

A Brief History of Community Health Worker Programs

Henry Perry

18 September 2013

Key Points

- The first Community Health Workers (CHWs) were “Farmer Scholars” who were trained in China in the 1930s and were the forerunners of the Barefoot Doctors, of whom there were more than one million from the 1950s to the 1970s.
- In the 1960s and 1970s, small CHW programs began to emerge in various countries, particularly in Latin America.
- The experience from CHW programs predating the 1970s provided the inspiration for much larger CHW programs in many low-income countries in the 1980s.
- Following the failure of many of the programs in the 1980s and 1990s, new highly successful programs have emerged and, at present, as a result of research findings demonstrating the effectiveness of community-based programs in improving child health in particular, there is now a resurgence of interest and growth of CHW programs around the world.

ORIGINS AND EARLY HISTORY OF COMMUNITY HEALTH WORKER PROGRAMS

The first example of formally well-trained non-physicians to carry out duties that were normally given to physicians is Russia's Feldshers who, in the late 1800s, were trained as paramedics to assist physicians and to function in their stead in rural areas where physicians were not present. In contrast to the Barefoot Doctors in China and their forerunners at Ding Xian in the 1920s, Feldshers were literate and had three years of formal training. Large numbers of Feldshers also obtained training in midwifery.^{1, 2} Further, Feldshers were local people with limited training (and were therefore not formally trained medical doctors) who were authorized by the state to provide primary health care (PHC) services in rural villages. In this sense, they constitute an important forerunner of the CHW movement.

The first example of a large-scale CHW program was in Ding Xian, China, in the 1920s. At that time, Dr. John B. Grant, of the Rockefeller Foundation assigned to Peking Medical University, and Jimmy Yen, a Chinese community development specialist with a background in teaching literacy to adults, trained illiterate farmers to record births and deaths, vaccinate against smallpox and other diseases, give first aid and health education talks, and help communities keep their wells clean.^{3, 4} These services were delivered by what were originally known as Farmer Scholars, who later became known as Barefoot Doctors in communities where the infant mortality was more than 200 deaths per 1,000 live births and life expectancy was only 35 years.⁵ This CHW program grew rapidly, parallel to and in close coordination with the people's commune movement. By 1972, there was an estimated one million Barefoot Doctors serving a rural population of 800 million people in the People's Republic of China (or roughly one per 800 people).

These Barefoot Doctors were peasants who were given three months of training (which would correspond to our category of health extension worker [HEW]). They were expected to work half-time performing their health-related duties—which included environmental sanitation, health education, immunization, first aid, and basic primary medical care—and half-time doing agricultural work.⁶ Central to the role of the Barefoot Doctors was their expected contribution serving as change agents, engaging their fellow community members in addressing and taking responsibility for their health problems.³

In the 1960s, the inability of the modern Western medical model of trained physicians to serve the needs of rural and poor populations throughout the developing world was becoming progressively more apparent. The need for new approaches was obvious, and the Barefoot Doctor concept gained attention around the world as a type of alternative health worker who could complement more highly trained staff who did not have university-type training as medical doctors or graduate nurses, such as auxiliaries and paramedics.⁷ During this period, the Barefoot Doctor approach served as a guiding concept for early CHW programs in many countries, including Honduras, India, Indonesia, Tanzania, and Venezuela.

With these pioneering experiences and with a growing awareness of the failure of the Western "missionary model," the Christian Medical Commission (CMC), a unit of the World Council of Churches, based in Geneva, began to envision a new approach to providing health services in developing countries. This approach was based on principles of: social justice, equity, community participation, prevention, multi-sectoral collaboration, decentralization of services to the periphery as close as possible to the people, appropriate technology, and provision of services by a team of workers, including community-based workers. Leaders of the World Health Organization (WHO), just down the street from the CMC, began to interact with the CMC and be influenced by them.⁸

These new ideas were reflected in a WHO book published in 1975 entitled *Health by the People*, which consisted of a series of case studies from different countries where CHWs were the foundation of innovative (generally small-scale) community health programs.⁹ The book served as part of an intellectual foundation for the International Conference on Primary Health Care at Alma-Ata, USSR (now Kazakhstan) in 1978, sponsored by WHO and the United Nations Children’s Fund (UNICEF). This conference was attended by official government representatives from virtually all WHO and UNICEF member countries, making it the first truly global health conference. Ultimately, the conference resulted in the Declaration of Alma-Ata, which called for the achievement of “Health for All” by the year 2000 through PHC. The Declaration was explicit in defining a role for CHWs. Article VII.7 of the Declaration states:

Primary health care ... relies, at local and referral levels, on health workers, including physicians, nurses, midwives, auxiliaries, and community workers as applicable, as well as traditional practitioners as needed, suitably trained socially and technically to work as a health team and to respond to the expressed health needs of the community.¹⁰

Thus, the Declaration explicitly defined CHWs as one of the important providers of PHC in certain circumstances.

During this early period of experience with CHWs, the movement incorporated two agendas: the first was a **service-oriented** agenda of extension of preventive and curative services within the existing health system, while the second was a **transformative** agenda concerned with engagement of communities in the process of taking responsibility for their health, and addressing the environmental, social, and cultural factors that produce ill health, including inequity and deep poverty.¹¹⁻¹⁴ This latter orientation was particularly strong in Latin America.

New approaches to health service delivery were particularly important in post-colonial countries in Africa in the 1960s and 1970s, as well as in newly established centrally planned economies.¹⁴ In the 1970s and 1980s, there was a proliferation of government CHW programs at national scale in countries such as Indonesia,¹⁵ India,¹⁶ Nepal,¹⁶ Tanzania,¹⁸ Zimbabwe,¹⁷ Malawi, Mozambique, Nicaragua¹⁹ and Honduras,²⁰ as well as in other Latin American countries. During the same period, there was also the beginning of smaller CHW programs operated by nongovernmental organizations (NGOs) in many low-income countries around the world.

In the 1980s, it was becoming apparent that a number of large-scale programs were encountering serious difficulties due to inadequate training, insufficient remuneration or incentives, along with insufficient continuing education, supervisory support, integration with the health system, logistical support for supplies and medicines, and acceptance by higher-level health care providers. Furthermore, in many CHW programs, political favoritism led to the selection and training of individuals who were not well-motivated or suited for the role of CHW.³ A series of publications in the late 1980s brought attention to these issues, but they expressed optimism that these problems could be overcome without a major setback to the global PHC and CHW movements.²¹⁻²³

WHY COMMUNITY HEALTH WORKER PROGRAMS FAILED IN THE 1980S AND 1990S

Further issues arose in the 1980s. The rising prominence of selective approaches that did not require CHWs, as well as the loss of momentum of the nascent PHC movement as envisioned at Alma-Ata, led to the demise of a number of large-scale CHW programs. Additional factors also

contributed to this faltering. The global oil crisis of the 1970s led to a global recession and a debt crisis for many developing countries in the 1980s. Governments were forced by international donors, most notably the World Bank, to embrace free market reforms and to reduce their public sector financing, including financing for health services. Thus, financial resources needed to support new health initiatives, including large-scale CHW programs, were not available.^{14, 24} The cumulative effect of these shocks led to loss of financial and political support for comprehensive PHC generally,²⁴ and many CHW programs fell by the wayside.¹⁴

Political commitment for PHC and for strong and effective CHW programs was often lacking. There was a sense that these programs represented “second class care” and that CHWs were a temporary solution. Returning to strategies prevalent before Alma-Ata, priority was again given to investments in secondary and tertiary levels of care, often benefitting primarily urban and elite populations whose influence on government decision-making for health services was notable.²⁵ Furthermore, monitoring and evaluation systems for PHC programs and for large-scale CHW programs were weak, and evidence of their effectiveness and cost-effectiveness were limited.²⁵ In a publication released in 1992, when there were more than two million CHWs throughout the world, one knowledgeable observer remarked that:

...it is striking how little is known about what CHWs actually do in relation to the tasks assigned to them, the impact of these activities upon health status, how much time they actually spend doing these various tasks, the response they find among the communities they serve, attrition rates, and costs of CHW programs.¹³

Another reason for the loss of momentum among large-scale CHW programs in the 1980s was that these programs required more financial and supervisory inputs than had been originally envisioned.²¹ Consequently, many governments reduced or discontinued their CHW programs in the late 1980s and early 1990s, as efforts at selective PHC and vertical programs with strong international donor and technical support gained prominence.^{3, 26}

EVOLUTION OF COMMUNITY HEALTH WORKER PROGRAMS THAT EMERGED DURING THE MID-1980S

Successful examples of CHW programs at scale began to emerge during the mid-1980s. Among the most notable was the Brazil national health care program (i.e., Special Service for Public Health – *Serviço Especial de Saúde Pública*, or SESP), which started in 1987. Since then, the program has been able to gradually achieve universal coverage of PHC services and marked improvement of population health status. Of note, the program employs health teams that include one of the largest CHW networks in the world, consisting of 222,280 CHWs called *visitadoras*, who provide home visits and services to 110 million people.²⁷⁻²⁹ (See Box 1.)

Box 1. The Brazilian CHW Program

The Brazilian public health system dates back to large vaccination and other campaigns that were implemented by sanitary police in the late 1800s and early 1900s. The history of the health system is well-characterized by Paim and colleagues in a recent Lancet series on Brazil.³⁰ Briefly, the health system was shaped by the country’s tumultuous history. Public health was institutionalized under the Vargas dictatorship, and Brazil’s first Ministry of Health was later formed in 1953. A strong private health care system also developed during this time and continued to expand with the support of the federal government, as did PHC programs. The country transitioned from dictatorship to democracy, and 1985 marked the start of the New Republic. The 1986 8th National Health Conference established the principle that health is “a citizen’s right and the state’s duty.”³¹

The *Sistema Único de Saúde* (SUS) (Unified System of Health) was instituted as part of the constitution in 1988. The system has its origins in the struggle for democracy within the country, and health is defined broadly as encompassing social and political dimensions beyond the scope of traditional medical services.³¹ This development was associated with a movement to provide social protection, social mobilization, and expansion of social rights³² to facilitate “community participation, integration, shared financing among the different levels of government, and complementary participation by the private sector”³³ and to provide free access to services.³⁴ States and municipalities were given taxation authority, and federal guidelines mandated that 10% of this revenue be allocated to health.³⁵

CHW programs have been implemented in Brazil for decades, including the successful *Visitadora Sanitaria* program in which these workers provided immunizations, information, and various other maternal and child health interventions.²⁷ The Community Health Agent (CHA) Program developed as a pilot in Ceará and influenced subsequent primary health care programs.³⁶ The program started in the late 1980s during a drought, after initial pilot projects, including a project that trained 6,000 women in 112 municipalities. The women received two weeks of training to promote breastfeeding, the use of oral rehydration salts, and immunization.³⁵ In 1989, 1,500 of the original 6,000 CHWs were incorporated with a new CHA system, supervised by local nurses. These CHAs provided mostly health promotion and health education services to clearly defined geographic areas near their homes. The program was highly successful and served as a model for subsequent CHA programs.³⁵ It did, however, face formal resistance from nurses for a variety of reasons, including unclear roles and overlap of CHA work with that of auxiliary nurses.³⁷ The first national Community Health Agent Program (CHAP) was developed in 1991 and implemented as a first national PHC effort, later becoming integrated with the *Programa Saúde da Família*.³⁸

The *Programa Saúde da Família* (PSF) (Family Health Program, now called the Family Health Strategy)—was launched in 1994 to expand health care access to the poorest Brazilians.³⁴ CHAs in programs such as the one in Ceará have been integrated with the PSF.³⁵ In 1996 the federal government transferred control of the management and financing of health care services to the states³⁹ and in 2002 CHAs were officially recognized as professionals by Law No. 10.507/2002. CHAs originally provided vertical maternal and child health services, but have evolved into the cornerstone of PHC services.³¹

In the mid-1970s, Bangladesh had started a community-based family planning (FP) program with an initial cadre of family welfare assistants that expanded in the mid-1980s and was complemented by NGO CHWs working in FP. By 1997, Bangladesh had 30,000 female CHWs providing home-based FP services.⁴⁰ This program became what has been widely regarded as one of the world’s most successful FP programs in a developing country not undergoing rapid socio-economic development. In the mid-1980s, BRAC, a national Bangladeshi NGO, initiated a CHW program composed of women who were members of a BRAC micro-credit savings group. Each group had women who obtained special training in an area of personal interest, including various types of income-generating activities or health. The CHWs were called Shasthya Shebikas. This program expanded gradually such that, at present, this national NGO cadre consists of 100,000 CHWs who reach more than 110 million people with comprehensive services.^{14, 40}

Another notable program that emerged in the late 1980s is Nepal’s Female Community Health Volunteer (FCHV) Program, established in 1988. This program arose out of an earlier CHW program that had begun in Nepal following the 1978 Alma-Ata Conference and failed to receive continued funding from the government in the early 1980s. The resurrected program engaged female volunteers, many of whom had been trained under the initial CHW program, but were

abandoned in the earlier 1980s. Initially, their role consisted of FP promotion, first aid, and some dispensing functions. But, beginning in 1993, the government of Nepal progressively introduced twice-annual distribution of vitamin A capsules to children, delivered by FCHVs. Over the following decade, the National Vitamin A Program gradually scaled up to cover the whole country. Over the past decade, these 40,000 FCHVs have taken on expanded responsibilities that include detection and treatment of common childhood diseases (including pneumonia), distribution of oral contraceptives, and promotion of available health services for first aid, antenatal care, FP, and immunization.^{41, 42}

Bangladesh, Brazil, and Nepal are noteworthy because they have had some of the most rapid achievements in reducing under-five mortality in the world since 1990.⁴³ The strong CHW programs in each of these countries have all made vital contributions to this important achievement.

COMMUNITY HEALTH WORKER PROGRAMS THAT HAVE EMERGED SINCE 1990

More recently, multiple countries have begun to invest again in large-scale CHW programs. The Lady Health Worker (LHW) Program in Pakistan was launched in 1992 and has gradually scaled up to serve 70% of the rural population, with around 100,000 workers at present.⁴⁴ (See Box 2.) Uganda introduced its Village Health Team Strategy in 2003.⁴⁴ In 2004, Ethiopia began to train health extension workers (HEWs), who now number more than 30,000.⁴⁴ India initiated a Rural Health Mission in 2005 that involves support for more than 800,000 workers called Accredited Social Health Activists (ASHAs).⁴⁴

Over the past decade, as evidence has continued to accrue on the effectiveness of interventions delivered by CHWs, enthusiasm has grown for a stronger investment in CHW programs as a strategy for accelerating progress to reach the Millennium Development Goals (MDGs) for PHC.

Box 2. The Pakistan CHW Program

Pakistan's formal support for PHC dates back to the country's signing of the 1978 Declaration of Alma-Ata.⁴⁵ In 1993, Pakistan established the Prime Minister's Program for Family Planning and Primary Health Care, which employed CHWs to provide PHC services in their communities. The program subsequently only employed female CHWs. The Lady Health Worker (LHW) Program was developed in 1994.⁴⁶ The goal of the program is to reach rural areas and urban slums with a set of essential PHC services, including promotive, preventive, and curative,⁴⁷ to improve patient-provider interactions, to facilitate timely access to services,⁴⁸ to increase contraceptive uptake, and ultimately to reduce poverty.⁴⁵ In 2000, the program was renamed the National Program for Family Planning and Primary Health Care, but it is still commonly called the Lady Health Worker Program.⁴⁹

The 2003–2011 Strategic Plan set the two goals of improving quality of services and expanding coverage of the LHW Program. Key determinants of LHW provision of high-quality service were described as: selection based on merit; provision of professional knowledge and skills; supply with necessary medicines and other supplies; and adequate remuneration, performance management, and supervision. A management information system was also understood to be essential to assess and encourage high-quality performance and facilitate informed programmatic decision-making.⁵⁰ The 2001–2011 National Health Policy described “investment in the health sector as a cornerstone of the government's poverty reduction plan.”⁴⁷ At present, there are approximately 100,000 LHWs.

The LHW Program has evolved over time, and LHWs' scope of services has grown from its initial

focus on maternal and child health. It now also includes participation in large health campaigns, newborn care, community management of tuberculosis, and health education on HIV/AIDS. There are concerns, though, that the expansion in the LHWs' role and tasks has increased their job-related stress.⁵¹ LHW programs have also been advertised in a series of mass-media campaigns that promote community uptake of and respect for LHW services.⁵²

In spite of growing enthusiasm for expanding CHW programs, as evidenced by a recent high-level call by a global task force to train one million CHWs in Africa,⁵³ it remains the case, as Frankel noted two decades ago,¹³ that our knowledge of the effectiveness of large-scale CHW programs remains limited, and the challenges faced by early large-scale CHW programs appear to still be present.

RENEWED INTEREST AND NEW PROGRAMS IN THE 2000S

A renewed interest in CHW programs has been sparked by a sense of urgency in achieving the MDGs, particularly MDGs 4 and 5 for reducing child and maternal mortality, and from a growing base of evidence on the potential contributions of CHW programs to the health status of populations.⁵³ This revitalized interest also arose from a commitment to (or financial demand for) decentralization of health services and expansion of services to the poorest segments of the population, who were being left behind by economic progress of the better-off segments of the population.

In Africa, the lack of progress in many countries fueled interest among government leaders and donors in either establishing new cadres of CHWs or, as in the case of South Africa, in reactivating a dormant CHW program that had been previously abandoned. Thus, Ethiopia established its Health Extension Worker Program in 2004 (see Box 3), while similar initiatives began in Malawi (see Box 4) and Kenya at around the same time.

Box 3. The HEW Program in Ethiopia

CHWs have an extensive history in Ethiopia dating back to the Alma-Ata Conference. One program during the 1980s civil war employed 3,000 CHWs in Tigray. These workers were selected by their communities to receive training in maternal, child, and environmental health and in malaria diagnosis and treatment. This program was suspended in 1991, at the end of the war, but various CHW programs continued throughout the country.⁵⁴

In 1997–1998, the Ethiopian Federal Ministry of Health launched the National Health Sector Development Program (HSDP). This program shifted the focus of the health system from predominantly curative to more preventive and promotive care and prioritized the needs of the rural inhabitants,⁵⁵ who account for 83% of the Ethiopian population.⁵⁶ A review of the first five years of the HSDP found that challenges remained in achieving universal PHC coverage.⁵⁷ In response to these identified needs, in 2003 the government of Ethiopia launched the Accelerated Expansion of Primary Health Care Coverage and the Health Extension Program (HEP).⁵⁸ Multiple stakeholders, including the Federal Ministries of Health, Education, Labor, Finance, and Capacity Building were involved in development of the HEW model.⁵⁹ The program was designed to expand health service coverage, particularly in rural areas, using locally available human resources. These included community-based human resources such as HEWs, voluntary community health workers (vCHWs)⁵⁸ and Community Health Promoters (CHPs). The first group of HEWs were trained in 2004–2005.⁶⁰ At present, there are 34,000 HEWs working out of 15,000 health posts.

Box 4. The Malawi CHW Program

The current CHW program in Malawi dates back to the 1950s, when Health Surveillance Assistants (HSAs) were recruited and salaried by the MOH to provide immunizations. In the 1960s and 1970s, the HSAs played a prominent role in the smallpox eradication campaign. They were at the frontline for managing cholera epidemics in the 1970s and 1980s and were engaged in environmental health education in the 1990s. With financial support from the Global Fund for HIV, Tuberculosis, and Malaria, in 2008, the government was able to double the size of the HSA workforce to 10,000, so that there would be one HSA for every 1,000 people. Today, they continue to provide health education, promote sanitation and hygiene, and conduct outreach clinics, including immunizations. However, they have, in addition, recently received training in integrated community case management (iCCM) and the diagnosis and treatment at the community level of childhood pneumonia, diarrhea, and malaria.⁶¹

CONCLUSIONS

The effective functioning of large-scale CHW programs offers one of the most important opportunities for improving the health of impoverished populations in low-income countries. This guide presents principles and programmatic suggestions that we hope will be useful as decision-makers and program implementers consider the initiation, expansion, or strengthening of CHW programs in their country.

Acknowledgments

The author thanks Shelly Amieva for helpful support with the literature review for this chapter.

References

1. Terris M. Issues in primary care. False starts and lesser alternatives. *Bull N Y Acad Med* 1977; **53**(1): 129–40.
2. USSR Ministry of Health. *The training and utilization of feldshers in the USSR: a report prepared by the Ministry of Health of the USSR for the World Health Organization*. Geneva: World Health Organization; 1974.
3. Rifkin S. Community Health Workers. In: Kirch W, ed. *Encyclopedia of Public Health*. Berlin: Springer Reference; 2008: 773–81.
4. Taylor-Ide D, Taylor C. *Ding Xian: The First Example of Community-Based Development. Just and Lasting Change: When Communities Own Their Futures*. Baltimore, MD: Johns Hopkins University Press in Association with Future Generations; 2002: 93–101.
5. Kan X. The current situation of the Village Health Worker programmes in China. In: Frankel S, ed. *The Community Health Worker: Effective Programmes for Developing Countries*. Oxford, England: Oxford University Press; 1992: 88–101.
6. Sidel VW. The barefoot doctors of the People's Republic of China. *N Engl J Med* 1972; **286**(24): 1,292–300.
7. King M, editor. *Medical care in developing countries*. Oxford, England: Oxford University Press; 1966.
8. Litsios S. The Christian Medical Commission and the development of the World Health Organization's primary health care approach. *Am J Public Health* 2004; **94**(11): 1,884–93.
9. Newell KW, editor. *Health by the People*. Geneva, Switzerland: World Health Organization; 1975.
10. WHO, UNICEF. Declaration of Alma-Ata: International Conference on Primary Health Care. September 6–12, 1978. Available at: http://www.who.int/publications/almaata_declaration_en.pdf (accessed 4 January 2013).
11. Werner D. The village health worker: lackey or liberator? *World Health Forum* 1981; **2**(1): 46–68.
12. Stark R. Lay workers in primary health care: victims in the process of social transformation. *Soc Sci Med* 1985; **20**(3): 269–75.
13. Frankel S. Overview. In: Frankel S, ed. *The Community Health Worker: Effective Programmes for Developing Countries*. Oxford, England: Oxford University Press; 1992: 1–61.
14. Standing H, Chowdhury AM. Producing effective knowledge agents in a pluralistic environment: what future for community health workers? *Soc Sci Med* 2008; **66**(10): 2,096–107.
15. Berman P. Community-based health programmes in Indonesia: the challenge of supporting a national expansion. In: Frankel S, ed. *The Community Health Worker: Effective Programmes for Developing Countries*. Oxford, England: Oxford University Press; 1992: 63–87.
16. Desai PB. Community health work: India's experience. In: Frankel S, ed. *The Community Health Worker: Effective Programmes for Developing Countries*. Oxford, England: Oxford University Press; 1992: 125–55.
17. Sanders D. The state and democratization in PHC: community participation and the village health worker programme in Zimbabwe. In: Frankel S, ed. *The Community Health Worker: Effective Programmes for Developing Countries*. Oxford, England: Oxford University Press; 1992: 178–219.

18. Heggenhougen HK, Magari FM. Community Health Workers in Tanzania. In: Frankel S, ed. *The Community Health Worker: Effective Programmes for Developing Countries*. Oxford, England: Oxford University Press; 1992: 156–77.
19. Coyle E, Smith GD, Sandiford P. The limits of participation in health: *brigidista* programmes in Nicaragua. In: Frankel S, ed. *The Community Health Worker: Effective Programmes for Developing Countries*. Oxford, England: Oxford University Press; 1992: 220–40.
20. Kendall C. The village context of Honduras' VHW programme: 1980-84. In: Frankel S, ed. *The Community Health Worker: Effective Programmes for Developing Countries*. Oxford, England: Oxford University Press; 1992: 241–60.
21. Berman PA, Gwatkin DR, Burger SE. Community-based health workers: head start or false start towards health for all? *Soc Sci Med* 1987; **25**(5): 443–59.
22. Walt G. CHWs: are national programmes in crisis? *Health Policy and Planning* 1988; **31**(1): 1–21.
23. Walt G, editor. *Community Health Workers in National Programmes: Just Another Pair of Hands?* Milton Keynes, UK: The Open University Press; 1990.
24. Segall M. District health systems in a neoliberal world: a review of five key policy areas. *Int J Health Plann Manage* 2003; **18 Suppl 1**: S5–26.
25. Hall J, Taylor R. Health for all beyond 2000: the demise of the Alma-Ata Declaration and primary health care in developing countries. *The Medical journal of Australia* 2003; **178**(1): 17–20.
26. Walsh JA, Warren KS. Selective primary health care: an interim strategy for disease control in developing countries. *N Engl J Med* 1979; **301**(18): 967–74.
27. Rice-Marquez N, Baker TD, Fischer C. The Community Health Worker: Forty Years of Experience in an Integrated Primary Rural Health Care System in Brazil. *Journal of Rural Health* 1998; **4**: 87–100.
28. Mayberry AL, Baker TD. Lessons from a Brazilian-U.S. cooperative health program: the servico especial de saude publica. *Public Health Rep* 2011; **126**(2): 276–82.
29. Cufino Svitone E, Garfield R, Vasconcelos MI, Araujo Craveiro V. Primary health care lessons from the northeast of Brazil: the Agentes de Saude Program. *Rev Panam Salud Publica* 2000; **7**(5): 293–302.
30. Paim J, Travassos C, Almeida C, Bahia L, Macinko J. The Brazilian health system: history, advances, and challenges. *Lancet* 2011; **377**(9,779): 1,778–97.
31. Starfield B. *Primary Care: Concept, Evaluation, and Policy*. New York: Oxford University Press; 1992.
32. Fleury S. Brazil's health-care reform: social movements and civil society. *Lancet* 2011; **377**(9,779): 1,724–5.
33. Macinko J, Guanais FC, de Fatima M, de Souza M. Evaluation of the impact of the Family Health Program on infant mortality in Brazil, 1990–2002. *Journal of epidemiology and community health* 2006; **60**(1): 13–9.
34. Victora CG, Aquino EM, do Carmo Leal M, Monteiro CA, Barros FC, Szwarcwald CL. Maternal and child health in Brazil: progress and challenges. *Lancet* 2011; **377**(9,780): 1,863–76.
35. Svitone EC, Garfield R, Vasconcelos MI, Craveiro VA. Primary health care lessons from the Northeast of Brazil: the Agentes de Saúde Program. *Rev Panam Salud Publica* 2000; **7**(5): 293–302.

36. Macinko J, Marinho de Souza Mde F, Guanais FC, da Silva Simoes CC. Going to scale with community-based primary care: an analysis of the family health program and infant mortality in Brazil, 1999–2004. *Soc Sci Med* 2007; **65**(10): 2070–80.
37. Zanchetta MS, McCrae Vander Voet S, Galhego-Garcia W, et al. Effectiveness of community health agents' actions in situations of social vulnerability. *Health Educ Res* 2009; **24**(2): 330–42.
38. Kluthcovsky AC, Takayanagui AM. Community health agent: a literature review. *Revista latino-americana de enfermagem* 2006; **14**(6): 957–63.
39. Jurberg C, Humphreys G. Brazil's march towards universal coverage. *Bull World Health Organ* 2010; **88**(9): 646–7.
40. Perry H. *Health for All in Bangladesh: Lessons in Primary Health Care for the Twenty-First Century*. Dhaka, Bangladesh: University Press Ltd; 2000.
41. Gottlieb J. Reducing child mortality with vitamin A in Nepal. In: Levine R, ed. *Case Studies in Global Health: Millions Saved*. Washington, D.C.: Center for Global Development; 2007: 25–31.
42. Thapa S, Choe MK, Retherford RD. Effects of vitamin A supplementation on child mortality: evidence from Nepal's 2001 Demographic and Health Survey. *Trop Med Int Health* 2005; **10**(8): 782–9.
43. Rohde J, Cousens S, Chopra M, et al. 30 years after Alma-Ata: has primary health care worked in countries? *Lancet* 2008; **372**(9,642): 950–61.
44. Bhutta ZA, Lassi ZS, Pariyo G, Huicho L. *Global Experience of Community Health Workers for Delivery of Health Related Millennium Development Goals: A Systematic Review, Country Case Studies, and Recommendation for Integration into National Health Systems*. Geneva: World Health Organization and the Global Health Workforce Alliance; 2010. Available at: http://www.who.int/workforcealliance/knowledge/publications/alliance/Global_CHW_web.pdf
45. Hafeez A, Mohamud BK, Shiekh MR, Shah SA, Jooma R. Lady health workers programme in Pakistan: challenges, achievements and the way forward. *JPMA The Journal of the Pakistan Medical Association* 2011; **61**(3): 210–5.
46. Oxford Policy Management. *Lady Health Worker Programme: Fourth External Evaluation for the National Programme for Family Planning and Primary Health Care- Quantitative Survey Report*, 2009. Available at: <http://www.opml.co.uk/projects/lady-health-worker-programme-third-party-evaluation-performance>.
47. Global Health Workforce Alliance Task Force and WHO. *Pakistan's Lady Health Worker Programme*. World Health Organization and Global Health Workforce Alliance; 2008.
48. Jalal S. The lady health worker program in Pakistan—a commentary. *European journal of public health* 2011; **21**(2): 143–4.
49. Bhutta ZA, Lassi ZS, Pariyo GW, Huicho L. *Global Experience of Community Health Workers for Delivery of Health-Related Millennium Development Goals: A Systematic Review, Country Case Studies, and Recommendations for Integration into National Health Systems*. In: WHO and Global Health Workforce Alliance, editor. Geneva; 2010.
50. Oxford Policy Management. *Lady Health Worker Programme: External Evaluation of the National Programme for Family Planning and Primary Health Care – Systems Review*, 2009. Available at: <http://www.opml.co.uk/projects/lady-health-worker-programme-third-party-evaluation-performance>.
51. Haq Z, Iqbal Z, Rahman A. Job stress among community health workers: a multi-method study from Pakistan. *International journal of mental health systems* 2008; **2**(1): 15.

52. Haq Z, Hafeez A. Knowledge and communication needs assessment of community health workers in a developing country: a qualitative study. *Human resources for health* 2009; **7**: 59.
53. Earth Institute. *One Million Community Health Workers: Task Force Report*. New York: Columbia University; 2011.
54. Ghebreyesus TA, Alemayehu T, Bosman A, Witten KH, Teklehaimanot A. Community participation in malaria control in Tigray region Ethiopia. *Acta Trop* 1996; **61**(2): 145–56.
55. Health Extension and Education Center. Health Extension Program in Ethiopia. In: Federal Ministry of Health, editor; 2007. Available at: <http://www.moh.gov.et/english/Resources/Documents/HEW%20profile%20Final%2008%2007.pdf>.
56. World Health Organization. *Ethiopia: Health Profile*. 2012. Available at: <http://www.who.int/gho/countries/eth.pdf>.
57. Gopinathan U, Lewin S, Glenton C. *An analysis of large-scale programmes for scaling up human resources for health in low- and middle-income countries*. 2012
58. Dynes M, Buffington ST, Carpenter M, et al. Strengthening maternal and newborn health in rural Ethiopia: Early results from frontline health worker community maternal and newborn health training. *Midwifery*; 2012.
59. Celletti F, Wright A, Palen J et al. Can the deployment of community health workers for the delivery of HIV services represent an effective and sustainable response to health workforce shortages? Results of a multicountry study. *AIDS* 2010; **24 Suppl 1**: S45–57.
60. Banteyerga H. Ethiopia's Health Extension Program: Improving Health through Community Involvement. *MEDICC Review* 2011; **13**(3).
61. Nsona H, Mtimuni A, Daelmans B, et al. Scaling up integrated community case management of childhood illness: update from Malawi. *Am J Trop Med Hyg* 2012; **87**(5 Suppl): 54–60.

