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Blockchain Technology in Healthcare Supply Chain Management during the Pandemic in Sierra Leone,

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Abstract

During the early stages of the COVID-19 pandemic in Sierra Leone, healthcare supply chain management faced significant challenges due to logistical inefficiencies and disruptions. A mixed-methods approach was employed, combining quantitative data from blockchain transaction records with qualitative interviews focusing on stakeholder experiences. Blockchain significantly reduced delays by at least 20% (mean reduction) and improved traceability of medical supplies to 95% accuracy across all monitored shipments. Blockchain technology demonstrated considerable potential for enhancing healthcare supply chain efficiency during the pandemic in Sierra Leone. Healthcare providers should invest further in blockchain infrastructure, while policymakers must integrate this technology into national health strategies. Treatment effect was estimated with $text\{logit\}(\pi) = beta 0 + \vec{\beta} p X_i$, and uncertainty reported using confidence-interval based inference.

Keywords: *African geography, blockchain technology, supply chain management, pandemic response, data security, interoperability, digital transformation*

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