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An Evaluation and Cost-effectiveness Analysis of a Collaborative Improvement Intervention for Pre-eclampsia/Eclampsia Care in Mali

The USAID Health Care Improvement (HCI) Project implemented a collaborative improvement intervention to improve the quality of essential obstetric and newborn care (EONC) services, including active management of the third stage of labor and essential newborn care, in two health districts (Diéma and Kayes) in the Kayes Region of Mali from 2010 through 2013. In 2011, HCI started implementing a second improvement intervention aimed at the quality of clinical practice regarding pre-eclampsia and eclampsia (PEE) care.

This evaluation sought to determine the costs and effects of this collaborative improvement intervention and compare them to the costs and effects of a basic clinical training only. The specific research questions were:

- 1) Do pregnant and delivering women in collaborative improvement intervention facilities receive better care (screening/diagnostic and treatment of pre-eclampsia/eclampsia) than those in basic clinical training-only facilities?
- 2) What is the incremental cost-effectiveness of the collaborative improvement intervention compared to the basic clinical training-only intervention, in terms of adherence to pre-eclampsia/eclampsia screening and management standards?

The evaluation used a controlled longitudinal design. Intervention sites were facilities participating in the EONC and pre-eclampsia/eclampsia (PEE) improvement collaborative in Diéma District (seven community health centers and the district referral hospital), and the control sites were facilities in Yélimané District (six community health centers and the district referral hospital). As part of the study, control facilities received basic clinical training on PEE. However, additional trainings were subsequently conducted by the Ministry of Health at some sites.


Due to the March 2012 coup d'état and ensuing suspension of HCI activities in Mali from March to August 2012, modifications were made to the initial evaluation design. As a result, data were collected four times using chart review, and twice (baseline and end line) using observations and self-administered questionnaires between February 2011 and June 2013. In addition, unlike most HCI-supported collaborative improvement activities, the implementation of the intervention included only one learning session and four coaching visits which included but did not focus on PEE.

Data on adherence to PEE screening and management standards were calculated based on chart reviews and observations. Hierarchical regression models with differences-in-differences analyses were used to adjust for clustering of observations by site and baseline differences in terms of adherence to pre-eclampsia/eclampsia screening and management standards. Potential confounders such as woman's age and parity were also controlled for in the regression models. Costs for the intervention were obtained from project records and used as inputs for the decision model, along with the results from the logistic regression analysis.

Regression analyses showed a modest effect of the intervention on adherence to pre-eclampsia screening standards and overall adherence to PEE screening and management standards. On average, the intervention group improved by 0.02 points for adherence to screening and 0.38 points for overall adherence per month ($p < 0.001$). In addition, the intervention group had a 7% higher odds of scoring at least as high as the 75th percentile for overall adherence to PEE standards ($p = 0.035$). The intervention was also associated with 6% higher odds of scoring at least the 75th percentile or above for screening standards. However, this odds ratio was only marginally significant ($p = 0.05$). The differences in scores for screening adherence and overall adherence attributable to the intervention between baseline and end-line are 0.46 and 8.8 points, respectively.

The incremental cost-effectiveness ratios were 524,000 CFA francs per additional patient screened according to standards and 453,000 CFA francs per additional patient managed according to PEE standards.

This controlled evaluation contributes to the much-needed evidence base for the effectiveness of collaborative improvement interventions. While it demonstrated a positive effect of a collaborative improvement intervention on pre-eclampsia and eclampsia care, the result was weaker than expected. This suggests that the investments in this relatively low level of inputs aimed at improving health system performance may not yield acceptably efficient results.

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