May 2011 – SUPPORT Summary of a systematic review

Can in-service health professional training improve the resuscitation of seriously ill newborn and children in low-income countries?

Mortality among seriously ill neonates and children remains high in many low- and middle-income countries, even in healthcare facilities with professional staff. Most of these deaths occur within 48 hours of admission. In-service training courses in the emergency care of neonates and children are targeted towards professional healthcare staff. This is seen as a way of reducing mortality through training . However, most courses have been developed in high-income countries and their potential effectiveness in low- and middle-income country settings is unclear.

Key messages

In-service neonatal emergency care training of health professionals:

- **Probably increases the proportion of adequate initial resuscitation steps**
- **Probably decreases inappropriate and potentially harmful practices per resuscitation**
- **Probably leads to little or no difference in mortality in resuscitation episodes**
- **Probably improves preparedness for resuscitation**

Who is this summary for?

People making decisions concerning in-service training of health professionals to improve care of seriously ill newborn and children in low-income countries.

This summary includes:

- **Key findings** from research based on a systematic review
- **Considerations about the relevance of this research** for low- and middle-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:

Opiyo N, English M. In-service training for health professionals to improve care of the seriously ill newborn or child in low and middle-income countries (Review). *Cochrane Database of Systematic Reviews* 2010, Issue 4. Art. No.: CD007071. DOI: 10.1002/14651858.CD007071.pub2.

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 – an international collaboration funded by the EU 6th Framework Programme to support the use of policy relevant reviews and trials to inform decisions about maternal and child health in low- and middle-income countries.
www.support-collaboration.org

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

Background references on this topic:
See back page

Background

Neonatal and child mortality remains high in many low- and middle-income countries, particularly among the seriously ill. In healthcare facilities, most deaths among seriously ill neonates and children occur within 48 hours of admission. It has been argued that better emergency care training among professional staff in such settings could reduce mortality. Many courses in emergency care for neonates and children have targeted professional healthcare staff in low- and middle-income countries. These are typically designed as in-service training and have mostly been developed in high-income countries. Their effectiveness in low- and middle-income countries in terms of mortality, morbidity and healthcare resource use, however, is unclear. The teaching of such courses is associated with considerable financial costs and may potentially disrupt the standard functioning of the relevant services provided.

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- and middle-income countries. The methods used to assess the quality of the review and to make judgements about its relevance are described here: www.supportsummaries.org/methods

Knowing what's not known is important

A good quality review might not find any studies from low- and middle-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.

About the systematic review underlying this summary

Review objective: To investigate the effectiveness of in-service training of health professionals on their management and care of seriously ill neonates or children in low-income settings.

	What the review authors searched for	What the review authors found
Interventions	1. Neonatal life support courses 2. Paediatric life support courses 3. Life support elements within the Integrated Management of Pregnancy and Childbirth 4. Other in-service newborn and child health training courses aimed at the recognition and management of seriously ill children. Randomised controlled trials (RCTs), cluster randomised trials (CRTs), controlled clinical trials (CCTs), controlled before-after studies (CBAs), interrupted time series studies (ITSs).	1. 1-day NRT (Newborn Resuscitation Training) course 2. 4-day Essential Newborn Care Training course
Participants	Qualified healthcare professionals.	Qualified healthcare professionals: Doctors, nurses, and midwives
Settings	Healthcare delivery sites in low-income countries.	Delivery rooms in Kenya and Sri Lanka
Outcomes	1. Adherence to treatment guidelines. 2. Prescribing practices. 3. Clinical assessment and diagnosis. 4. Recognition and management or referral of the seriously ill newborn/child.	1. Proportion of adequate initial resuscitation steps. 2. Inappropriate and potentially harmful practices per resuscitation. 3. Mortality in all resuscitation episodes. 4. Preparedness for resuscitation.

Date of most recent search: May 2009

Limitations: This is a good quality systematic review with only minor limitations.

Opiyo N, English M. In-service training for health professionals to improve care of the seriously ill newborn or child in low- and middle-income countries (Review). *Cochrane Database of Systematic Reviews* 2010, Issue 4. Art. No.: CD007071. DOI: 10.1002/14651858.CD007071.pub2.

Summary of findings

Two RCTs of moderate quality were included: these assessed the effectiveness of the standardised in-service neonatal emergency care training of health professionals in Kenya and Sri Lanka. Both studies were conducted in a delivery room setting and the reported relevant outcomes were manifestations of adherence to treatment guidelines and clinical assessment and diagnosis.

1) In-service neonatal emergency care training of health professionals

- ➔ **Probably increases the proportion of adequate initial resuscitation steps**
- ➔ **Probably decreases inappropriate and potentially harmful practices per resuscitation**
- ➔ **Probably leads to little or no difference in mortality in resuscitation episodes**
- ➔ **Probably improves preparedness for resuscitation**

About quality of evidence (GRADE)

⊕⊕⊕⊕
High: It is very likely that the effect will be close to what was found in the research.

⊕⊕⊕◯
Moderate: It is likely that the effect will be close to what was found in the research, but there is a possibility that it will be substantially different.

⊕⊕◯◯
Low: It is likely that the effect will be substantially different from what was found in the research, but the research provides an indication of what might be expected.

⊕◯◯◯
Very low: The anticipated effect is very uncertain and the research does not provide a reliable indication of what might be expected.

For more information, see last page.

In-service neonatal emergency care training versus standard care for healthcare professionals

Patients or population: Nurses (Kenya); doctors, nurses and midwives (Sri Lanka)
Settings: Delivery rooms in Kenya and Sri Lanka
Intervention: Kenya: 1-day NRT (Newborn Resuscitation Training) course; Sri Lanka: 4-day Essential Newborn Care Training course
Comparison: No training (usual or standard care)

Outcomes	Comparative risks*		Relative effect (95% CI)	Number of participants (studies)	Quality of the evidence (GRADE)	Comments
	Without training	**With training**				
Proportion of adequate initial resuscitation steps	**27 per 100**	**66 per 100** (48 to 93)	RR **2.45** (1.75 to 3.42) p<0.001	83 (1study)	⊕⊕⊕◯ Moderate	Kenya Observation period: 50 days
Inappropriate and potentially harmful practices per resuscitation	**Mean: 0.92**	**Mean: 0.53** Mean difference: 0.4 (0.13 to 0.66) p=0.004		83 (1 study)	⊕⊕⊕◯ Moderate	Kenya Mean observation period: 50 days
Mortality in all resuscitation episodes	**36 per 100** (12 to 42)	**28 per 100** (17 to 40)	RR **0.78** (0.40 to 1.48) p=0.77	90 (1 study)	⊕⊕⊕◯ Moderate	Kenya Mean observation period: 40 days
Preparedness for resuscitation	**Mean: 19.29**	**Mean: 10.46** Mean difference: 8.83 (6.41 to 11.25) p<0.001		48 (1 study)	⊕⊕⊕◯ Moderate	Sri Lanka Observation period: 90 days Improvement

CI: Confidence interval RR: Risk ratio GRADE: GRADE Working Group grades of evidence (see above and last page)
*Illustrative comparative risks. The assumed risk WITHOUT the intervention is based on contemporary controls. The corresponding risk WITH the intervention (and it's 95% confidence interval) are based on the overall relative effect (and its 95% confidence interval).

Relevance of the review for low- and middle-income countries

➔ Findings	▷ Interpretation*
APPLICABILITY	
➔ **The studies included were conducted in LMICs.**	▷ *The strength and performance of health systems vary widely between countries and it is conceivable that the level and rigour of medical training has an influence on the outcomes of training interventions.*
EQUITY	
➔ **The review did not provide information on equity-related subjects.**	▷ *It is possible that courses are offered predominantly to staff in large, central healthcare facilities. These facilities tend to be relatively better equipped and often benefit the better-off disproprortionately. This could therefore negatively affect the poor who often live in rural areas or are unable to access such healthcare facilities due to prohibitive fees or limited access to transport.*
ECONOMIC CONSIDERATIONS	
➔ **The review did not provide information on the absolute costs or cost-effectiveness of the included studies.**	▷ *The review states that in-service training tends to be expensive and may be disruptive.* ▷ *Reduced mortality could lead to higher long-term healthcare costs as a result of higher resource usage. Reduced morbidity is likely have the opposite effect. The overall balance will probably depend on the baseline situation and the relative cause of morbidity of the seriously ill.*
MONITORING & EVALUATION	
➔ **The quality of evidence on the effectiveness of in-service training in neonatal and child emergency care is moderate.**	▷ *The impact of in-service training on long-term outcomes should be evaluated.* ▷ *In-service training should be evaluated in terms of cost and the resources required.* ▷ *The outcomes associated with in-service training in different settings should be evaluated.* ▷ *The effectiveness of different standard courses should be comparatively evaluated.*

*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- and middle-income countries. For additional details about how these judgements were made see: www.supportsummaries.org/methods

Additional information

Related literature

Baskett PJ, Nolan JP, Handley A, Soar J, Biarent D, Richmond S. European Resuscitation Council. European resuscitation council guidelines for resuscitation 2005. Section 9. Principles of training in resuscitation. *Resuscitation* 2005;**67S1**:S181–9.

Jabbour M, Osmond MH, Klassen TP. Life support courses: are they effective?. *Annals of Emergency Medicine* 1996;**28**:690–8.

Rowe AK, Rowe SY, Holloway KA, Ivanovska I, Muhe L, Lambrechts T. A systematic review of the effectiveness of shortening Integrated Management of Childhood Illness guidelines training: final report. World Health Organization 2008.

World Health Organization. The World Health Report: 2005: make every mother and child count. Geneva: World Health Organization 2005.

This summary was prepared by

Peter Steinmann, Swiss Tropical and Public Health Institute, Switzerland.

Conflict of interest

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

Acknowledgements

This summary has been peer reviewed by: Newton Opiyo, Kenya and Juan Lozano, Colombia.

This review should be cited as

Opiyo N, English M. In-service training for health professionals to improve care of the seriously ill newborn or child in low and middle-income countries (Review). *Cochrane Database of Systematic Reviews* 2010, Issue 4. Art. No.: CD007071. DOI: 10.1002/14651858.CD007071.pub2.

The summary should be cited as

Steinmann P. Can in-service training of health professionals improve resuscitation of seriously ill newborn and children in low-income countries? A SUPPORT Summary of a systematic review. May 2011. www.supportsummaries.org

Keywords

All Summaries:
evidence-informed health policy, evidence-based, systematic review, health systems research, health care, low and middle-income countries, developing countries, primary health care, training, neonatal, paediatric, life support.

About quality of evidence (GRADE)

The quality of the evidence is a judgement about the extent to which we can be confident that the estimates of effect are correct. These judgements are made using the GRADE system, and are provided for each outcome. The judgements are based on the type of study design (randomised trials versus observational studies), five factors that can lower confidence in an estimate of effect (risk of bias, inconsistency of the results across studies, indirectness, imprecision of the overall estimate across studies, and publication bias), and three factors that can increase confidence (a large effect, a dose response relationship, and plausible confounding that would increase confidence in an estimate). For each outcome, the quality 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 a Collaborative Review Group of the Cochrane Collaboration: an international organisation that aims to help people make well informed decisions about health care by preparing, maintaining and ensuring the accessibility of systematic reviews of the effects of health care interventions.
www.epocoslo.cochrane.org

The Evidence-Informed Policy Network (EVIPNet) is an initiative to promote the use of health research in policymaking. Focusing on low- and middle-income countries, EVIPNet promotes partnerships at the country level between policy-makers, researchers and civil society in order to facilitate both policy development and policy implementation through the use of the best scientific evidence available.
www.evipnet.org

The Alliance for Health Policy and Systems Research (HPSR) is an international collaboration aiming to promote the generation and use of health policy and systems research as a means to improve the health systems of developing countries.
www.who.int/alliance-hpsr

To receive e-mail notices of new SUPPORT summaries or provide feedback on this summary, go to:
www.supportsummaries.org/contact