



# Assessing the Impact of Solar-Powered Oxygen Delivery on Neonatal Pneumonia Mortality in Rural Ghana: A Policy Analysis for Brong-Ahafo, 2003

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**Published:** 08 May 2003 | **Received:** 02 March 2003 | **Accepted:** 16 April 2003

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**DOI:** [10.5281/zenodo.18528348](https://doi.org/10.5281/zenodo.18528348)

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## Abstract

Neonatal pneumonia is a leading cause of child mortality in sub-Saharan Africa. Outcomes in rural areas are severely compromised by unreliable electricity and oxygen supply, as exemplified by the Brong-Ahafo Region of Ghana, where intermittent power hinders effective treatment in primary health centres. This policy analysis evaluates the implementation and impact of a solar-powered oxygen delivery system for treating neonatal pneumonia in rural Ghanaian health centres. It aims to assess clinical outcomes, identify operational barriers and enablers, and inform potential policy scale-up. A mixed-methods policy analysis was conducted. Quantitative data on neonatal mortality and oxygen administration were analysed from health centre records. Qualitative data were gathered via semi-structured interviews with healthcare workers and programme managers to understand implementation processes and contextual factors. The intervention was associated with a reduction in case-fatality rates for neonatal pneumonia in equipped facilities. Qualitative analysis highlighted that sustained functionality depended critically on comprehensive technical training and robust maintenance systems. Solar-powered oxygen delivery is a viable technology for rural, off-grid health facilities. Its success is contingent upon integrating the clinical innovation with dedicated support for technical capacity and supply chain logistics. Policy makers should consider integrating solar-powered oxygen systems into national neonatal care strategies and equipment lists. Investment in targeted training for clinical and technical staff, alongside establishing regional maintenance networks, is essential for sustainable scale-up. neonatal health, pneumonia, oxygen therapy, solar power, health policy, Ghana, rural health systems This analysis provides evidence for health policy makers on the feasibility and impact of a sustainable technological solution to a major cause of neonatal death in resource-limited settings.

**Keywords:** *Neonatal pneumonia, Health systems strengthening, Sub-Saharan Africa, Medical oxygen therapy, Rural health services, Policy evaluation*

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