

Improving Post-Delivery Complications and Quality of Birth Practice in District Hospitals in Rwanda

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INTRODUCTION

Reducing maternal mortality is a major focus worldwide. It was estimated that about 830 maternal deaths occurred every day around the globe in 2015, roughly 303 000 per year; 95% of the deaths have occurred in low-income countries and over 60% in Sub Saharan Africa [1].

Globally, 75% of maternal deaths are caused by the following 5 complications: hemorrhage, infections, preeclampsia and eclampsia, obstructed labor, and abortions [1]. This is similar to the situation of Rwanda where these 5 common causes of maternal mortality in Rwanda have remained the same for the last 6 years. In 2016, Postpartum hemorrhage (PPH) and sepsis accounted for 46% of maternal deaths in Rwanda; more than 70% of deaths occurred in teaching and district hospitals, and 64% of deaths occurred during the postpartum period [2]. Rwanda has achieved the Millennium Development Goal (MDG) 5 by decreasing the maternal mortality rate (MMR) dramatically from 1071 in 2000 to 210 per 100,000 live births in 2015 [3,4]. However, this is still unacceptably high in comparison to the MMR in high-income countries

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Received: August 21, 2020

Accepted: September 05, 2020

Published: September 30, 2020

Cite this article as: Tuyishime et al. Improving Post-Delivery Complications and Quality of Birth Practice in District Hospitals in Rwanda. *Rw. Public Health Bul.* 2020. 2 (3): 26-29.

like the United Kingdom (UK), whose MMR is 3.49 per 100,000 [5].

There is evidence that most deaths in tertiary hospitals are associated with problems that began in district hospitals. In fact, in 2015, 96% of maternal deaths and near-misses at the main teaching hospital in Kigali (CHUK) occurred after a transfer from DHs and were mostly due to infections (32%) and PPH (20%); and most of these complications are direct obstetric complications [2].

These figures call for effective interventions to improve the safety of deliveries in district hospitals in Rwanda. Indeed, a study done in the United States (US) found that maternal deaths caused by PPH and infections are highly preventable through training and the use of guidelines to screen for risk factors and to manage complications early (by 93% and 43% respectively) [6].

PROBLEM

The following gaps need to be addressed to improve the quality of maternal care in DHs and decrease mortality among women referred from DHs:

1. Safety of cesarean section (CS): In our findings, approximately 80% of complications occurred following a cesarean section with a mortality of 18%. An improvement in the safety of CS at DHs may decrease considerably the maternal mortality rate.
2. Management of common complications following deliveries (Post CS peritonitis, PPH, and preeclampsia and eclampsia): In our findings, more than 90% of complications occurred following these 3 complications. Improvement in the prevention and timely management of these

3 complications may decrease considerably the maternal mortality rate.

3. Use of guidelines and protocols: Use of guidelines and protocols have shown to decrease mortality considerably in other settings [6]. Adapting this intervention for DHs has the potential to improve the maternal mortality rate.

Evaluation framework

To decrease the maternal mortality in DHs, effective, feasible, low cost, and sustainable interventions are needed. An appropriate intervention should meet the following criteria:

1. Effectiveness: The intervention has shown to be effective in other settings
2. Cost: The intervention is low cost
3. Sustainability: The intervention can be run by DHs with minimal support after the implementation

POLICY ALTERNATIVES

This memo will explore the following policy options in our recommendations to the Ministry of Health to improve the quality of maternal care and decrease maternal mortality in district hospitals in Rwanda.

LONG TERM

Obstetric Surgical Skills and Emergencies (OSSE) short course for non-specialists [GPs, Non-Physician Anesthetists (NPAs)], and Recovery or Operating Room Nurses

The OSSE course will focus on common complications in each hospital.

An initial 5-days training of trainers (15 in each hospital including 5 GPs, 5 NPAs, 5 Nurses) followed by 2 days mentorship to provide course materials and to observe the new trainers one-day teaching. At the end of the mentorship, the team will initiate the implementation of pre-printed guidelines for common complications in every patient file; this has the potential to improve their compliance with taught best practices and to improve the quality of care.

This intervention has been shown to be effective, it is low cost as there is already a budget for capacity building, and it is sustainable as most of the trained staff will stay in DHs and will train this course to

new staff as needed. The trainers will come from 3 professional associations (Rwanda Society of Obstetrics and Gynecology, the Rwanda Society of Anesthesiologists, and the Rwanda Nursing and Midwives Union).

By using technology, the duration of the courses will be decreased to one day of hands-on practice while other contents will be completed online (See attached Appendix 1 of the list of available courses). As long as the staff is motivated, multiple free online courses exist like Help Mother Survive <https://hms.jhpiego.org/training-materials/> and SAFE obstetric course <http://www.e-safe-anaesthesia.org/>, just to name few.

The program evaluation may use validated standards of care tools including participants' Non-technical Skills (NOTSS) and obstetric surgical skills checklists (examples: cervical tear, 4th-degree perineal tear) as described by Touch Surgery team. Details about NOTSS and Touch Surgery can be found here (<https://www.rcsed.ac.uk/professional-support-development-resources/learning-resources/non-technical-skills-for-surgeons-notss/notss-for-trainees> and Obstetric Simulation-based Course (Touch surgery): <https://www.touchsurgery.com/simulations/cesarean-section>

For this program to be successful, there is a need for strong local ownership at the hospital level through the establishment of dedicated education and patient safety team which will conduct courses at least one day per week with remote support from experienced trainers from the 3 professional associations.

The hospitals and healthcare providers will need to make the commitment for these courses to be taken seriously; in our previous experience, some course participants were motivated by the per diem and were not reading course materials at home. Also, some hospitals organize courses to check the box during the accreditation period only.

Use of guidelines as posters and pre-printed orders

Currently, the guidelines exist in the format of big books which are not easy to use. These guidelines should be operationalized to be user-friendly and completed within the patient charts. A study done in 2017 at Masaka District Hospital by Tuyishime

and colleagues, for example, found the compliance to the WHO Safe Childbirth Checklists of 56% after training.

In addition, our preliminary data on the implementation of the Modified Early Obstetric Warning Signs (MEOWS) in 4 district hospitals found a compliance rate of 75%; length of forms, low staff/patients' ratio, language barrier (English), low number of trained staff, and lack of printed forms were factors reported by staff as reasons of not filling the forms.

The use of guidelines should be aligned with accreditation requirements and patient safety initiatives as proposed by the Association for Patient Safety Movement as an example (<https://patientsafetymovement.org/actionable-solutions/actionable-patient-safety-solutions-apss/>). In

order to implement these guidelines, a dedicated team of 2 committed providers can be trained in operation research with the mentorship from the 3 professional associations. An example of the operation research can be accessed on the following link: (<https://www.youtube.com/channel/UC9ZRuVhbrxJm5xAjUHwo6Hw>).

LONG TERM

Obstetric Surgical Skills and Emergencies (OSSE) fellowship for non-specialists [GPs, Non-Physician Anesthetists, and Recovery or Operating Room Nurses]

As CS and other obstetrics surgical skills (perineal repair, cervical repair, etc) are currently performed by non-specialists, we recommend to arrange a specific training in form of a one-year fellowship or shorter OSSE course for leaders in obstetrics at DHs (for 2 GPs, 2 Non-Physician Anesthetists, and 2 Recovery or Operating Room Nurse) in collaboration with the Teaching Hospitals and the University of Rwanda.

This training may include online didactic teaching, rotation at referral hospitals, and mentorship by specialists once back at DHs. This model is feasible as it is being implemented by the College of Surgeons of East, Central and Southern Africa (COSECSA) surgery fellowship programs (<http://www.cosecsa.org/fcs>). This model would also benefit the hospitals as it would allow students to stay in their current clinical roles while improving their academic capacity.

This effective intervention may be expensive at the beginning but has the potential to be sustainable

and low cost in the long run as trained personnel will stay at the DHs to train other staff (GPs, Non-Physician Anesthetists, and Recovery or Operating Room Nurses). Finally, there will be an improvement in the safety of childbirth at DHs due to the input of these trained staff.

In addition, Rwanda needs to increase the number of obstetricians from less than 100 now to 960 by 2030 to achieve the Lancet Commission on Global Surgery (LCoGS) target of 20/100,000 Surgeons Obstetricians Anesthesiologists, however, this is not feasible with the current teaching capacity of about 10 graduates each year, the Obstetric Surgical Skills and Emergencies fellowship for non-specialists seems to be a feasible and cost-effective alternative.

Obstetric Surgical Skills and Emergencies (OSSE) certification program for non-specialists [GPs, Non-Physician Anesthetists, and Recovery or Operating Room Nurses]

This program will ensure that any non-specialist meet certain competencies as demonstrated during a written exam and skills exam during a simulated environment. The exam may be done annually or sooner if the non-specialist shows signs of poor performance causing poor patient outcomes.

The hospitals would have to support all concerned professionals (GPs, Non-Physician Anesthetists, and Recovery or Operating Room Nurses) to prepare adequately those exams with teaching materials (mainly online) and hands-on practice through the support of the 3 Professional bodies and local education and patient safety teams.

Recommendation

Given that the 4 options proposed have a potential to impact considerably the quality of maternal care and to decrease maternal mortality in district hospitals in Rwanda, we recommend to start with the implementation of the 2 short-term alternatives respectively the Obstetrics Surgical Skills and Emergencies short course and use of guidelines as they need less budget and planning. Then, for sustainability, the 2 long-term alternatives, the Obstetrics Surgical Skills, and Emergencies fellowship and certification programs for non-specialists should be implemented after consulting all concerned stakeholders and developing a detailed plan.

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Appendix: Examples of available courses online

Courses	Website
ACLS/PALS/BLS, First Aid, and Blood Borne Pathogens courses	https://nhcps.com/
Obstetric Simulation-based Course (Touch surgery)	https://www.touchesurgery.com/simulations/cesarean-section
SAFE obstetric course	http://www.e-safe-anaesthesia.org/
Help Baby Breathe	https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/helping-babies-survive/Pages/Course-Materials.aspx
Help Mother Survive	https://hms.jhpigo.org/training-materials/
Non-Technical Skills for Surgeons (NOTSS)	https://www.rcsed.ac.uk/professional-support-development-resources/learning-resources/non-technical-skills-for-surgeons-notss/notss-for-trainees
WFSA tutorial of the week	https://www.wfsahq.org/resources/anaesthesia-tutorial-of-the-week
Operation research course	http://origin.theunion.org/what-we-do/courses/online-and-multimedia-training/sort-it