

Next-Generation Indian Vaccine Supply Chain: An Integrated Fuzzy DEMATEL ISM Approach

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ABSTRACT

The Integrated Fuzzy Decision-Making Trial and Evaluation Laboratory (DEMATEL) and Interpretive Structural Modelling (ISM) method are two novel approaches to optimising the Indian vaccine supply chain that are presented in this paper. This study aims to address the challenges of supply chain management in the Indian context, taking into account the complexity and dynamic nature of vaccine distribution, particularly in the wake of the COVID-19 pandemic. The methodology uses a Fuzzy DEMATEL framework to determine and examine the main variables affecting the supply chain for vaccines. This method makes it possible to manage the ambiguities and uncertainties that come with making decisions. These elements are then arranged hierarchically using ISM, which makes it easy to see how these factors are related to one another and to different degrees of influence. Insights into areas that need strategic attention, like cold chain logistics, distribution efficiency, and inventory management, are provided by the study, which identifies important supply chain nodes and links. The study also explores how supply chains can benefit from the integration of cutting-edge technologies like blockchain and IoT, which could improve transparency and real-time tracking. Our results imply that the adoption of a Fuzzy DEMATEL ISM approach can greatly improve the vaccine supply chain's resilience and responsiveness in India. This research advances the field by providing a thorough framework that can help supply chain managers and policymakers make well-informed decisions, which will ultimately improve vaccine accessibility and healthcare outcomes in India.

Keywords: Vaccine Supply Chain (VSC), Fuzzy DEMATEL, ISM

How to Cite

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