August 2016 – SUPPORT Summary of a systematic review

Do emergency obstetric referral interventions reduce maternal and neonatal mortalities in low- and middle-income countries?

Ensuring access to healthcare by pregnant women is a challenge in low- and middle-income countries. Even if access is possible, a lack of adequate personnel or equipment may mean that complications cannot be treated when they arise. Emergency referral interventions have been advocated to reduce both maternal and neonatal mortality.

Key messages

- **Emergency referral interventions may lead to a reduction in maternal mortality.**
- **Emergency referrals probably lead to a reduction in neonatal mortality.**
- **The effect of emergency referral interventions on stillbirths is uncertain.**
- **None of the included studies reported cost outcomes; the cost implications of emergency referral interventions are therefore uncertain.**
- **The included studies were conducted in low- and middle-income countries and are likely applicable to other low-income country settings**

Who is this summary for?

People making decisions about emergency obstetric referral interventions.

This summary includes:

- **Key findings** from research based on a systematic review
- **Considerations about the relevance of this research** for low-income countries

Not included:

- Recommendations
- Additional evidence not included in the systematic review
- Detailed descriptions of interventions or their implementation

This summary is based on the following systematic review:

Hussein J, Kanguru L, Astin M, Munjanja S. The Effectiveness of Emergency Obstetric Referral Interventions in Developing Country Settings: a Systematic Review. PLoS Med 2012; 9(7): e1001264.

What is a systematic review?

A summary of studies addressing a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise the relevant research, and to collect and analyse data from the included studies

SUPPORT was an international project to support the use of policy relevant reviews and trials to inform decisions about maternal and child health in low- and middle-income countries, funded by the European Commission (FP6) and the Canadian Institutes of Health Research.

Glossary of terms used in this report: www.supportsummaries.org/glossary-of-terms

Background references on this topic: See back page

Background

Complications in pregnancy and during childbirth can easily deteriorate, resulting in the death of the mother or the newborn. Some complications can be managed well at health facilities that have the required personnel and equipment. But when complications occur at facilities where they cannot be managed, a referral should be done as soon as practically possible. Interventions to improve referrals are usually complex but can generally be classified as *organisational* (those involved, for example, in surmounting obstacles to emergency transport, particularly cost) and *structural* (the purchasing of equipment, such as motorcycles/ambulances or communication equipment, or the building, for instance, of maternity homes).

How this summary was prepared

After searching widely for systematic reviews that can help inform decisions about health systems, we have selected ones that provide information that is relevant to low-income countries. The methods used to assess the reliability of the review and to make judgements about its relevance are described here: www.supportsummaries.org/how-support-summaries-are-prepared/

Knowing what's not known is important

A reliable review might not find any studies from low-income countries or might not find any well-designed studies. Although that is disappointing, it is important to know what is not known as well as what is known.

A lack of evidence does not mean a lack of effects. It means the effects are uncertain. When there is a lack of evidence, consideration should be given to monitoring and evaluating the effects of the intervention, if it is used.

About the systematic review underlying this summary

Review objective: To assess the effects of referral interventions that enable pregnant women to reach health facilities during an emergency after the decision to refer has been made

	What the review authors searched for	What the review authors found
Study designs and interventions	Any randomized trial or quasi-experimental studies looking at phase II (delays in reaching an appropriate facility) interventions to improve referral of emergency obstetric conditions	19 studies: cluster randomized trials (4), before-after studies (9), and observational cohort studies (6) 14 interventions: organisational interventions (6 studies), structural interventions (7), mixed interventions (structural and organisational) (1)
Participants	Pregnant and postpartum women with an obstetric complication	Pregnant women and postpartum women with obstetric complications
Settings	Low- and middle-income countries	Rural settings in low- and middle-income countries: Bangladesh (6 studies), Zimbabwe (4), Guatemala (1), Pakistan (1), India (1), Nepal (1), Indonesia (1), Zambia (1), Malawi (1), Burkina Faso (2)
Outcomes	Maternal and neonatal mortality and stillbirths	Maternal mortality (7 studies), neonatal mortality (6), and stillbirths (7). 1 study reported on both neonatal and stillbirths.
Date of most recent search: November 2010		
Limitations: This is a well-conducted systematic review with only minor limitations		

Hussein J, Kanguru L, Astin M, Munjanja S. The Effectiveness of Emergency Obstetric Referral Interventions in Developing Country Settings: a Systematic Review. PLoS Med 2012; 9(7): e1001264.

Summary of findings

The review identified 19 studies: Seven studies described six complex organisational interventions, nine studies described seven complex structural inteventions and three studies described a mix of the two types of interventions. All the studies were conducted in low-income countries.

1) Organisational interventions

These interventions were complex and included: financing and incentive schemes, integration between different health providers, education, and raising awareness of the complications of pregnancy and childbirth.

- ➔ **Organisational interventions may lead to little or no difference in maternal mortality. The certainty of this evidence is low.**
- ➔ **Organisational interventions probably reduce neonatal mortality. The certainty of this evidence is moderate.**
- ➔ **The effect of organisational interventions on the number of stillbirths is uncertain because the certainty of this evidence is very low.**
- ➔ **None of the included studies assessed the cost implications of these interventions.**

About the certainty of the evidence (GRADE) *

⊕⊕⊕⊕
High: This research provides a very good indication of the likely effect. The likelihood that the effect will be substantially different† is low.

⊕⊕⊕◯
Moderate: This research provides a good indication of the likely effect. The likelihood that the effect will be substantially different† is moderate.

⊕⊕◯◯
Low: This research provides some indication of the likely effect. However, the likelihood that it will be substantially different† is high.

⊕◯◯◯
Very low: This research does not provide a reliable indication of the likely effect. The likelihood that the effect will be substantially different† is very high.

* This is sometimes referred to as 'quality of evidence' or 'confidence in the estimate'.

† Substantially different = a large enough difference that it might affect a decision

See last page for more information.

Organisational interventions during referral compared to no intervention

People Pregnant women and postpartum women
Settings Rural areas in low-income countries
Intervention Organisational
Comparison Standard care

Outcomes	**Impact**	Number of studies	Certainty of the evidence (GRADE)
Maternal mortality	Organisational interventions may not have substantial effects on maternal mortality levels in the long-term (5 or more years), but in the short-term may lead to a reduction in maternal mortality.	3 studies	⊕⊕◯◯ Low
Neonatal mortality	Organisational interventions probably reduce neonatal deaths. One study in India reported an average reduction in neonatal mortality of 52%	4 studies	⊕⊕⊕◯ Moderate
Stillbirths	It is uncertain whether organisational interventions lead to a reduction in the number of stillbirths.	4 studies	⊕◯◯◯ Very Low
Costs	Not reported	-	-
GRADE: GRADE Working Group grades of evidence (see above and last page)			

2) Structural interventions

The structural interventions were complex and included: the use of communication technologies (telephones and radios), building maternity waiting homes, and purchasing ambulances.

- ➔ **It is uncertain whether structural interventions reduce maternal mortality because the certainty of this evidence is very low.**
- ➔ **Structural interventions may reduce neonatal mortality. The certainty of this evidence is low.**
- ➔ **It is uncertain whether structural interventions reduce the number of stillbirths because the certainty of this evidence is very low.**
- ➔ **None of the included studies assessed the cost implications of these interventions.**

Structural interventions to improve referrals compared to no intervention

People Pregnant women and postpartum women
Settings Rural areas in low-income countries
Intervention Structural
Comparison Standard care

Outcomes	**Impact**	Number of studies	Certainty of the evidence (GRADE)
Maternal mortality	It is uncertain whether structural interventions lead to a reduction in maternal mortality	4 studies	⨁◯◯◯ Very low
Neonatal mortality	Structural interventions may lead to a reduction in neonatal mortality	2 studies	⨁⨁◯◯ Low
Stillbirths	It is uncertain whether structural interventions lead to a reduction in stillbirths	3 studies	⨁◯◯◯ Very low
Cost	Not reported	–	–

GRADE: GRADE Working Group grades of evidence (see above and last page)

Relevance of the review for low-income countries

➔ Findings	▷ Interpretation*
APPLICABILITY	
➔ **All of the included studies were conducted in rural settings in low-income countries.**	▷ *These findings are likely to be applicable to other low-income countries.* ▷ *These interventions are interlinked with phase I (delays in the recognition of the problem and the decision to seek care at a household level) and phase III (delays in the care received once a woman reaches a facility) interventions, and therefore cannot be implemented as stand-alone approaches.*
EQUITY	
➔ **This review included studies in rural settings.**	▷ *The interventions were tested in rural areas. They are therefore likely to benefit poor people living in rural areas who have limited access to healthcare services.* ▷*These interventions might help to increase facility-based deliveries for disadvantaged populations.*
ECONOMIC CONSIDERATIONS	
➔ **No cost data were included in the studies (e.g. the cost of building and maintaining maternity homes); economic outcomes were not reported.**	▷ *Capital costs (such as the cost of constructing a maternity home, buying ambulances, hiring professionals) could be high.*
MONITORING AND EVALUATION	
➔ **The interventions described in this review were complex interventions.**	▷ *Evaluations of the interconnection between various interventions in the three phases of delay using both qualitative and quantitative research (mixed methods research) are needed.* ▷ *Most of the included studies were uncontrolled before-after studies, which have a high risk of bias. Controlled studies, particularly randomized trials, would provide a more robust assessment of the impact of emergency obstetric referral interventions.*

*Judgements made by the authors of this summary, not necessarily those of the review authors, based on the findings of the review and consultation with researchers and policymakers in low-income countries. For additional details about how these judgements were made, please see: www.supportsummaries.org/methods

Additional information

Related literature

Lassi ZS, Bhutta ZA. Community-based intervention packages for reducing maternal and neonatal morbidity and mortality and improving neonatal outcomes. Cochrane Database of Systematic Reviews 2015, Issue 3.

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Conflict of interest

None declared. For details, see: www.supportsummaries.org/coi

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This review should be cited as

Hussein J, Kanguru L, Astin M, Munjanja S. The Effectiveness of Emergency Obstetric Refferal Interventions in Developing Country Settings: a Systematic Review. PLoS Med 2012; 9(7): e1001264.

The summary should be cited as

Karumbi J. Do emergency obstetric referral interventions reduce maternal and neonatal mortalities in low- and middle-income countries? A SUPPORT Summary of a systematic review. August 2016. www.supportsummaries.org

About the certainty of the evidence (GRADE)

The "certainty of the evidence" is an assessment of how good an indication the research provides of the likely effect; i.e. the likelihood that the effect will be substantially different from what the research found. By "substantially different" we mean a large enough difference that it might affect a decision. These judgements are made using the GRADE system, and are provided for each outcome. The judgements are based on the study design (randomised trials versus observational studies), factors that reduce the certainty (risk of bias, inconsistency, indirectness, imprecision, and publication bias) and factors that increase the certainty (a large effect, a dose response relationship, and plausible confounding). For each outcome, the certainty of the evidence is rated as high, moderate, low or very low using the definitions on page 3.

For more information about GRADE: www.supportsummaries.org/grade

SUPPORT collaborators:

The Cochrane Effective Practice and Organisation of Care Group (EPOC) is part of the Cochrane Collaboration. The Norwegian EPOC satellite supports the production of Cochrane reviews relevant to health systems in low- and middle-income countries . www.epocoslo.cochrane.org

The Evidence-Informed Policy Network (EVIPNet) is an initiative to promote the use of health research in policymaking in low- and middle-income countries. www.evipnet.org

The Alliance for Health Policy and Systems Research (HPSR) is an international collaboration that promotes the generation and use of health policy and systems research in low- and middle-income countries. www.who.int/alliance-hpsr

Norad, the Norwegian Agency for Development Cooperation, supports the Norwegian EPOC satellite and the production of SUPPORT Summaries. www.norad.no

The Effective Health Care Research Consortium is an international partnership that prepares Cochrane reviews relevant to low-income countries. www.evidence4health.org

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