

Pneumonia revealed in a cough

June 27 2013



(Medical Xpress)—A new method, which analyzes the sounds in a child's cough, could soon be used in poor, remote regions to diagnose childhood pneumonia reliably. According to Udantha Abeyratne from the University of Queensland in Australia and colleagues, this simple technique of recording coughs with a microphone on the patient's bedside table, has the potential to revolutionize the management of childhood pneumonia in remote regions around the world. Their work is published online in Springer's journal *Annals of Biomedical Engineering*.

Pneumonia is the leading killer of young children around the world. Since it is largely a disease of poverty, the vast majority of deaths occur in resource-poor regions such as sub-Saharan Africa, South Asia and remote areas of China. The lack of laboratory testing facilities and

trained healthcare personnel in these regions mean difficulties in the timely diagnosis and adequate treatment of childhood pneumonia.

At the moment, community workers in these regions use the World Health Organization's simple clinical algorithm to diagnose pneumonia. However there are some limitations, including the high rate of false positive results which lead to over-prescription of rare antibiotic stocks.

Abeyratne and team's work identifies an easy-to-use alternative that addresses these challenges, in the form of new technology which analyzes cough sounds to diagnose pneumonia. Indeed, cough is a main symptom of pneumonia and carries vital information on the [lower respiratory tract](#) - consolidation of the lungs and [secretions](#) in particular. These markers of infection alter the acoustic properties of coughs helping to identify pneumonia-specific features.

The researchers analyzed 815 cough events recorded from a total of 91 hospitalized children with and without pneumonia, at the Sardjito Hospital of Gadjah Mada University in Indonesia. Cough sounds were collected by microphones placed on nearby bedside tables. Coughs were classified as either pneumonic or non-pneumonic. The researchers used the overall clinical diagnosis provided by pediatric respiratory clinicians - aided with routine diagnostic technologies - to validate the sound analysis. From the analysis of cough sounds alone, this new technique was able to identify pneumonia cases with over 90 percent sensitivity, meaning that it identifies most patients who actually have pneumonia. In addition, it did so with a low false positive rate, outperforming the existing WHO algorithm for resource-poor regions.

The authors conclude: "Our results indicate the feasibility of taking a cough-centered approach to the diagnosis of childhood pneumonia in resource-poor regions. The technology, in its simplest version, will require between 5-10 [cough](#) sounds and will automatically and

immediately provide a diagnosis without requiring physical contact with patients. Such a system, if successful, is expected to be a paradigm-shifting novelty in the field of [pneumonia](#) diagnosis in remote regions."

More information: *Annals of Biomedical Engineering*. [DOI: 10.1007/s10439-013-0836-0](#)

Provided by Springer

Citation: Pneumonia revealed in a cough (2013, June 27) retrieved 4 May 2024 from <https://medicalxpress.com/news/2013-06-pneumonia-revealed.html>

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