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# Methodological Framework for Evaluating Risk Reduction in Senegalese Transport Maintenance Depot Systems

A Quasi-Experimental Design

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## ABSTRACT

**Background:** Transport maintenance depots are critical infrastructure for ensuring road safety and operational continuity in developing economies. Systematic evaluation of interventions to reduce operational risks within these systems is hindered by a lack of robust, context-specific methodological frameworks.

**Purpose and objectives:** This Data Descriptor presents a methodological framework designed to quantify risk reduction in transport maintenance depot systems. Its primary objective is to provide a structured, quasi-experimental approach for isolating the causal effect of specific engineering and procedural interventions on key risk metrics.

**Keywords:** *quasi-experimental design, risk reduction, transport maintenance, Sub-Saharan Africa, infrastructure evaluation, depot systems, road safety*

### Article Highlights

- Presents a quasi-experimental design to isolate causal effects of depot interventions.
- Dataset includes pre- and post-intervention metrics for 24 Senegalese depots.
- Employs difference-in-differences with cluster-robust standard errors for inference.
- Aims to quantify risk reduction in transport maintenance systems.

### Core Statistical Model

$$Y_{it} = \beta_0 + \beta_1 \text{Treat}_i + \beta_2 \text{Post}_t + \delta (\text{Treat}_i \times \text{Post}_t) + \epsilon_{it}$$
, where  $\delta$  captures the causal treatment effect.

*This paper presents a methodological framework and associated dataset, not empirical results.*

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