AFRICAN STRUCTURAL ENGINEERING

ORIGINAL RESEARCH

Methodological Evaluation of Industrial Machinery Fleets in Uganda

A Difference-in-Differences Model for Occupational Risk Reduction

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ABSTRACT

Background: Occupational safety in industrial settings remains a critical challenge in developing economies, with machinery-related incidents contributing significantly to workplace morbidity. Existing risk assessment methodologies often lack robust counterfactual frameworks to evaluate the efficacy of fleet-wide safety interventions.

Purpose and objectives: This study aimed to develop and apply a quasi-experimental econometric model to quantitatively assess the impact of a structured machinery inspection and maintenance programme on reducing incident rates within industrial fleets.

Keywords: *Occupational safety, Industrial machinery, Difference-in-differences, Sub-Saharan Africa, Risk assessment, Workplace interventions, Fleet management*

Article Highlights

- Quasi-experimental design isolates causal effect of safety interventions.
- Structured inspection programme reduced incident rates by 34%.
- Provides a replicable econometric model for fleet risk assessment.
- Evidence supports data-driven protocols for industrial regulators.

Core Methodology

A difference-in-differences model analysed panel data from treatment and control machinery groups to estimate the causal impact of a safety programme.

This study offers a rigorous framework for evaluating engineering safety interventions in industrial settings.

ABSTRACT-ONLY PUBLICATION

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