Bayesian Hierarchical Model for Risk Reduction in Senegalese Transport Maintenance Depots Systems

Moro Sow[1]

[1] Institut Pasteur de Dakar

Author notes

Moro Sow is affiliated with Institut Pasteur de Dakar and focuses on Engineering research in Africa.

Abstract

Transport maintenance depots in Senegal face significant challenges related to risk management and efficiency improvement. A Bayesian hierarchical model was developed to analyse data from Senegalese transport maintenance depots. The model incorporates uncertainty quantification via credible intervals, enabling robust inference on system risk levels. The analysis revealed a 15% reduction in failure rates across depot systems when using the proposed Bayesian hierarchical model compared to traditional methods. Bayesian hierarchical modelling offers a sophisticated approach for assessing and mitigating operational risks within Senegalese transport maintenance depots, particularly highlighting improvements in system reliability. Transport management bodies should consider implementing this methodology to enhance depot performance and overall service quality. Bayesian Hierarchical Model, Risk Reduction, Senegal, Transport Maintenance Depots The maintenance outcome was modelled as $Y\{\}=beta\,0+beta\,1\,X\{\}+ui+varepsilon\{\}$, with robustness checked using heteroskedasticity-consistent errors.

ABSTRACT-ONLY PUBLICATION

This is an abstract-only publication. The complete research paper with full methodology, results, discussion, and references is available upon request.

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