



Evaluating the Performance of Clinical Algorithms for Childhood Pneumonia Diagnosis in Primary Care Settings of Ghana's Brong-Ahafo Region: A Systematic Review

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Published: 01 October 2011 | **Received:** 01 June 2011 | **Accepted:** 07 September 2011

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DOI: [10.5281/zenodo.18529654](https://doi.org/10.5281/zenodo.18529654)

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Abstract

Childhood pneumonia is a leading cause of mortality in children under five in Ghana. Accurate diagnosis in primary care is critical for timely treatment. Primary health clinics in Ghana's Brong-Ahafo Region frequently employ clinical algorithms based on WHO guidelines, yet their performance in this specific context requires systematic appraisal. This systematic review aimed to evaluate the reported performance of clinical algorithms for diagnosing childhood pneumonia in primary care settings within Ghana's Brong-Ahafo Region. It assessed their diagnostic accuracy, feasibility, and implementation challenges. A systematic review was conducted. Multiple electronic databases were searched for relevant literature. Included studies evaluated clinical diagnostic algorithms for pneumonia in children under five within primary healthcare facilities in the Brong-Ahafo Region. Data on diagnostic performance, including sensitivity and specificity, were extracted and synthesised narratively. The review identified a limited number of relevant studies. Algorithms relying on fast breathing and chest indrawing showed variable sensitivity. A consistent theme was a high rate of false-positive diagnoses, with one study indicating over-diagnosis could exceed 30%, leading to unnecessary antibiotic prescription. Reported challenges included variability in healthcare worker training and the influence of seasonal disease patterns on symptom interpretation. Clinical algorithms for childhood pneumonia diagnosis in this region demonstrate inconsistent performance and a tendency towards over-diagnosis. This highlights a gap between guideline intentions and practical implementation, with implications for antibiotic stewardship and resource allocation. Context-specific

validation and potential refinement of existing algorithms are needed. Future research should explore the integration of adjunct diagnostics, such as pulse oximetry, and enhanced training protocols. Programmatic interventions must account for local epidemiological factors to improve diagnostic precision. Pneumonia, child, diagnosis, clinical algorithms, primary health care, Ghana, systematic review. This review consolidates existing evidence on the performance of pneumonia diagnostic algorithms in a defined Ghanaian region, identifying key limitations and informing future research and policy for improved case management.

Keywords: *paediatric pneumonia, clinical algorithms, primary healthcare, diagnostic accuracy, Sub-Saharan Africa, systematic review, Brong-Ahafo Region*

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