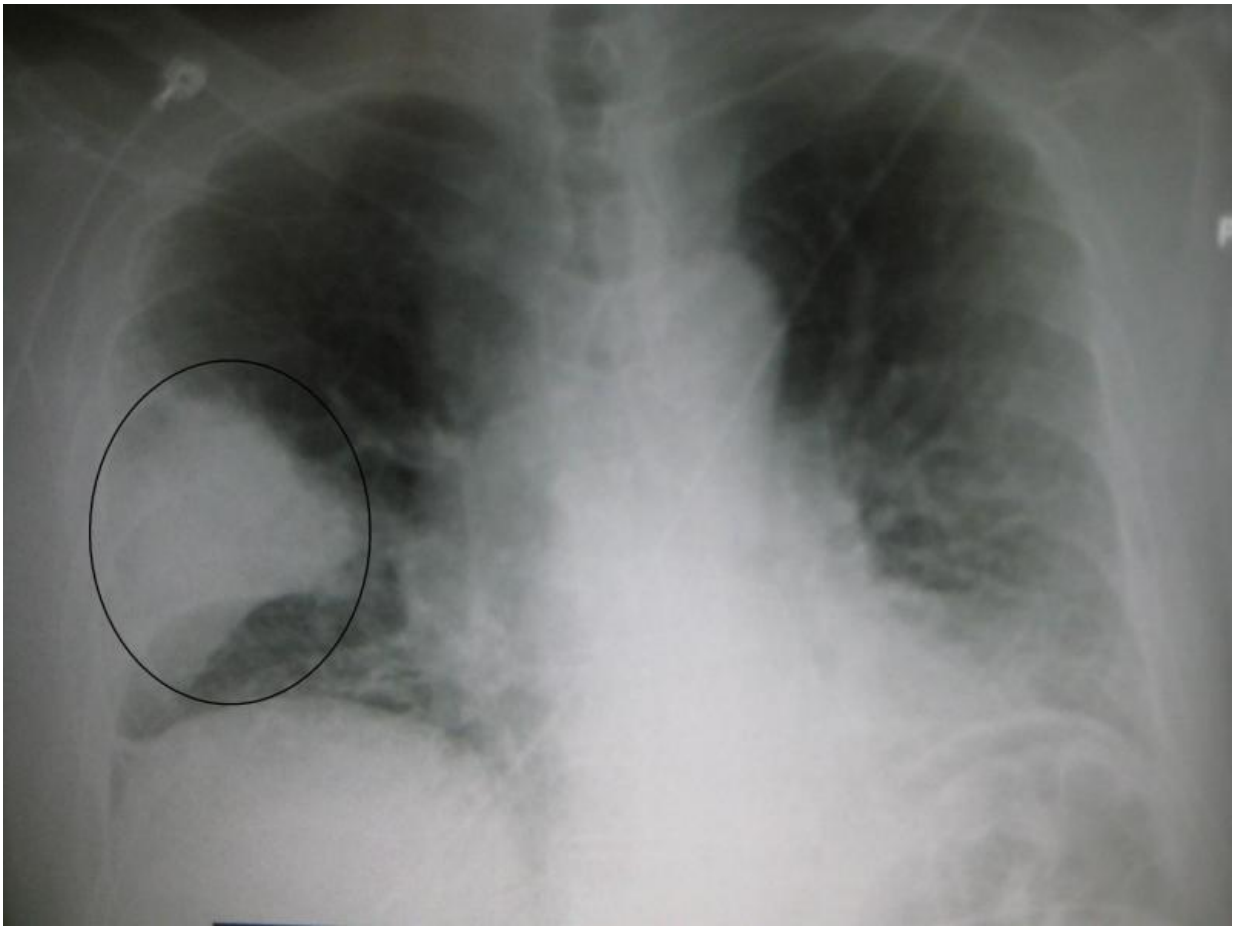
New study: One is seven child deaths result from pneumonia, the flu, other LRIs

October 30 2019



A black and white X-ray picture showing a triangular white area on the left side. A circle highlights the area. Credit: James Heilman, MD./Wikipedia

Despite large declines since 1990 in child deaths from pneumonia and the flu, these and other lower respiratory infections (LRIs) remain a leading killer of children under age 5.

A new scientific study finds LRIs responsible for one in seven child deaths globally.

"Our findings reveal no 'one size fits all' solution exists to reduce child mortality significantly from LRIs in every country," said Dr. Bobby Reiner, senior author on the study and Associate Professor of Health Metrics Sciences at the Institute for Health Metrics and Evaluation at the University of Washington School of Medicine. "So how do we make progress? By tailoring to the needs of each country and by looking holistically at all drivers of change, from air pollution to vaccine coverage, from increasing breastfeeding to antibiotic use."

The study found child LRI deaths fell by 65% globally between 1990 and 2017, decreasing from 2.3 million to 809,000. Those represented 15% of the 5.4 million total child deaths in 2017. Nearly half occurred in India (185,429 deaths), Nigeria (153,069), and Pakistan (40,480) combined.

Of the 195 countries studied, Niger saw the largest decline in mortality rate, falling by more than 75%, from 1,349 deaths per 100,000 children, the highest rate worldwide in 1990, to 330 in 2017.

Yet the pace of progress for LRIs has lagged behind that of other childhood infectious diseases, such as tetanus and measles.

The study is part of the annual Global Burden of Disease (GBD). Published today in the international medical journal *The Lancet Infectious Diseases*, the analysis provides comparable estimates of LRI mortality and associated risk factors across 195 countries and territories.

In addition to flu and pneumonia, LRIs include Haemophilus influenza type b (Hib) and other respiratory viruses.

Reiner and co-authors found LRI incidence declined more slowly than LRI mortality in most countries, suggesting improvements in protecting against death are likely outpacing improvements in reducing the underlying risk of infection.

Between 1990 and 2017, the global percentage of people who contracted LRIs and subsequently died was halved, from 2% to 1%. But in 2017 this percentage varied considerably by country, ranging from less than 0.1% in Saudi Arabia and Slovenia to 5.8% in Nigeria.

"Lower respiratory infections remain pernicious and preventable causes of premature death," said Dr. Simon I. Hay, a senior author on the study and Director of the Local Burden of Disease (LBD) group at IHME. "Accelerating their decline is essential for nations seeking to meet the UN's Sustainable Development Goal for under-5 childhood mortality."

Additional GBD findings include:

- In 2017, the highest LRI mortality rate, 528 deaths per 100,000 children, occurred in South Sudan.
- The global child mortality rate from LRI decreased dramatically, by 67%, from 363 deaths per 100,000 children under 5 in 1990 to 119 in 2017.
- At 40%, Uzbekistan had the highest percentage of child deaths attributable to LRI among all countries.
- China and Turkey have had some of the fastest improvements in the Healthcare Access and Quality (HAQ) Index, a composite metric of preventable mortality. This improvement suggests the health care systems in China and Turkey have improved and are likely to have contributed to the rapid declines in LRI mortality.

The GBD study findings show more than half of all child LRI deaths globally in 2017 occurred in Africa. To aid in identifying LRI hot spots, Reiner and Hay recently published a second, more in-depth, study mapping child deaths from LRI in 52 African countries at the level of individual districts. Published on September 30 in Nature Microbiology, the analysis is part of the Local Burden of Disease (LBD) project.

The new LBD precision maps reveal substantial variation in LRI child mortality within each country. By mapping countries in Africa down to the level of second administrative subdivisions, (districts or provinces), they show pockets of progress and hot spots of high risk.

The study found that despite progress overall, a large, contiguous hot spot of high LRI mortality risk extended across 54 divisions in the Central African Republic, South Sudan, Chad, Niger, Cameroon, the Democratic Republic of the Congo, and Nigeria in 2017. This cluster accounted for 31% of all child deaths from LRI in 2017, but included only 13% of the child population in Africa. The research team is working on extending these comprehensive mapping techniques to all low- and middle-income countries, to better understand where interventions could have the biggest impact.

Among the key LBD findings:

- While Somalia and Kenya used to contain some of the divisions with the highest mortality rates across the continent, by 2017 those areas had drastically reduced the risk of a child dying of LRI. Conversely, and against the general trend of reductions in mortality rates, several divisions in South Sudan appear to have increased their childhood LRI mortality rate since 2000.
- The greatest absolute decline in LRI incidence rates among all mapped areas was in the Blue Nile State, in Sudan, from 419 episodes per 1,000 in 2000 to 222 in 2017.

- In 2017, four countries had greater than threefold variation in LRI incidence between mapped units: Nigeria, Somalia, Ethiopia, and Senegal. In Nigeria, Yobe State had some of the highest rates of LRI episodes across all of Africa (148 episodes per 1,000), while Anambra had only 32 episodes per 1,000.
- The Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea (GAPPD) has called for a reduction of childhood mortality due to LRI to fewer than 3 deaths per 1,000 per year by 2025. Forty-one countries studied appear to be on target for every division within their borders, while eleven countries have at least one division that does not appear to be on pace to achieve this goal.

The GBD study is entitled "Quantifying risks and interventions that have affected the burden of lower respiratory infections among children younger than 5 years: an analysis of the Global Burden of Disease study 2017." The LBD study published in *Nature Microbiology* on September 30 is entitled "Identifying residual hotspots and mapping lower respiratory infection morbidity and mortality in African children from 2000 to 2017."

More information: *The Lancet Infectious Diseases* (2019). DOI: 10.1016/S1473-3099(19)30410-4

Provided by Institute for Health Metrics and Evaluation