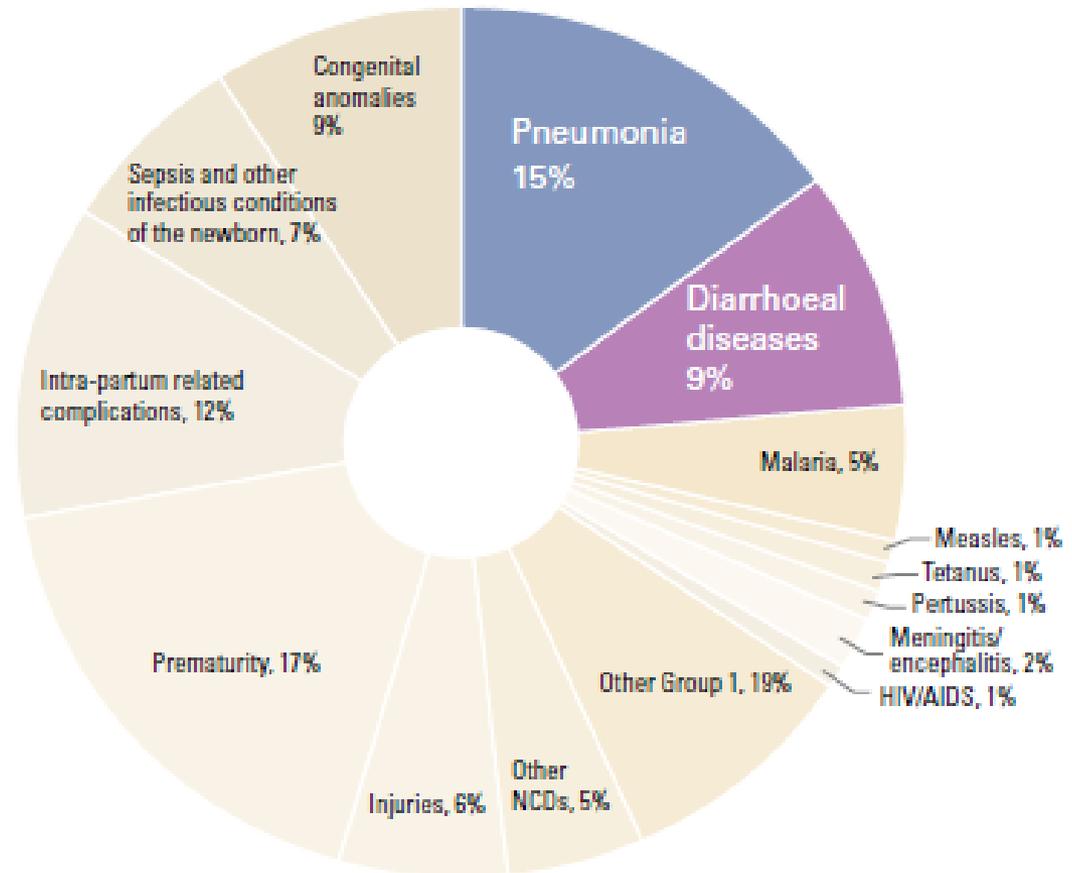


Figure 1: Distribution of causes of death among children under 5 in 2015

Most pneumonia and diarrhoea deaths are concentrated in South Asia and sub-Saharan Africa – and the proportion of deaths shouldered by these regions has continued to rise

Figure 3a: Distribution of under-five deaths due to pneumonia in 2000 and 2015 by UNICEF region

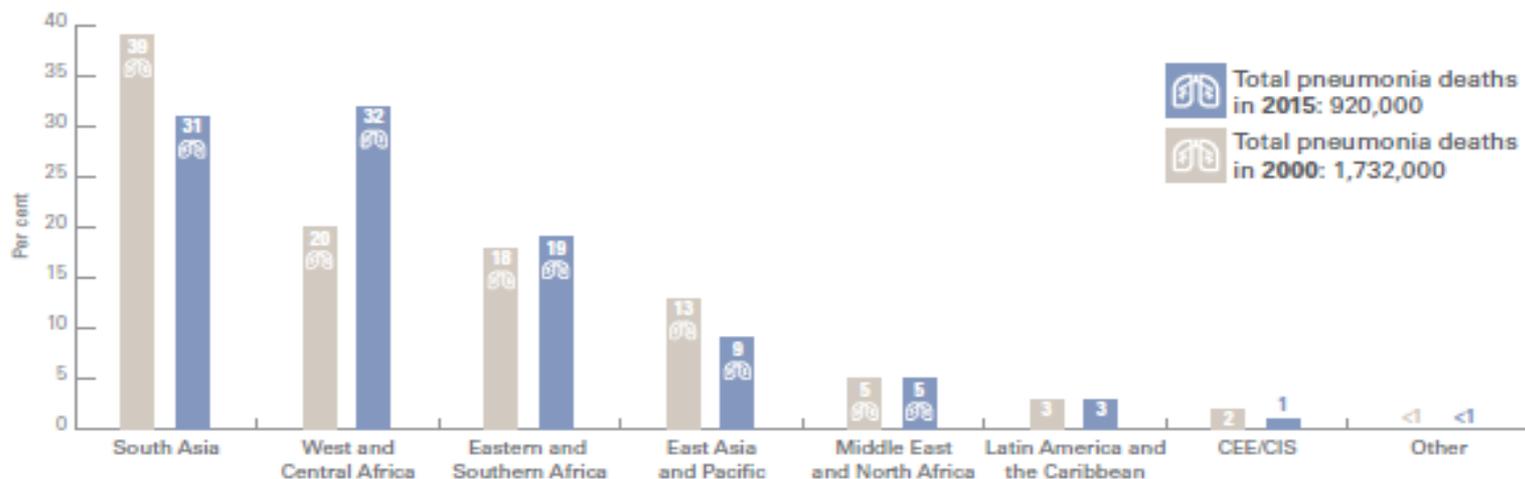
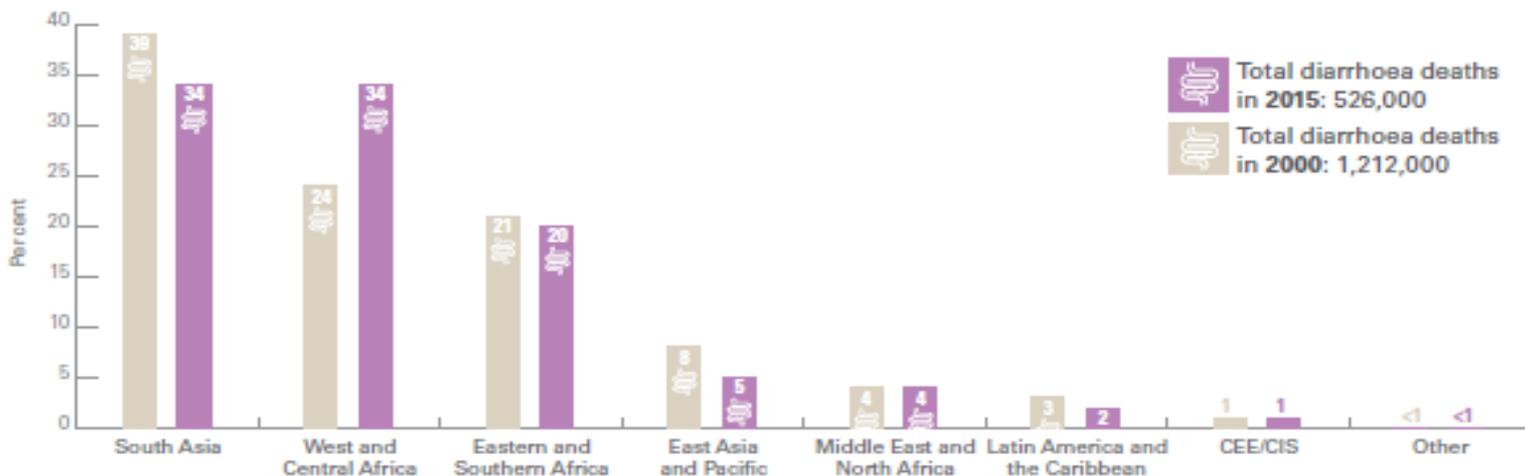


Figure 3b: Distribution of under-five deaths due to diarrhoea in 2000 and 2015 by UNICEF region



Source: WHO and Maternal and Child Epidemiology Estimation Group (MCEE) estimates 2015

Early identification and treatment of pneumonia symptoms saves lives

- Of the 5.9 million deaths in children under five that occurred in 2015, pneumonia caused 15% (UNICEF 2016); most of these deaths are readily preventable or treatable (Jones *et al* Lancet 2003)
- Case-fatality rate in untreated children with pneumonia is high, sometimes exceeding 20% and death can occur after just three days of illness (Dio A WHO 1983; Reyes H *et al* Health Policy Plan 1997)
- By initiating antibiotic therapy soon after onset of pneumonia symptoms the progression of a pneumonia infection is blunted (Ghimire M WHO Bulletin 2010)
- In the absence of early intervention, pneumonia progresses to a state where even intravenous antibiotics have limited impact → high hospital case fatality rates for children admitted for pneumonia (Berkley JA *et al* BMJ 2003; Asghar R *et al* BMJ 2008)

Mild and severe pneumonia can be effectively managed at home

- 15 million hospital admissions for severe and very severe pneumonia globally in 2010; 0.3 million ended in death (Nair *et al* Lancet 2013)
- Delayed care-seeking or poor access to care providers is commonly observed in children who die of pneumonia (Kallander *et al* WHO Bulletin 2008)
- Controlled trials from Asia show that management of both uncomplicated and severe pneumonia cases can be effectively treated with oral antibiotics at home (Sazawal S, Black RE Lancet Infect Dis 2003; Soofi S *et al* Lancet 2012; Bari A *et al* Lancet 2011)
- As a result, low and middle income countries have adopted community case management of sick children using standard case management guidelines recommended by WHO and UNICEF (Young M *et al* Am J Trop Med Hyg 2012)
- When these guidelines are followed, children are treated more promptly, antibiotics are used more appropriately and mortality is reduced (Kalyango JN *et al* Malaria J 2013; Gouws E *et al* WHO Bulletin 2004; Theodoratou E *et al* Int J Epidemiol 2010)

Management of severe pneumonia

- In 2014, WHO released new guidelines for treatment of outpatients with lower chest indrawing pneumonia ('severe pneumonia') with oral amoxicillin (WHO IMCI 2014; WHO. Pocket book of hospital care for children 2014)
- New guidelines are likely to reduce societal costs (less hospitalisation), and deliver better outcomes. (Fox MP et al Clin Infect Dis 2013)
- Several studies planned or ongoing in sub-Saharan Africa to establish the safety and efficacy of management of severe pneumonia at community level with results expected in late 2016 (Malaria Consortium 2015)

Integrated Management of Childhood Illness

Chart Booklet



March 2014

Diagnosis of pneumonia is largely presumptive

- Identification of pneumonia symptoms is primarily based on counting breaths in children with cough or difficult breathing
- Some argue that CHWs have insufficient capacity to correctly diagnose and treat symptoms of pneumonia and that evidence of the efficacy of antibiotic treatment for 'fast breathing pneumonia' is questionable (Druetz *et al* Health Policy Plan 2015; Lassi ZS, *et al* Cochrane Database Syst Rev. 2014)
- Yet, a multi-centric randomised placebo controlled double blind clinical trial show that treatment failure was higher among children with non-severe pneumonia and wheeze treated with placebo compared to amoxicillin (Awasthi S *et al* PLoS One 2008)
- Recent research has tried, but failed, to identify other clinical features to better diagnose pneumonia (Rambaud-Althaus C *et al* Lancet Infect Dis 2015)
- Better tools for to support frontline health workers to detect the signs and symptoms of pneumonia, often through counting RR, are essential

Pulse oximetry – an essential tool to detect children at risk of fatal outcomes

- Oxygen saturation is a good marker for disease severity and is often associated with fatal outcome, both in children with severe pneumonia and severe malaria (Duke *et al* Int J Tuberc Lung Disease 2001; Orimadegun A *et al* Afr Health Sci. 2014)
- Pulse oximetry is a reliable and non-invasive method for identifying hypoxaemia in children; yet pulse oximeters are rarely available outside the higher-level facilities in resource-constrained countries (Ginsburg AS *et al* J Trop Pediatr 2012)
- Significant innovation has recently occurred, with the development of miniaturised and solar powered devices, pulse oximeters using plesmographic wave to calculate RR and combined RR counters and pulse oximeters on mobile phones

Pulse oximetry for identification and management of hypoxaemia

- The benefits of pulse oximetry has recently led to inclusion into standard case management guidelines at OPD and emergency units at health centres or hospitals (WHO IMCI 2014; WHO. Pocket book of hospital care for children 2014)
- However their clinical performance and cost-effectiveness, especially at community level, has been questioned (Advanced Strategies preliminary results)
- Establishing the accuracy, usability, acceptability and utility of pulse oximeters that can be implemented at scale in low-income countries is a priority
- Result expected to inform national and global (WHO and UNICEF) guidelines on the introduction of pulse oximeters in clinical care
- Taking a holistic view of the health system when introducing new tools is essential, such as drug supply, drug formulation, referral systems and oxygen therapy for children identified with hypoxaemia

Thank you

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