

# A Randomised Field Trial for Risk Reduction in Tanzanian Industrial Machinery Fleet Diagnostics and Maintenance Governance

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## ABSTRACT

**Background:** Industrial machinery fleets in developing economies often operate under suboptimal maintenance regimes, leading to elevated safety risks and economic losses. A critical evidence gap exists regarding the efficacy of structured diagnostic protocols within real-world governance frameworks.

**Purpose and objectives:** This policy analysis evaluates a randomised field trial designed to measure risk reduction achieved through implementing a standardised diagnostic and maintenance governance system for industrial machinery fleets.

**Keywords:** *Randomised controlled trial, Maintenance governance, Industrial machinery fleets, Sub-Saharan Africa, Risk reduction, Engineering policy analysis, Field experiment*

### Article Highlights

- Randomised trial shows 34.2 pp reduction in major subsystem failures.
- Integrated diagnostic protocols with governance training drive compliance.
- Improved documentation and communication are key enabling factors.
- Evidence supports mandated adoption of certified diagnostic systems.

### Methodological Note

Difference-in-differences analysis with cluster-robust inference quantifies the causal impact of the bundled diagnostic and governance intervention.

*This study provides the first experimental evidence on this bundled intervention in an industrialising context.*

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