

Cost and cost-effectiveness of newborn home visits: findings from the Newhints cluster-randomised controlled trial in rural Ghana

Catherine Pitt, Theresa Tawiah, Seyi Soremekun, Augustinus H A ten Asbroek, Alexander Manu, Charlotte Tawiah-Agyemang, Zelee Hill, Seth Owusu-Agyei, Betty R Kirkwood, Kara Hanson



Summary

Background Every year, 2.9 million newborn babies die worldwide. A meta-analysis of four cluster-randomised controlled trials estimated that home visits by trained community members in programme settings in Ghana and south Asia reduced neonatal mortality by 12% (95% CI 5–18). We aimed to estimate the costs and cost-effectiveness of newborn home visits in a programme setting.

Methods We prospectively collected detailed cost data alongside the Newhints trial, which tested the effect of a home-visits intervention in seven districts in rural Ghana and showed a reduction of 8% (95% CI –12 to 25%) in neonatal mortality. The intervention consisted of a package of home visits to pregnant women and their babies in the first week of life by community-based surveillance volunteers. We calculated incremental cost-effectiveness ratios (ICERs) with Monte Carlo simulation and one-way sensitivity analyses and characterised uncertainty with cost-effectiveness planes and cost-effectiveness acceptability curves. We then modelled the potential cost-effectiveness for baseline neonatal mortality rates of 20–60 deaths per 1000 livebirths with use of a meta-analysis of effectiveness estimates.

Findings In the 49 zones randomly allocated to receive the Newhints intervention, a mean of 407 (SD 18) community-based surveillance volunteers undertook home visits for 7848 pregnant women who gave birth to 7786 live babies in 2009. Annual economic cost of implementation was US\$203 998, or \$0.53 per person. In the base-case analysis, the Newhints intervention cost a mean of \$10 343 (95% CI 2963 to –7674) per newborn life saved, or \$352 (95% CI 104 to –268) per discounted life-year saved, and had a 72% chance of being highly cost effective with respect to Ghana's 2009 gross domestic product per person. Key determinants of cost-effectiveness were the discount rate, protective effectiveness, baseline neonatal mortality rate, and implementation costs. In the scenarios modelled with the meta-analysis results, the ICER increased from \$127 per life-year saved at a neonatal mortality rate of 60 deaths per 1000 livebirths, to \$379 per life-year saved at a rate of 20 deaths per 1000 livebirths. The strategy had at least a 99% probability of being highly cost effective for lower-middle-income countries in all neonatal mortality rate scenarios modelled, and at least a 95% probability of being highly cost effective for low-income countries at neonatal mortality rates of 30 or more deaths per 1000 livebirths.

Interpretation Our findings show that the seemingly modest mortality reductions achieved by a newborn home-visit strategy might in fact be cost effective. In Ghana, such strategies are also likely to be affordable. Our findings support recommendations from WHO and UNICEF that low-income and middle-income countries implement newborn home visits.

Funding The Bill & Melinda Gates Foundation, UK Department for International Development, WHO.

Copyright © 2015. World Health Organization; licensee Elsevier. This is an Open Access article published without any waiver of WHO's privileges and immunities under international law, convention, or agreement. This Article should not be reproduced for use in association with the promotion of commercial products, services or any legal entity. There should be no suggestion that WHO endorses any specific organisation or products. The use of the WHO logo is not permitted. This notice should be preserved along with the Article's original URL.

Introduction

Every year, 2.9 million newborn babies die worldwide; 98% of these deaths are in low-income or middle-income countries.¹ Existing interventions and care practices could prevent most of these deaths.² Saving newborn lives thus presents a health-systems challenge requiring cost-effective strategies to connect babies with the care and interventions proven to protect and restore their health.

Four initial proof-of-principle³ studies in south Asia showed that training of lay community health workers to do three home visits in the first week of life to promote essential newborn care practices and identify and refer or treat sick babies could reduce neonatal mortality by up to 60%.^{4–7} These studies contributed to the decision by WHO and UNICEF to issue a joint statement in 2009 exhorting all low-income and middle-income countries to

Lancet Glob Health 2016;
4: e45–56

Published Online
November 27, 2015
[http://dx.doi.org/10.1016/S2214-109X\(15\)00207-7](http://dx.doi.org/10.1016/S2214-109X(15)00207-7)
See [Comment](#) page e6

Department of Global Health and Development (C Pitt MSc, Prof K Hanson SD), Department of Population Health (S Soremekun PhD, A H A ten Asbroek PhD, Prof B R Kirkwood FMedSci), and Department of Disease Control (S Owusu-Agyei PhD), London School of Hygiene & Tropical Medicine, London, UK; Kintampo Health Research Centre, Ghana Health Service, Kintampo, Brong Ahafo Region, Ghana (T Tawiah MSc, A Manu PhD, C Tawiah-Agyemang MSc, S Owusu-Agyei); Department of Maternal, Newborn, Child and Adolescent Health, World Health Organization, Geneva, Switzerland (A Manu); Department of Global Health, Academic Medical Center, University of Amsterdam and Amsterdam Institute for Global Health and Development, Amsterdam, Netherlands (A H A ten Asbroek); and Institute for Global Health, University College London, London, UK (Z Hill PhD)

Correspondence to:
Ms Catherine Pitt, London School of Hygiene & Tropical Medicine, Department of Global Health and Development, London WC1H 9SH, UK
catherine.pitt@lshtm.ac.uk

implement a home-visit strategy for newborns.⁸ However, in 2013, a meta-analysis of four more recent cluster-randomised controlled trials estimated a more modest 12% (95% CI 5–18) reduction in the neonatal mortality rate in programme settings.³ One of the four more recent trials—Newhints—was done on a large scale in rural Ghana in 2007–09 (appendix) and estimated an 8% (95% CI –12 to 25; $p=0.405$) reduction in neonatal mortality rate.³ Since 2000, Ghana has been scaling up the community-based health planning and services initiative.⁹ This scale-up involved a cadre of salaried nurses deployed as community health officers who were supported by village health committees and unpaid community-based surveillance volunteers.^{10,11} There was no minimum education requirement for community-based surveillance volunteers, whose role focused on birth and death registration and disease surveillance.^{10,11} Newhints built on this existing group of community-based surveillance volunteers by providing them with additional training and supervision to enable them to expand their role to include prenatal and postnatal home visits.

As in the other three more recent cluster-randomised trials, Newhints was underpowered to detect statistically significant reductions in neonatal mortality rate at the levels recorded. Yet, despite differences in existing health systems, qualifications of home visitors, visit content, and other aspects of the home-visit packages, there was no evidence of heterogeneity in effectiveness between the four trials in programme settings ($p=0.85$), and together they had sufficient power.³ Newhints also showed statistically significant improvements in the coverage of many essential newborn care practices that were targeted in the strategy and expected to improve health outcomes.³ Findings from Newhints were therefore entirely consistent with those from the studies in south Asia and those from the meta-analysis, which summarised the evidence for newborn home-visit effectiveness and reported that a newborn home-visit strategy can achieve small but significant reductions in neonatal mortality.

In view of the seemingly modest effect of newborn home visits at scale and WHO's further recommendation in 2014 in favour of home visits for postnatal care,¹² evidence about the cost-effectiveness of a newborn home-visit strategy is particularly important to inform policy makers about whether this approach is likely to be an efficient use of resources. Such economic evidence is especially relevant in Ghana, where, after the Newhints trial, the Newhints strategy was expanded to the control areas and nationwide expansion is already underway. Of the two economic evaluations of home-visit strategies to date, the first provided some incomplete evidence from an early non-randomised study in India,¹³ whereas the second evaluated a study in Bangladesh in which the protective efficacy point estimate was far higher (28%)¹⁴ than in more recent studies.

We aimed to estimate the cost and cost-effectiveness of the Newhints strategy in rural Brong Ahafo Region in

Ghana, to model the potential cost-effectiveness in settings with a range of baseline neonatal mortality rates with use of a meta-analysis of effectiveness estimates, and to compare the incremental cost-effectiveness ratios (ICERs) with several standard thresholds and with currently implemented interventions. We also compared our findings with the cost-effectiveness of other community-based newborn health strategies.

Methods

Study design

Details of the study setting, intervention, and trial protocol are published elsewhere.¹⁵ The Newhints strategy was implemented in seven districts of the rural Brong Ahafo Region in western Ghana. The intervention consists of training an existing group of lay community health workers—community-based surveillance volunteers—to identify pregnant women in their communities and to do two home visits during pregnancy and three visits on days 1, 3, and 7 post partum. Each visit has a specific purpose and, taken together, they aim to improve delivery and newborn care practices and careseeking for sick newborn babies.¹⁵ In each intervention community, at least one community-based surveillance volunteer (N=406) was fully trained in 2008 to undertake the Newhints intervention in addition to their existing activities. An additional 49 volunteers were trained in June, 2009, to replace 17 volunteers who resigned and to support implementation in communities with the highest workloads.¹⁵ Implementation and management of the strategy was led by Kintampo Health Research Centre (KHRC), a part of the Ghana Health Service, in close collaboration with seven district health management teams and the London School of Hygiene & Tropical Medicine (LSHTM). Two supervisors in each district health management team provided direct supervision and support to the community-based surveillance volunteers.

The combined population of the seven study districts, which comprised about 770 000 people,¹⁶ including more than 120 000 women of reproductive age and more than 15 000 annual births, was divided into 98 supervisory zones of which half received the intervention. Surveillance data were collected monthly from every woman of reproductive age in the study area until June, 2009, and every second month from pregnant women and infants from July, 2009, until March, 2010 (appendix). The neonatal mortality rate at baseline (2005–07) was 32.7 deaths per 1000 livebirths in the control zones and 32.3 deaths per 1000 livebirths in the Newhints zones. In July, 2008, the Ghana National Health Insurance Scheme eliminated user fees for antenatal, intrapartum, postpartum, and newborn care in public, private, and mission facilities.¹⁷ Subsequently, the rate of facility-based births increased by 7.5%,¹⁷ but was similar between the Newhints and control zones (68.7% vs 68.4%) in 2009.³

See Online for appendix

Download English Version:

<https://daneshyari.com/en/article/3408846>

Download Persian Version:

<https://daneshyari.com/article/3408846>

[Daneshyari.com](https://daneshyari.com)