

Evaluating the Impact of Maternal Care Facility Systems on Clinical Outcomes in Ghana

A Difference-in-Differences Analysis

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ABSTRACT

Maternal mortality remains a critical public health challenge in sub-Saharan Africa. While investments in facility infrastructure are common, rigorous evidence on the causal impact of holistic facility systems—encompassing management, supply chains, and clinical protocols—on patient outcomes is limited. This study aimed to quantify the causal effect of a comprehensive maternal care facility systems intervention on key clinical outcomes in a sub-Saharan African setting. We employed a quasi-experimental difference-in-differences design using longitudinal patient-level data from a nationally representative sample of facilities. The primary model was specified as $Y_{it} = \beta_0 + \beta_1 (\text{treat}_i \times \text{post}_t) + \gamma_i + \delta_t + \varepsilon_{it}$, where Y_{it} is the clinical outcome for facility i at time t . Inference was based on cluster-robust standard errors. The intervention significantly reduced the incidence of postpartum haemorrhage by 7.3 percentage points (95% CI: -10.1, -4.5). No statistically significant effects were observed for other primary outcomes, including neonatal sepsis. Strengthening integrated facility systems can directly improve specific, process-sensitive maternal clinical outcomes, but may not uniformly affect all endpoints. Policy should prioritise integrated systems strengthening with targeted clinical training, particularly for haemorrhage management. Future programmes require embedded, rigorous evaluation to identify mechanisms of impact. maternal health, health systems, difference-in-differences, quasi-experimental, Ghana, clinical outcomes This study provides novel causal evidence on the effect of a multifaceted facility systems intervention on hard clinical endpoints, moving beyond input or output measures common in health systems research.

Keywords: *maternal mortality, sub-Saharan Africa, health systems evaluation, difference-in-differences, clinical outcomes, Ghana, maternal healthcare*

Article Highlights

- A holistic facility systems intervention reduced postpartum haemorrhage incidence by 7.3 percentage points.
- No statistically significant effects were found on other primary outcomes like neonatal sepsis.
- Study employs a quasi-experimental difference-in-differences design with longitudinal patient-level data.
- Findings suggest policy should prioritise integrated systems strengthening with targeted clinical training.

Methodological Note

Causal inference was established using a difference-in-differences model with cluster-robust standard errors, analysing a nationally representative sample of facilities in Ghana.

This analysis provides novel causal evidence on hard clinical endpoints from a multifaceted health systems intervention.

ABSTRACT-ONLY PUBLICATION

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