

BMJ Open Quality **How Kabarole Hospital in western Uganda saved mothers' lives through team-based problem-solving**

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To cite: Isabirye P, Abesiga M. How Kabarole Hospital in western Uganda saved mothers' lives through team-based problem-solving. *BMJ Open Quality* 2017;**6**:e000191. doi:10.1136/bmjopen-2017-000191

Received 22 August 2017
Revised 29 September 2017
Accepted 19 October 2017

BACKGROUND

Globally, the maternal mortality ratio (MMR) has declined in recent years, with 99% of maternal deaths occurring in developing countries. Most (75%) maternal deaths are due to severe bleeding, infections, pre-eclampsia and eclampsia, complications of obstructed and prolonged labour, and unsafe abortions.¹ In 2013 in Uganda, the MMR was 360 per 100 000 live births compared with 210 per 100 000 live births globally.^{2 3} Kabarole Hospital, a private, not-for-profit general hospital in Kabarole District, was among the high-volume facilities prioritised by the United States Agency for International Development Applying Science to Strengthen and Improve Systems Project for a maternal, neonatal and child health (MNCH) quality improvement (QI) initiative in four districts of Western Uganda.

OBJECTIVE

The aim of the initiative was to contribute to a reduction of maternal and newborn mortality and morbidity by 50% in four districts of western Uganda including Kabarole Hospital.

METHODS

In May 2013, maternity staff at Kabarole Hospital were trained in QI methods applied to maternal and newborn care. In June 2013, a QI team of 10 members was formed, composed of the head of nursing (responsible for resource allocation), the medical officer assigned to the MNCH Department (provided technical oversight), the head of the MNCH Department (leader of the MNCH QI team), five midwives (provided MNCH services), the records officer (conducted data analysis and reporting), the laboratory technician (conducted laboratory investigations) and the storekeeper responsible for ordering allocation of drugs and supplies. This team started analysing their processes of care using

data summarised from the maternity and antenatal registers and client charts onto a weekly summary sheet developed by the improvement team. The summary sheet contained variables such as number of clients seen per week, number of clients with obstetric complications, management of these complications and the outcome of each obstetric complication. The team recognised it faced a challenge of handling cases with eclampsia, which was among the leading causes of maternal deaths in the hospital. Between January and June 2013, there were six maternal deaths among 682 deliveries (880/100 000 live births), two of which resulted from eclampsia.

A baseline assessment was conducted by the project to ascertain the level of quality of maternal and newborn care services provided. Findings showed blood pressure was not monitored for all women in labour because there was no functional machine, urine dipstick testing was only conducted in the laboratory and only for mothers whose blood pressure was elevated, and hypertensive drugs could not be easily accessed in the labour suite. Hence, the hospital was not well prepared to handle eclamptic cases. The QI team decided to change how care was organised to prevent losing a mother to obstetric complications.

In July 2013, the hospital was invited to send a team to a learning session convened by the project in collaboration with the district health management team, and other implementing partners, with teams from 19 other health units from the four districts. At the meeting, teams learnt how to use QI methods to critically look at how they were providing care for women with eclampsia and other obstetric complications to see what they could change to make care better. The learning session also provided teams the opportunity to learn about changes that other teams had already tried out to improve care of obstetric complications.



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Number of women diagnosed with **high blood pressure in pregnancy** and **maternal deaths**, Kabarole Hospital (average 95 deliveries / month)

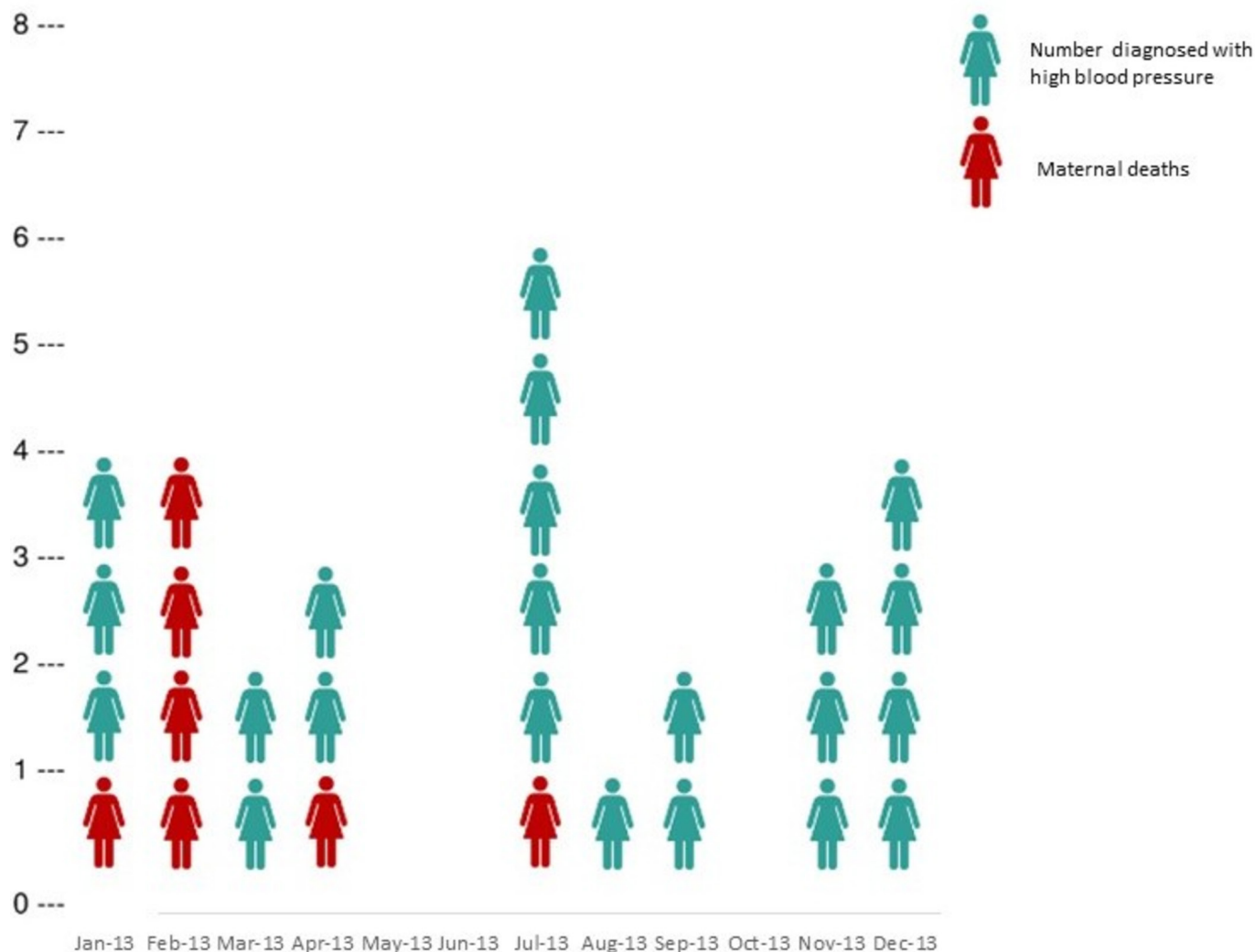


Figure 1 Number of women diagnosed with high blood pressure in pregnancy and maternal deaths among deliveries, Kabarole Hospital (January–December 2013).

After the learning session, the QI team at the hospital decided to try several changes to address eclampsia. In August 2013, they instituted daily review meetings in the maternity department, conducted every morning from 08:00 to 09:00, which were attended by the night shift and day shift midwives, medical officers and representatives of the administration. This meeting provided the whole maternity team the opportunity to discuss what transpired in the last 24 hours on the ward, with a focus on the management of any complicated cases.

By mid-August, the team had identified skill gaps among certain MNCH staff in emergency management and response. The team decided to conduct on-the-job training for the MNCH staff on how to care for a patient with eclamptic fits and on the content and process for eclampsia management, especially

mixing and administering magnesium sulfate per the Uganda Ministry of Health guidelines. In the third week of August, the labour ward received two mothers in a period of 1 week who had eclampsia; both mothers received hands-on care from the trained health workers and were managed successfully.

However, by the end of August, the QI team realised these changes had not completely addressed the hospital's emergency response. Antihypertensive and anticonvulsant drugs were kept in a locked cupboard, managed by the in-charge maternity; hence, these were not accessed by any midwife on duty in case of an emergency. Other supplies like cannulas, catheters, syringes and so on were kept in different places in and outside the labour suite. This caused a delay in handling mothers who presented with eclampsia. The team decided to

make a complete well-labelled eclampsia pack, placed in the emergency area ready to handle eclamptic cases. The plan was to replenish the pack as soon as it is used up by the midwife who handled the eclamptic case.

By early September 2013, the hospital had seen improvements in how obstetric complication cases were being managed, but the QI team found that meetings to discuss their data were not being attended by medical officers and some midwives. In addition, a few midwives were not replenishing the eclampsia packs as had been agreed on. This was affecting the morale of other team members. The QI team decided that there was a need to engage the facility administration in QI activities. The team met with the hospital administrator to orient her on the value of the QI work and brief her on which changes the team was working on to address the existing challenges. She was fully supportive and passed a notice to all maternity staff including medical officers to always attend the morning ward meetings as part of their duties. The hospital administrator also regularly attended in person. The team consequently saw attendance of QI team meetings by all maternity staff, including medical officers, timely reporting of all staff on duty and handling of complications as a team.

RESULTS

Between January and June 2013, the hospital conducted 682 deliveries and experienced six maternal deaths (institutional MMR of 880/100 000 deliveries) with seven mothers (7/682 deliveries) diagnosed with high blood pressure in pregnancy (1%). During the following 6 months, as they increased diagnosis and treatment of high blood pressure among pregnant women to 3.3% (15/460 deliveries), they reduced the number of maternal deaths occurring at their health facility by 75% to one (institutional MMR of 217/100 000 live births) (figure 1). Similarly, the number of predischARGE newborn deaths (0–7 days) decreased by 44% from 11 (18/1000 live births) between January and June 2013 to 4 newborn deaths (10/1000 live births) from July to December 2013.

CONCLUSION

The experience at Kabarole Hospital shows that institutional maternal and newborn deaths can be reduced if QI teams use their data to critically identify specific causes of deaths and apply improvement methods to

identify and address process gaps. Engaging leaders in improvement work is critical for institutionalisation. One challenge faced was the high staff attrition, hence the need to continuously train new staff in QI skills and adherence to standards through simulation sessions in the skills laboratory. Morning review meetings have been institutionalised in all hospital departments building on lessons learnt from the maternity department. Since the completion of the project's work, the hospital administration has included QI initiatives into the hospital work plans and budgets. One limitation of this study was the lack of a blinded outcome assessment, which may have caused expectancy effects.

Acknowledgements The authors acknowledge the Kabarole District Health Office and Kabarole Hospital Staff especially the MNCH quality improvement team of the hospital.

Contributors PI planned and supported implementation of this work (guarantor). MA led the implementation of this work (guarantor). Silvia Holschneider submitted the study.

Funding The intervention described in this paper was part of the Saving Mothers Giving Life initiative made possible by the support of the American people through the US President's Emergency Plan for AIDS Relief (PEPFAR) and the United States Agency for International Development (USAID) through its Applying Science to Strengthen and Improve Systems (ASSIST) Project, implemented by University Research Co., LLC under Cooperative Agreement Number AID-OAA-A-12-00101.

Disclaimer The contents of this study are the sole responsibility of University Research Co., LLC and do not necessarily reflect the views of the United States Agency for International Development or the United States Government.

Competing interests None declared.

Ethics approval This work was implemented through the study protocol of the Saving Mothers Giving Life initiative that was submitted and approved by the Institutional Review Board (IRB) of Makerere University, Kampala, Uganda.

Provenance and peer review Not commissioned; externally peer reviewed.

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