PAVING THE WAY TO DECREASED CHILD PNEUMONIA MORTALITY

Despite major advances in medical sciences in recent decades, global child mortality remains unacceptably high. More than half of child deaths still are due to conditions that could be prevented or treated with access to simple, affordable interventions.

In 1990 more than 12.5 million infants and children under the age of five died. In 2005 the United Nations established a Millennium Development Goal to reduce global child mortality by two-thirds between 1990 and 2015. Achievement of this goal requires the co-ordinated action of multiple countries and organisations. Importantly, it also relies heavily on accurate identification of the leading causes of mortality in children and efficient allocation of available resources.

The list of diseases that contribute to mortality in children is long and includes a broad spectrum of conditions ranging from malnutrition to AIDS and malaria. Considering the dynamic nature of disease outbreaks and the difficulties in gathering accurate information in remote parts of the world, setting priority areas and strategies for combating child mortality is enormously challenging.

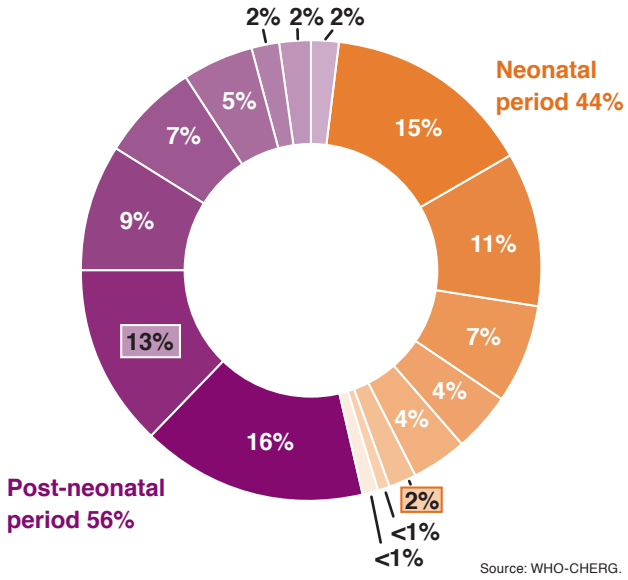
If members of the public were asked which disease is responsible for the largest number of child deaths globally, they might say AIDS, malaria or TB. However, pneumonia is the single largest killer. Until a decade ago, tackling child pneumonia deaths was receiving considerably less global investment and attention than other conditions and too little research was being undertaken.

LEADING CAUSE OF DEATH

Pneumonia is a form of acute respiratory infection that affects the lungs. It is the leading infectious cause of death in children worldwide, accounting for about 15 per cent of all deaths of children under the age of five. In 2013, pneumonia killed an estimated 935,000 children under the age of five.

Pneumonia can be caused by bacteria, viruses and fungi. Streptococcus pneumonia and Haemophilus influenzae type b (Hib) are the most common causes of bacterial pneumonia, and respiratory syncytial virus is the most common viral cause of pneumonia. A yeast-like fungus, Pneumocystis jiroveci, is often responsible for pneumonia deaths in HIV-infected infants.

GLOBAL DISTRIBUTION OF DEATHS AMONG CHILDREN UNDER 5 BY CAUSE, 2013.



Source: WHO-CHERG.

- Other causes 16%
- Pneumonia 13%
- Diarrhoea 9%
- Malaria 7%
- Injury 5%
- Meningitis 2%
- AIDS 2%
- Measles 2%
- Preterm birth complications 15%
- Birth-related complications 11%
- Sepsis 7%
- Congenital abnormalities 4%
- Other 4%
- Pneumonia 2%
- Tetanus <1%
- Diarrhoea <1%

PUTTING RESEARCH INTO ACTION – ESTIMATING CHILD PNEUMONIA RATES

Child pneumonia has long been a focus for University of Edinburgh researchers Professor Harry Campbell and Professor Igor Rudan, who have conducted a substantial body of epidemiological research on the subject, publishing more than 50 papers. These include estimates of disease burden, pneumonia vaccine immunogenicity, prevalence of risk factors and estimates of effectiveness of interventions.

Professors Campbell and Rudan were founding members and the pneumonia technical experts of the Child Health Epidemiology Reference Group (CHERG), which was established jointly by the World Health Organisation (WHO) and the United Nations Children's Fund (UNICEF) to conduct research to prepare global child disease burden estimates and advise international agencies and national governments. Their research on pneumonia mortality, under the auspices of CHERG, involved extensive systematic literature review (including Chinese language databases) and identification of unpublished data sources coupled with interpretation and assembly of routine death certification (vital registration) from every country. It also covered verbal autopsy data from large international surveys. The analysis involved complex statistical modelling of data.

They demonstrated that although pneumonia was the largest single cause of global child mortality in 2008, it was receiving considerably less global investment and attention than other conditions such as HIV and malaria.

CHERG detailed the major causes of child death and estimated the magnitude of this burden for more than 170 countries since the year 2000. These data were embraced by major international agencies including WHO, UNICEF, the Bill and Melinda Gates Foundation, Save the Children Fund and others.

Professors Campbell and Rudan have also regularly acted as advisers and working group chairs on child pneumonia to WHO, UNICEF, the UK government and other international agencies. They have contributed to 'The WHO pocketbook of Hospital Care for Children' (Professor Campbell as overall editor and author of the chapter on pneumonia) and published multiple papers on pneumonia risk factors, effectiveness of interventions and related topics. In 2007 Professor Campbell spoke in New York at the global launch of the World Pneumonia Day movement.

IMPACT OF RESEARCH

Work by Professors Campbell and Rudan contributed to the establishment by the WHO and UNICEF, in 2009, of the Global Action Plan on Pneumonia (GAPP), which gives renewed emphasis to pneumonia control. It also accelerated global implementation of pneumonia vaccines by the Global Alliance on Vaccines and Immunisations (GAVI). In 2010, member states of the World Health Assembly (WHA) endorsed the resolution on Control of Pneumonia, committing them to the adoption of pneumonia control policies and actions, and to giving increased priority to this problem. Professor Campbell helped to draft this UK-led initiative and was technical consultant to the UK delegation.

The global under-five mortality rate has declined by nearly half (49 per cent) since 1990, dropping from 90 to 46 deaths per 1,000 live births in 2013. The under-five mortality is falling faster than at any other time during the past two decades. Thanks to the accelerated progress in reducing child mortality, almost 100 million children have survived who would have died had mortality remained at 1990 rates. In recent years pneumonia showed the largest relative and absolute rate of mortality reduction. The Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea launched by the WHO and UNICEF in April 2013 could save up to 1.5 million children annually.

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