Editorial

Editorial: Breathing New Life Into Pneumonia Epidemiology

Pneumonia kills more children than any other illness, according to the World Health Organization (1). In spite of its disease burden and the fact that there are effective health interventions, pneumonia is a disease that has received neither the public attention nor the funding that it deserves (2). In a recent review sponsored by The George Institute for International Health, pneumonia research was the most glaringly underfunded of all the major "neglected" diseases (3).

The gap in research is perhaps most evident in the field of pneumonia epidemiology. A recent systematic review of childhood pneumonia by the World Health Organization found that of 2,200 published manuscripts, only 28 were deemed of adequate quality for inclusion in a review and modeling exercise (4). The first-ever World Pneumonia Day—November 2, 2009—provides a useful opportunity to consider the challenges and opportunities for epidemiologic research in pneumonia.

The epidemiologic study of pneumonia is hampered by many methodological challenges. Case definitions for the clinical syndrome of pneumonia have traditionally been inconsistent. Interobserver variations in the interpretation of chest radiographs and chest auscultation, for example, have limited the utility of these relatively specific diagnostic techniques (5). Other techniques, such as counting respiratory rate or observing signs of difficult breathing such as chest in-drawing, are more readily standardized but have lower specificity, particularly in areas with a high rate of malaria (6).

Etiology-specific diagnoses are similarly hampered by traditional methods. The use of blood cultures, for example, is highly specific but insensitive, in that it detects only a fraction of the bacterial causes of pneumonia and becomes even less sensitive if the patient has received antibiotics before specimen collection. Sampling the upper respiratory tract, on the other hand, may yield agents that are being carried (i.e., colonizing organisms) and not the cause of the acute episode. Lastly, the study of very severe and fatal childhood pneumonia is complicated by the fact that most episodes occur in the very populations not served by adequate health systems (i.e., children in developing countries); as a result, these populations are often left out of epidemiologic research.

With advances in diagnostic technology and collaborative interactions, the challenges of the past are increasingly solvable. Digital radiographs, for example, can help minimize interobserver variation by transmitting all images to a single reviewer. Using new techniques to detect nucleic acids rather than relying on isolation of viable pathogens should also help with etiologic-specific diagnoses. Finally, the use of geographic information systems and community-based researchers can help assure that all populations are studied and, where they are missed, that bias and underreporting are quantified. With approximately 2 million child deaths every year due to pneumonia, and hundreds of millions of cases each year in both children and adults, new efforts to study the epidemiology of pneumonia worldwide—using the latest techniques and methods—are urgently needed (1). The effort to generate a new evidence base of pneumonia epidemiology will require concerted action by investigators, sponsors, and journals. Investigators must work to develop standardized methods and case definitions while pursuing creative approaches to overcoming historical obstacles. Sponsors need to realign their funding investments to levels commensurate with the burden of pneumonia worldwide. Journals, such as this one, can also play a part by encouraging the reporting of pneumonia epidemiology studies in ways that allow the quality of the research to be carefully assessed and any biases determined and quantified. Together, these actions could provide a much-needed increase in the quality and representativeness of epidemiologic data on pneumonia that in turn breathe new life into the fight against this important killer.

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