A Data Descriptor for the Impact of Solar-Powered Oxygen on Paediatric Pneumonia Mortality in Rural Zambia, 2020

M, w, i, l, a, B, a, n, d, a, ,, M, u, l, e, n, g, a, C, h, i, s, e, n, g, a, ,, C, h, a, n, d, a, M, w, a, n, s, a

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Abstract

Pneumonia remains a leading cause of paediatric mortality in sub-Saharan Africa. In rural, low-resource hospitals, unreliable medical oxygen supply, exacerbated by unstable grid electricity, presents a critical barrier to effective treatment. This data descriptor documents a curated clinical dataset compiled to evaluate the impact of solar-powered oxygen delivery systems on pneumonia case fatality rates in paediatric wards of rural Zambian hospitals. Its objective is to provide a detailed, reusable resource for analysing clinical outcomes following health technology interventions in analogous settings. A multi-hospital, observational dataset was assembled from routine paediatric ward registers and patient case notes. It contains de-identified patient-level data on demographics, clinical presentation, treatment (including oxygen therapy), and outcomes for children admitted with a primary diagnosis of pneumonia. Data were collected during periods before and after the installation of the solar-powered oxygen systems. The dataset comprises records for over 1,800 paediatric pneumonia admissions. Preliminary analysis indicates a clinically significant reduction in the case fatality rate following the intervention. An absolute reduction in mortality of approximately five percentage points was observed among hypoxaemic children after system installation. This curated dataset provides an evidence base on the implementation and clinical impact of a solar-powered oxygen intervention. It demonstrates the

feasibility of collecting robust clinical data in challenging rural settings and highlights the potential of such technology to address critical gaps in paediatric care. Researchers should utilise this dataset for further health economic analyses, comparative effectiveness studies, and scalability modelling. Hospital administrators and policymakers may consider it as evidence for investing in reliable oxygen infrastructure for off-grid health facilities. Paediatric pneumonia, medical oxygen, solar power, low-resource settings, clinical outcomes, health technology, Zambia, child health. The dataset was curated by the study investigators from primary hospital records. It is presented here to enable secondary analysis and to support evidence-based decision-making for oxygen access in resource-constrained environments.