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A Scoping Review of Point-of-Care Ultrasound for Paediatric Pneumonia Diagnosis by Clinical Officers in Rural Liberia: Diagnostic Accuracy and Implementation Feasibility, 2001

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Abstract

Pneumonia remains a leading cause of paediatric mortality in low-resource settings such as Liberia, where diagnostic capacity in rural areas is limited. Clinical officers are often the primary healthcare providers. Point-of-care ultrasound (POCUS) is a potential tool to improve diagnostic accuracy for paediatric pneumonia, but its feasibility and accuracy when used by non-physician clinicians in rural African contexts require evaluation. This scoping review aimed to map and synthesise literature on the diagnostic accuracy and implementation feasibility of a specific POCUS protocol for paediatric pneumonia when used by clinical officers in rural health centres of Bomi County, Liberia. A scoping review was conducted following established frameworks. A systematic search was performed across multiple electronic databases. Studies were screened against pre-defined inclusion criteria focusing on POCUS for paediatric pneumonia, clinical officer operators, and rural Liberian or comparable low-resource settings. Data were charted and analysed thematically. The search yielded a limited but informative body of literature. Findings indicate clinical officers can be trained to perform paediatric lung POCUS with a high degree of accuracy. Key studies reported POCUS demonstrated a sensitivity of over 90% for consolidations compared to clinical examination alone. Key implementation themes included the importance of simplified protocols, sustained mentorship, and integration into existing clinical workflows. Challenges centred on equipment maintenance and supply chain logistics. POCUS shows promise for improving the diagnosis of paediatric pneumonia by clinical officers in rural Liberia. Available evidence, though limited, suggests it can be both accurate and feasible when supported by appropriate training and infrastructure. Further implementation research is needed to develop sustainable training and maintenance models. Policymakers should consider pilot programmes to integrate POCUS into standard paediatric care protocols in rural Liberian health centres. point-of-care ultrasound, paediatric pneumonia, clinical officer, diagnostic accuracy, implementation feasibility, rural

health, Liberia. This review consolidates available evidence on a task-shifted POCUS model for paediatric pneumonia in a representative rural African setting, informing potential scale-up and policy discussions.

Keywords: *Point-of-care ultrasound, Paediatric pneumonia, Diagnostic accuracy, Clinical officers, Sub-Saharan Africa, Implementation feasibility, Rural health services*

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