From home to hospital, a continuum of care: making progress towards Millennium Development Goals 4 and 5 in rural Bangladesh

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The Lutheran Aid to Medicine in Bangladesh (LAMB) health and development project in rural Bangladesh has developed an integrated maternal and child healthcare system providing appropriate, accessible and affordable health services for the poor, through a home-to-hospital, continuum-of-care approach. LAMB is thus an example of how high-quality maternity health services accessible to women of all socio-economic classes in a rural context can be provided, making progress towards Millennium Development Goals 4 and 5.

Keywords Bangladesh, Community health, maternal health, Millennium Development Goals, Home to hospital, CEDC, integrated maternal and child healthcare system.

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Introduction

Situated in the rural north-west of Bangladesh, the Lutheran Aid to Medicine in Bangladesh (LAMB) Integrated Rural Health and Development Project was established in 1970 by a North American missionary organisation in response to the lack of health care in a very poor and isolated area of the country. The project currently comprises: (1) community healthcare services organised in 23 unions (local administrative areas or LAAs, comprised of several villages), serving a total population of approximately 700,000 people; within these unions, LAMB focuses on working with and on behalf of the poorest of the poor; (2) a 150-bed general hospital providing comprehensive emergency obstetric care, general surgery, medicine and paediatric services; and (3) a residential training centre providing a wide range of courses in health and community development.

Over the years, LAMB has developed an integrated maternal and child healthcare system, providing appropriate, accessible and acceptable health services for the poor. These services are provided through a ‘home-to-hospital, continuum-of-care’ approach.

The maternal health strategy is based on the tenets that:

- pregnancy is not a disease, and most needs are routine;
- all women are at risk of developing complications;
- most complications can be neither accurately predicted nor prevented;
- therefore, when a complication develops, the woman needs, and has the right to, prompt access to appropriate emergency obstetric care.

The LAMB project endeavours to create an ethos of responsibility and accountability, thus increasing the community trust in, and use of, healthcare facilities. A crucial element in the continuum of care is that all cadres of health workers are linked into a system that works and provides additional levels of care, from basic obstetric first aid up to and including comprehensive emergency obstetric care.

Village health volunteers

The primary care workers are village health volunteers (VHVs). They receive no formal remuneration. These are women who are selected by the community, and are often already involved in some level of healthcare provision. As trusted and trained healthcare workers, their key role is in advocating for and facilitating women to access the level of health care that they need. Their level of formal education is often low, so the teaching aids and records that they use are pictorial. Each VHV is responsible for a group of 250 households and identifies and links all
pregnant women with antenatal care, birth planning and postnatal care. They visit women within 48 hours of home delivery, and promote early and exclusive breastfeeding, as well as encouraging child immunisation and family planning. VHV s are trained in the recognition and referral of women with complications during pregnancy, labour and delivery, or in the puerperium. In addition, they are trained to recognise and refer the sick newborn. In some villages, VHV s provide clean delivery services, as there is still a demand from women for such services, but this role is gradually diminishing. LAMB is currently trialling a pictorial partogram for use by VHV s to improve the recognition of and referral for prolonged labour and birth asphyxia.

Community health workers

Community health workers (CHWs) are women working within their own home community. They have 6 weeks of training in primary health care provided by LAMB. Their main responsibilities are health education, the maintenance of the maternity register and the register for children under 5 years of age, the identification of children with disabilities and the provision of help at disability clinics, and the supervision of VHV s, but they do not themselves conduct deliveries and are not considered to be skilled birth attendants.

Skilled birth attendants

The next level of healthcare worker is the community skilled birth attendant (cSBA). In the LAMB community, cSBAs are women selected from and by their own communities, and are paid a salary by the Health and Development Committee. They have a higher level of formal education (minimum school leaving certificate) than VHV s. LAMB participates in the national cSBA training programme, training women sent by the Government of Bangladesh and health sector non-governmental organisations (NGOs). Community SBAs receive 6 months of training in antenatal and postnatal care, safe delivery, the recognition of danger signs, and the provision of obstetric first aid and neonatal care. Community SBAs are then licensed by the Bangladesh Nursing Council to practise within the community.

Healthcare centres

Each LAA has a health and development committee (HDC), comprised of local men and women elected by the local community. These HDCs establish and run their own healthcare centres (HCCs). There are 22 clinics in total in the LAMB target areas, covering a population of about 700,000 people. These HCCs are staffed by LAMB-trained community health assistants (CHAs), and provide antenatal and postnatal care, family planning, vaccinations and the integrated management of childhood illnesses. CHAs have 6 weeks of basic clinical training, followed by 4 months of basic clinical training, again provided by LAMB.

In 17 of the HCCs, safe delivery units (SDUs) are run by the HDCs with technical support from LAMB staff. An SDU is staffed by cSBAs to provide round-the-clock obstetric first aid and the monitoring of labour using partograms. The cSBAs receive monthly supportive supervisory visits from LAMB midwives who are based at the LAMB hospital, and the cSBAs can also contact the LAMB midwives by mobile phone for advice at any time of the day or night. Transport to emergency obstetric care facilities, by whatever means that are most appropriate, is the responsibility of the HDC. In 2009 there were 2044 deliveries in SDUs; 17% of deliveries in LAAs were at SDUs. The fees for delivery and/or referral are set by the HDC at a level that covers the costs of salaries for the healthcare workers. Other costs, including the costs of further training and supervision, are covered by funding from other NGOs for example, from PLAN International and the TEAR Fund. In some areas the communities have instituted subsidies for those who cannot afford even these modest fees. Money is raised partly through contributions of 1 taka (approximately 1.5 cents) per month per household, and through donations given at Muslim and Hindu religious festivals.

Comprehensive essential obstetric and newborn care

The LAMB project provides a 150-bed referral general hospital, which provides round-the-clock comprehensive essential (or emergency) obstetric care (CEOC). A total of 3700 deliveries a year are carried out at the hospital. A fee for the service is charged, with fees set at a level that covers the running costs of the hospital. All patients have access to a means-tested poor fund, so that no one is turned away for lack of finance, and people can contribute according to their ability to pay. Approximately 70% of patients receive a subsidy of some sort, and a total of 30% of bills are paid by the poor fund. Blood transfusion is available through a ‘walking blood bank’: families are encouraged to donate blood, but many of the staff are also willing to give blood in an emergency.

Accessible, affordable health care can only be provided by appropriate personnel. LAMB has developed an advanced midwifery course for senior midwives. Midwives who complete the course achieve competency in initiating the management of postpartum haemorrhage, eclampsia and sepsis, and in performing neonatal resuscitation.
Advanced midwives also oversee the clinical training of VHV s and cSBAs working in LAMB target areas, and also those enrolled in the national cSBA training programme.

Appropriate personnel also include non-physician anaesthesia providers. These are nurses and paramedics who receive on-site training, and who provide a 24-hour anaesthesia service – a vital component of emergency obstetric care, and all too often the ‘missing link’ in service provision. The training is provided by LAMB medical personnel and visiting anaesthetists, and consists of theoretical training and supervised clinical competency-based training. The junior providers can competently administer ketamine and spinal anaesthesia; the senior providers can undertake general anaesthesia with intubation. An audit of the obstetric anaesthetic service was carried out, looking at caesarean sections in the years 2001–2006. Over these 6 years, 3316 caesarean sections were performed in 16 634 deliveries. There were 67 maternal deaths during this period, and in 22 of these cases the women had had surgery, and nine of these women had undergone caesarean sections. All the case notes were reviewed. There were no cases in which anaesthesia was the direct cause of maternal death. Non-physician anaesthesia providers make a significant, safe contribution to the provision of round-the-clock CEOC.

Kangaroo mother care is used, in preference to incubators, for newborn babies, with very good results. Premature and low-birthweight babies are nursed skin-to-skin by their mothers (or other caregivers) for 24 hours a day. This provides optimum temperature control, reduces infection and apnoea rates, facilitates breastfeeding and increases weight gain.

**Results**

In LAMB areas, high proportions of mothers receive antenatal care (81%), choose an SBA (32%), are able to have a caesarean section if needed (4.8%, compared with 2.7% in the national sample) and are visited by volunteers or health workers for postpartum care (85%) (Figure 1). In the national survey, postpartum care was provided within 42 days of delivery, whereas the LAMB project ensures that women receive postnatal care within 48 hours of delivery.3

Figures 2–5 show that, within the LAMB catchment area, a higher proportion of poor women (in wealth quintile 1) receive antenatal care, skilled birth attendance, caesarean section and postpartum care compared with poor women in Bangladesh as a whole.

In addition, the gap in service use between the poorest and the richest women is much smaller in LAMB-served areas than is found nationally (Figure 6). For all services, the gap between the richest and poorest quintiles has increased for the country as a whole between 2001 and 2007.3,4 Although the coverage of services has increased overall in Bangladesh, there is evidence that the gap between rich and poor women accessing maternity health services in Bangladesh is widening.

**Strengths and weaknesses of the LAMB health and development project**

One of the strengths of LAMB’s model of care is that it involves an integrated system of health care, from home to hospital, with collaboration and teamwork at all levels. It also includes appropriate skills-based training. The VHV s, CHWs and cSBAs are all local women, who take great

**Audit and review**

An appropriate review of practice is also a feature of the LAMB model. LAMB has pioneered the use of confidential, no-blame perinatal and maternal death audit within Bangladesh.2 This facilitates interdepartmental communication and teamwork. It can address areas for improvement and allows for the regular review of protocols. Through the Saving Newborn Lives initiative of the Save the Children Fund, LAMB staff designed a training module and conducted workshops to train obstetric, paediatric and midwifery staff in the use of the perinatal death audit in 22 institutions in Bangladesh. The LAMB hospital has achieved a reduction of 26% in the perinatal mortality rate since the introduction of perinatal death reviews. Within the community, all maternal and child deaths are investigated through ‘verbal autopsy’: CHWs interview all those involved in the situation to establish both medical and nonmedical factors in the death. The verbal autopsies are then reviewed by LAMB staff and relevant factors are fed back to the HDCs for action.

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**Women receiving care – LAMB areas and national sample**

Blue = national sample n = 6058
Maroon = LAMB sample n = 10 011
Legend: ANC = Antenatal care visit; Skilled attendant = at birth; PP visit = Postpartum visit
Ref BDHS 2007; LAMB database;
From Home to Hospital – a continuum of care.

Figure 1. Care received by women in the LAMB project (n = 10 011), compared with a national sample (n = 6058).
pride in being able to care for their respective communities, and because they are locally based the attrition rate is very low. Through this capacity-building process, communities are managing their own health care, and take a great deal of pride in this.

The model is, however, intensive with regard to training and ongoing supervision, and this may not be replicable within the government system, which has limited resources. LAMB receives donor funding and also has a number of international volunteers who contribute skills at no cost to the project.

There are many opportunities within the system. LAMB provides a model of supportive supervision and an integrated referral system that can inform other healthcare systems. If more supported cSBAs were to be employed at union-level health facilities (government health posts in each administrative unit, with a catchment population of approximately 20 000), they could offer 24-hour delivery services and increase the availability of obstetric first aid coverage with skilled birth attendance in Bangladesh.

**Threats**

Threats to the LAMB project include competition through ‘demand side financing’. This is a scheme that gives financial incentives to women to attend specified...
healthcare facilities, and then reimburses those facilities for the care given; at present, these do not include the community-managed SDUs or the LAMB hospital. The SDUs and the hospital rely on community use to remain viable, and for the clinical training of SBAs and other healthcare workers.

This model of a home-to-hospital continuum of care has been shown to be effective in making appropriate health care accessible to women across the socio-economic spectrum, thereby making progress towards Millennium Development Goals 4 and 5.

Disclosure of interests
Both authors work for the LAMB project in a voluntary capacity.

Contribution to authorship
Christine Edwards wrote the paper in collaboration with Stacy Saha. Stacy Saha provided the analysis of the access of care by wealth quintile data.

Details of ethics approval
None required.

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