Rapid Response Brief

Date: March 2026

Options for controlling adverse outcomes of pre-eclampsia in lower health facilities before and during transfer to higher facilities for care.

Key messages

High-quality obstetric care by lower health facilities remains critical in reducing the adverse maternal and neonatal outcomes due to Pre-Eclampsia, before and during referral to higher-level facilities.

To effectively reduce adverse events associated with pre-eclampsia at lower-level health facilities, involving a combination of various targeted interventions is essential. These interventions may include:

Behavioral change interventions

1. Clinical audits combined with feedback, target-setting sessions with health care workers, refresher training, and displaying reminders.
2. Point of care reminders combined with refresher training, audit, and feedback.
3. Routine health facility educational visits combined with audit and feedback.
4. Regular team-based simulation trainings alongside onsite mentorship, on-the-job supervision, and job aids.

Clinical Interventions

1. Maintaining well-stocked PE emergency trays or trolleys together with audit and feedback, refresher training, and the use of checklists.

2. Use of the checklist and ultrasound scan, together with training of midwives and the provision of mobile airtime to support referral communication.

Technological interventions

1. Use of a Mobile Health application to facilitate data collection and decision making for high-risk cases, combined with training in the use of the app and refresher training on the management of PE, job aids, and educating pregnant women about the need for referral.

2. Use of a WhatsApp-based referral communication platform alongside referral notes and triage training to allow for improved preparation for incoming patients, reduced delays upon arrival, and feedback between health care providers

Strengthening antenatal care, providing health education for mothers and their communities about the danger signs of preeclampsia, and ensuring consistent availability of skilled human resource, essential drugs, supplies, commodities, and equipment for the management of PE are essential to ensure timely access and management of PE.

Where did this Rapid Response come from?

This document was created in response to a specific question from a policy maker in Uganda in 2026.
It was prepared by the Center for Rapid Evidence Synthesis (ACRES), at the Uganda country node of the Regional East African Community Health (REACH) Policy Initiative

✚ Included:

- **Key findings** from research
- **Considerations about the relevance** of this research for health system decisions in Uganda

✗ Not included:

- Recommendations
- Detailed descriptions

ACRES THE CENTER FOR RAPID EVIDENCE SYNTHESIS

MAKERERE UNIVERSITY COLLEGE OF HEALTH SCIENCES

UNHRO

JUMUIYA YA AFRIKA MASHARIKI

REACH Regional East African Community Health Policy Initiative

Short summary

Background: Pre-eclampsia (PE) is a life-threatening pregnancy complication and is the second leading cause of maternal deaths in Uganda. Mukono District's Emergency Care team has observed that approximately 80% of maternal deaths are due to pre-eclampsia (PE) occurring before and during referrals to higher-level health facilities. While there have been efforts, such as training for its healthcare workers on the use of magnesium sulphate (MgSO4) and providing access to MgSO4, healthcare workers at Health Centre III are not administering the drug due to fear of side effects and risk of toxicity from MgSO4. Consequently, referrals to higher-level facilities are initiated without administering MgSO4. The District Health Team seeks to identify interventions that can be implemented at lower health facilities to address the challenge of pre-eclampsia before and during referral to higher-level health facilities.

Rapid Response question: *What are the options for controlling adverse outcomes of pre-eclampsia in lower health facilities before and during transfer to higher facilities for care.*

Findings: The evidence indicates that improving PE management necessitates a combination of interventions for better outcomes. Despite this, the impacts on maternal and neonatal outcomes remain underexplored.

Summary of the interventions effective in improving the management of PE at lower health facilities before and during transfer to higher-level facilities for care.

Behavioral change interventions

1. Clinical audits combined with feedback, target-setting sessions with health care workers, refresher training, and displaying reminders
2. Point of care reminders combined with refresher training, audit, and feedback.
3. Routine health facility educational visits combined with audit and feedback.
4. Regular team-based simulation trainings alongside onsite mentorship, on-the-job supervision, job aids, and consistent availability of essential drugs, supplies, commodities, and equipment for the management of PE.

Clinical Interventions

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2. Use of a WhatsApp-based referral communication platform alongside referral notes and triage training to allow for improved preparation for incoming patients, reduced delays upon arrival, and feedback between health care workers.

Conclusion

To effectively reduce adverse events associated with pre-eclampsia at lower-level health facilities, both before and during transfers to higher-level facilities, it is essential to implement more than just single interventions. Most standalone interventions tend to produce only small to moderate effects. Therefore, a combination of approaches that focus on changing health worker behavior and ensuring prompt and appropriate care for pre-eclampsia patients may significantly enhance maternal and neonatal outcomes.

How this Rapid Response was prepared

After clarifying the question being asked, we searched for systematic reviews, local or national evidence from Uganda, and other relevant research. The methods used by the SURE Rapid Response Service to find, select and assess research evidence are described here: www.evipnet.org/sure/rr/methods

Background

In Uganda, Pre-eclampsia (PE) is the second leading cause of maternal mortality at 15% [1]. Pre-eclampsia is a life-threatening pregnancy complication presenting commonly as persistent high blood pressure in pregnancy. Pre-eclampsia in severe cases is associated with an increased risk of maternal seizures, organ failure, placental abruption, and stroke, and to the unborn child, there is an increased risk of pre-term birth and stillbirths, among others [1]. In Uganda, lower-level health centres, such as Health Centre III (HCIII), are the first point of contact for many pregnant mothers. These facilities are responsible for identifying those at risk of developing PE, close blood pressure monitoring with anti-hypertensive therapy, and stabilizing the mother with Magnesium Sulphate (MgSO4) before referral to higher-level facilities [2]. Despite this, a recent evaluation of emergency care for severe pre-eclampsia in Uganda noted a number of factors consistently associated with not providing optimal care for PE patients. These included a lack of staff training, a lack of readily available clinical protocols, a lack of antenatal education, and a lack of close monitoring and respectful care for pregnant mothers [3]. However, providing solutions to these challenges remains constrained, mainly due to a lack of resources.

In Mukono district, the District Health Team (DHT) has noted an increase in the number of deaths due to PE during referral from HCIII to higher-level facilities. As observed by the Emergency Care team at the district, about 80% of maternal deaths are due to PE. The DHT, together with other implementing partners, has conducted training for its healthcare workers on the use of MgSO4 and provided access to MgSO4 for the management of PE before and during referral. Despite these efforts, healthcare workers at HCIII are not administering the drug due to fear of side effects and risk of toxicity of MgSO4, associated with issues such as cardiac arrest. Consequently, referrals to higher-level facilities are initiated without administering MgSO4. This has increased the risk of preventable maternal and fetal mortality due to preeclampsia in the district. The District Health Team, therefore, seeks to identify interventions that can be implemented at lower-level health facilities to address the challenge of pre-eclampsia before and during referral to higher-level facilities. The evidence is intended to inform decision-making discussions between the District Health Team and the Implementing Partners in Mukono district.

Rapid Response question: *What are the options for controlling adverse outcomes of pre-eclampsia in lower health facilities before and during transfer to higher facilities for care?*

Summary of findings

The evidence indicates that improving PE management necessitates a combination of interventions for better outcomes. The evidence has been summarized from systematic reviews, randomized controlled trials, feasibility studies, and implementation and evaluation studies in low-resource settings. Despite this, the impacts on maternal and neonatal outcomes remain underexplored.

This rapid response brief summarizes options for controlling adverse outcomes of pre-eclampsia in lower health facilities before and during transfer to higher facilities for care, while highlighting their effectiveness when implemented alone versus when combined with other strategies.

Options for controlling adverse outcomes of pre-eclampsia in lower health facilities before and during transfer to higher facilities for care

Behaviour Change Interventions	Description	Effectiveness alone	Effectiveness when combined with other strategies
Clinical audits and feedback	This involves the use of audit tools, including criterion-based clinical audits and maternal death reviews conducted routinely, while providing feedback to health care workers to improve the quality of PE care at the health facilities.	Audit and feedback alone generally achieve small-to-moderate (about 6-10%) improvements in adherence to clinical protocols [4].	Clinical audits combined with feedback, target-setting sessions with health care workers, refresher training, and displaying reminders appear to be more effective in improving the management of PE cases [5]. Greater effects may be achieved when feedback is given by a colleague or supervisor, baseline performance is low, when conducted regularly, and when delivered in both verbal and written formats [4]. Effects of individualised versus team-based feedback remain mixed. It is crucial to provide feedback in a non-blaming and supportive way
Point-of-care reminders	This involves designing simple action alerts or reminders for healthcare workers to perform immediate actions during the management of PE. Reminders can be paper-based, such as highlighted or colour-coded visuals or a one-page description of the treatment algorithm. To ensure easy access, these can be placed in patient files, on nurse assessment forms, on the Ward walls, or at the patient's bedside, emergency/ triage, and nurse stations.	A 2019 Cochrane review reported that Paper-based reminders alone produce small to moderate improvements (8.45%) in adherence to protocols, including medication administration and vital signs checks, compared with usual care (without reminders) [6].	Paper-based reminders may be more effective for simple actions, such as administering drugs, than for complex multi-step actions [6]. When combined with other interventions such as training, audit and feedback, reminders could slightly improve compliance with clinical recommendations (by more than 10%). However, there may be little or no difference in patient outcomes compared with reminders alone [6].

Routine health facility educational visits	This involves the use of a health-facility-based trained person who meets with health care workers at health facilities to provide information, including encouraging adherence to protocols, emphasizing understanding the benefits of life-saving drugs and the effects of PE to the mother and unborn child, as well as providing feedback on the performance of providers.	Educational health facility visits produce about 6-15% improvements in compliance with the clinical practice, including prescribing medications and providing screening tests [7].	Effects tend to be greater if combined with audit and feedback, when baseline performance is low, and when multiple visits are conducted [7].
Regular team-based simulation trainings and onsite mentorship.	Training health care workers in basic Emergency Obstetric Care using approaches such as simulation-based (Low-Dose, High-Frequency) training, which emphasize short, repetitive, and realistic team-based drills at the health facility, to improve assessment, monitoring, and management of severe PE cases.	Short (1-5 days) Simulation-based or skills and drills programs appear to be more effective at improving health care workers' knowledge (10.6%) and skills (29.8%) for the management of pre-eclampsia. Training has also shown a significant improvement in adherence to protocols, confidence, complications documentation, communication, and teamwork, and improved neonatal outcomes [8]. Although still limited, emerging evidence suggests that training in emergency obstetric care can potentially improve maternal and neonatal health outcomes.	Continuing medical education alongside on-the-job supervision and on-site mentorship may achieve greater sustained improvements in [9]. In Bangladesh, providing a two-day competency training, job aids, eclampsia kits with pre-loaded MgSO4, blood pressure machines, and onsite mentorship and supervision resulted in about 54% of PE patients managed according to the protocol and about 75% referral compliance [9].
Clinical interventions			
Use of a triage checklist alongside a foetal ultrasound scan	The use of triage checklists prompts providers to perform clinical assessment and guide referrals, while the ultrasound scan assesses the foetus to inform referrals if the foetus is abnormal.	The checklist alone is likely to improve correct diagnosis, including danger signs, with small improvements in referrals (8.6%)	In a pre-post study in Eastern Uganda, the use of the checklist and ultrasound scan, together with training of midwives and the provision of mobile airtime to support communication between referrals, improved correct diagnoses for pregnancy complications and increased referrals from 8.6% to 48.4% in one year [10].

Maintain well-stocked PE emergency trays or trolleys	Have a dedicated tray of all essentials for the management of PE. This can include oral antihypertensives, MgSO4, needles and syringes, calcium gluconate, blood pressure machines, and instructions for the correct dose and administration. These can be placed in the labour or maternity wards, with periodic restocking of supplies.	The presence of a well-stocked emergency trolley alone may not achieve measurable improvements in providing correct emergency care for PE [3].	Greater improvements may be realized by incorporating audit and feedback, refresher training, and the use of checklists [9].
Use of simplified standardized protocols	This includes providing simplified visual job-aid instructions, flowcharts, and checklists available at all points of care for PE patients. This is intended to reduce medical errors and deviations from the established treatment protocols.	Compared with no intervention, printed educational materials, including job aids, may produce small (4%) improvements in healthcare worker practice such as prescribing/treatment, referrals, record keeping etc, with little to no difference to patient health [11]. In Uganda, health facilities where clinical protocols were easily accessed were about 3.9 times more likely to provide correct emergency care for pre-eclampsia compared to their counterparts [3].	Providing simplified job aids alongside continuing medical education, mentorship, supervision, audit, and feedback can be more effective in influencing health worker adherence to guidelines [12].
Technological interventions			
Use of a Mobile Health application to identify high-risk cases for referral.	This application can include checklists for entering patient information, such as blood pressure, and warning alerts for high-risk cases. Based on the results, the mobile app can recommend appropriate medication and referrals to a higher-level health facility. Examples of digital health interventions feasible in resource-limited settings include the CRADLE VSA traffic light early warning system and the	Mobile phone applications have the potential to facilitate data collection and decision making, with some demonstrating improvements in maternal and neonatal outcomes [13]. However, their scale-up and integration into existing health information systems remain a challenge.	In Nigeria, the use of a mobile health application combined with training in the use of the app and refresher training focusing on accurate measurement of blood pressure; identifying the warning signs and symptoms of pre-eclampsia, with job aids; provision of validated blood pressure measurement machines; administration of antihypertensives and pregnant women education about the need for referral, resulted in

	PIERS on the Move (POM) App and Bliss4Midwives(B4m)		about 49.3% of loading doses of MgSO4 given safely with no adverse events [14] . However, there was no significant impact on maternal and neonatal mortality and morbidity.
Use of a WhatsApp-based referral communication platform	This includes a mobile-based WhatsApp template sent to the receiving health facility, including the patient's condition, medical history, interventions given, and planned transportation method.		In a pre-post study in Liberia, the mobile-obstetric referral emergency system based on a WhatsApp template, in addition to triage training, allowed for improved preparation for incoming patients, reduced delays upon arrival, and feedback between health care providers. Mothers were more likely to undergo caesarean section (86%), with improvements in newborn health (69%). However, there was no significant difference in the time taken to reach the higher-level facility [15]. Other studies indicate that mobile phone interventions, in addition to referral notes, were found to improve obstetric emergency referrals[16].

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Summary of effective interventions for improving the management of PE at lower health facilities before and during transfer to higher-level facilities for care.

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Other considerations

1. Strengthening the quality of antenatal care to actively identify and follow up mothers who have pre-eclampsia or are at risk, as early diagnosis and treatment of pre-eclampsia is key to preventing its progression to eclampsia and related adverse outcomes.

2. Empower women and their communities through health education about the danger signs of Pre-eclampsia, such as severe, persistent headache, visual disturbances, and epigastric pain, etc, and the importance of improving adherence, the importance of regular antenatal visits, and identification of danger signs.

3. Strengthening the role of community extension workers in the identification of women at risk, through outreach and home visits to encourage and educate mothers on the danger signs and adherence to ANC attendance.

4. Maintaining a consistent availability of skilled human resource, essential drugs, supplies, commodities, and equipment for the management of PE.

Conclusion

To effectively reduce adverse events associated with pre-eclampsia at lower-level health facilities, both before and during transfers to higher-level facilities, it is essential to implement more than just single interventions. Most standalone interventions tend to produce only small to moderate effects. Therefore, a combination of approaches that focus on changing health worker behavior and ensuring prompt and appropriate care for pre-eclampsia patients may significantly enhance maternal and neonatal outcomes.

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What is Rapid Response?

Rapid Responses address the needs of policymakers and managers for research evidence that has been appraised and contextualised in a matter of hours or days, if it is going to be of value to them. The Responses address questions about arrangements for organising, financing and governing health systems, and strategies for implementing changes.

ACRES – The Center for Rapid Evidence Synthesis (ACRES) is a center of excellence at Makerere University- in delivering timely evidence, building capacity and improving the understanding the effective, efficient and sustainable use of the rapid evidence syntheses for policy making in Africa. ACRES builds on and supports the Evidence-Informed Policy Network **(EVIPNet) in** Africa and the Regional East African Community Health **(REACH)** Policy Initiative (see back page). ACRES is funded by the Hewlett and Flora foundation.
http://bit.do/eNQG6

ACRES' collaborators:

Regional East African Community Health Policy Initiative

EVIPnet

Glossary

of terms used in this report:
www.evipnet.org/sure/rr/glossary

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This summary was prepared by;
Caroline Nakalema, Peter Kasadha, Sherry Rita Ahirirwe, Kayongo Edward, Pastan Lusiba, and Ismael Kawooya, The Center for Rapid Evidence Synthesis (CRES), Plot 24 Wampewo Close, Kololo, Kampala, P.O Box 20026, Kampala, Uganda

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1. Dr. Jackline Akello, Assistant Lecturer, Department of Obstetrics and Gynaecology, School of Medicine, Makerere University, Kampala, Uganda.

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For more information contact

Name: Caroline Nakalema
Email address: cnakalema@acres.or.ug