

## Multi-tiered quality improvement strategy to reduce maternal and neonatal death in complex delivery systems in Ghana

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## **Abstract**

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Background Referral hospitals see a disproportionate number of maternal and neonatal deaths in low-income settings such in Ghana. In 2013, the maternal mortality ratio in Ghana was 380 per 10 0000 livebirths: in 2015, combined data from three large referral and teaching hospitals showed a rate of 895 maternal deaths per 100 000 livebirths. For these deaths to be reduced, staff capacity needs to be developed to routinely identify problems with service delivery processes, and data-driven approaches will be required. In this study, we describe implementation of a quality improvement programme at Ridge Regional Hospital in Accra, Ghana.

Methods Between 2013 and 2015, Ridge Regional Hospital adopted a quality improvement programme in three stages. In the first stage, two senior staff members were selected to serve as QI (quality improvement) leaders and received 4 days of training in Six Sigma methods. In the second stage, two frontline staff from each of the eight departments in obstetric and neonatology were appointed as clinical champions and received 1 day of training in the running of small improvement projects using Lean principles and the Plan-Do-Study-Act approach. In the third stage, two levels of improvement projects-interdepartmental, led by the QI leaders and departmental, led by the clinical champions—were launched.

Findings Within 6 months of the introduction of the quality improvement programme, two systems projects and two departmental projects to address waiting time for emergency caesarean sections and hand hygiene in the neonatal intensive care unit had begun. The two department-level projects addressed the triage of sick mothers and cleaning and organising the neonatal intensive care unit to reduce errors. There was a four-fold reduction in the percentage of mothers needing emergency caesarean surgery with unacceptable waiting times, over 93% accuracy in identification of the sickest mothers, and a 37% increase in hand hygiene compliance.

Interpretation The multi-level approach taken for quality improvement programmes has had some success in this referral hospital in Ghana. Improvements cannot be achieved without the engagement of all staff across levels, but selected leaders also need the analytical capability to address complex system problems. Each level reinforces the other. The approach at Ridge Regional Hospital is being scaled-up to four other Ghanaian regional hospitals. Furthermore, a learning network is being created to share improvement solutions across the entire system. To engage front line staff in building these capacities, while also increasing capability to address system problems, a multi-tiered approach is needed.

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Declaration of interests

We declare no competing interest.

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