

Community Health Workers' Perspectives on Their Contribution to Rural Health and Well-Being in Iran

Sara Javanparast, MD, PhD, Fran Baum, PhD, FASSA, LMPHAA, Ronald Labonte, PhD, MA, FCAHS, and David Sanders, MBChB, DCH, MRCP, DTPH

During the past 3 decades, Iran has implemented significant changes in its health system structure and witnessed major improvements in the health status of its population. The World Health Organization adopted a primary health care approach to achieve its vision of “health for all by the year 2000,” and Iran built on its existing primary health care services to develop a more comprehensive network. Health system reform coincided with the Iranian revolution in 1979, which spawned enormous political change within the country as well as an 8-year war with Iraq that had a major impact on socioeconomic and health conditions in Iran (e.g., economic deficits, material destruction).

The new health system was based on comprehensive primary health care and also saw the integration of medical education and health care services beginning in 1984.¹ This integration occurred in response to health workforce shortages and aimed to improve the country's development of human resources for health and to match health personnel education to population health needs more effectively.

Many studies conducted within the past few decades indicate that Iran has made remarkable progress in a range of health indicators despite its revolution and ensuing war.²⁻⁴ Mortality rates among infants and children younger than 5 years decreased from 93 and 135 deaths per 1000 live births in 1974 to 28.6 and 36 deaths per 1000 live births in 2000, respectively.²⁻⁴ In addition, the maternal mortality ratio, recognized as a sensitive indicator of both development and health services,⁵ decreased sharply from 140 to 24 deaths per 100 000 live births between 1985 and 2007.⁶ Life expectancy increased from 55.7 years in 1976 to 71.6 years in 2003,⁶ and a trend analysis showed that Iran has been more successful than other countries in the Eastern Mediterranean region in improving health.²

A primary goal of primary health care in Iran was not only to improve population health nationwide, but also to narrow the rural–urban health gap. A study conducted by the Statistical

Objectives. The activities of community health workers (CHWs) have been identified as key to improvements in the health of Iran's rural population. We explored the perceptions of CHWs regarding their contribution to rural health in Iran.

Methods. Three research assistants familiar with the Iranian primary health care network conducted face-to-face interviews with CHWs in 18 provinces in Iran.

Results. Findings showed that Iranian CHWs have an in-depth understanding of health, including its social determinants, and are responsible for a wide range of activities. Respondents reported that trust-based relationships with rural communities, an altruistic motivation to serve rural people, and sound health knowledge and skills are the most important factors facilitating successful implementation of the CHW program in Iran. By contrast, high workload and the lack of a support system were mentioned as barriers to effective performance.

Conclusions. The CHW program in Iran is a compelling example of comprehensive primary health care, in that CHWs provide basic health care but also work with community members and other sectors to address the social determinants of health. (*Am J Public Health.* 2011;101:2287–2292. doi:10.2105/AJPH.2011.300355)

Center of Iran between 1973 and 1976 revealed a striking difference in infant mortality rates between rural (130 per 1000 births) and urban (13.9 per 1000 births) areas, attributable mainly to disparities in income, living standards, and access to basic health and social services.⁴ This gap closed dramatically after the establishment of the primary health care system in Iran with its special emphasis on the rural poor. In 1985, rural infant mortality was almost twice that in urban areas (71 vs 33 deaths per 1000 live births). This gap had narrowed by 1996 (30.2 infant deaths per 1000 live births in rural areas vs 27.7 in urban areas⁴), with rural infant mortality declining further to 23.7 deaths per 1000 live births in 2003.⁷

It is unlikely that these improvements were achieved through primary health care alone given that the period also saw economic growth, increased literacy rates, and improvements in environmental services such as access to safe water and sanitation. Moreover, the role of physicians, dentists, and other allied health workers in improving rural health and narrowing

the rural–urban health gap cannot be ignored. A particular feature of the primary health care reforms was refinement and expansion of a community health worker (CHW) program begun decades earlier.^{8,9} The expansion of the program was specifically intended to extend basic health services to underprivileged areas.

Iranian CHWs, called *behvarzes* in the Farsi language, are local health workers with specialized training in the health needs of the rural population. *Behvarzes* are selected from the rural areas where they live and are committed to reside in their area for at least 4 years after training. Nevertheless, some *behvarzes*, as a result of family concerns (e.g., their children's education and other living considerations), move and reside in urban areas close to the village where they work. To qualify as a *behvarz*, an individual must have a high school certificate and be approved by the rural council; also, they are interviewed and must pass a theory test.

The minimum requirements in terms of education have become considerably more stringent over time; thus, the current corps of

beharzes includes a mixture of less educated, longer-serving *beharzes* and better educated, more recently recruited workers. The 2-year *beharz* training period, which includes theory and practical classes as well as clinical placement in rural areas, covers a broad range of topics from health care services to communication skills and social determinants of health.

Beharzes are permanent employees of and paid by the Iranian health system. They work from village health houses, health delivery facilities located in rural areas. Each health house is designed to cover a target population of approximately 1500. According to the most recent statistics, in 2007 there were about 17 000 health houses in Iran, with almost 31 000 male and female *beharzes* working in these facilities, which cover most of the country's 65 000 villages.¹⁰

Despite evidence indicating the comprehensiveness of the CHW program in Iran,¹¹ there has been little research examining in detail the factors influencing CHW performance and overall program sustainability. We attempted to fill this gap by exploring CHWs' perceptions about their contribution to health gains in rural areas over the past few decades and examining facilitators of and barriers to the success of Iran's *beharz* program.

METHODS

We conducted a qualitative inquiry to document CHWs' perceptions of their role within rural communities and their contribution over time to health improvements. Study participants were selected from *beharzes* in 18 provinces in Iran. To allow inclusion of a broader range of participants, we compiled a profile of *beharzes* throughout the country that included information on the number and distribution of *beharzes* in each province and their gender, work experience, and educational level. We derived this information from the Division of Network Development and Health Promotion of the Iranian Ministry of Health, where all *beharz*-related information is stored at the national level. Figure 1 shows the provinces that were selected as study sites from different geographical locations in Iran.

Three research assistants familiar with the Iranian primary health care network and the *beharz* program were recruited and trained

to conduct face-to-face interviews with *beharzes*. Each research assistant traveled to 6 provinces (between October 2009 and February 2010) and conducted 5 interviews in each province. Interviews were conducted at health houses in rural areas or in district health centers depending on the preferences of the *beharzes*. The interviews varied from 1 hour to almost 2 hours in duration.

A total of 91 interviews were undertaken in the 18 study provinces. All interviews were conducted in Farsi. Although in some provinces, particularly in northwestern, western, and southern Iran, people speak in Turkish, Arabic, and Kurdish or their local languages, *beharzes* who participated in this study were able to speak in Farsi. Nevertheless, one of the research assistants was originally from a Turkish-speaking province and was specifically recruited to overcome potential language barriers in a few selected provinces.

Participants were asked questions concerning recruitment, training, tasks and responsibilities, support, and supervision. *Beharzes'* perceptions about barriers to effective program delivery and suggestions for improvement were also sought. Interviews were recorded with the consent of participants, and interview files were transcribed by the 3 research assistants. All audiotapes were checked against the transcribed text by the first author. Interview

data were coded to comparable categories generated according to key concepts derived from responses to the study questions. Because the transcripts were in the Farsi language, qualitative analysis software could not be used, and all data were categorized and coded manually. Key themes and illustrative quotations were translated into English by the first author.

RESULTS

Of the *beharzes*, 54 were women and 37 were men; most ($n=51$) were 30 to 39 years old. In addition, 91% were married, 69% had a secondary-level education, and 66% lived in a rural area.

Roles and Responsibilities

Whereas initially the *beharz* program focused primarily on infectious diseases and maternal and child health, changing disease profiles have expanded the range of *beharzes'* responsibilities. Participants were asked to report on the duties they perform during a normal week, and they mentioned a wide range of tasks and responsibilities (see box on next page).

The range and scope of these activities offer a good indication of the important contribution of *beharzes* to rural health in Iran. The *beharzes* also ranked their tasks and



FIGURE 1—The 18 provinces serving as study sites: Iran, 2009–2010.

Roles and Responsibilities of Behvarzes: Iran, 2009–2010

Role	Responsibilities
Child health care	Vaccination, growth monitoring, integrated management of childhood illness, breastfeeding promotion and education, supplementary feeding
Maternal health care	Prenatal, natal, and postnatal care; health education and delivery; family planning
Communicable disease management	Detection, management, follow-up, and referral of cases of diarrheal disease and acute respiratory disease in children and tuberculosis, malaria, hepatitis, and AIDS in all age groups
Noncommunicable disease management	Detection, management, follow-up, and referral of cases of diabetes, hypertension, mental disorders, goiters, accidents and injuries, asthma, thalassemia, and anemia
Care of the elderly	Promotion of healthy eating and physical activity
Oral health care	Dental screening of children, pregnant women, and elderly individuals and referral to dentists or dental assistants in rural health centers
Care of young people	Provision of health education, promotion of healthy eating, prevention of addiction
Health care in schools	Regular visits to schools, physical examinations of students on an annual basis
Environmental health	Food safety via regular supervision of food production, storage, and distribution; monitoring of sanitation and safe water; collaboration with other sectors in environmental health projects and home visits
Occupational health	Farmers' health, health education, work safety
Simple symptomatic treatment and first aid	Provision (as applicable) of painkillers, antibiotics, and supplements
Annual population census	Updates of rural household profiles
Completion of reports/forms	Filling in forms, writing reports, collecting data
Meeting attendance	Participation in in-service training sessions, <i>behvarz</i> councils, etc.

responsibilities according to importance, workload, and time spent on each. Health education, maternal and child health, and environmental health were reported as the most time-consuming areas of responsibility. For example:

Mothers and children are the most important target groups, so the time we spend for their health care is the most. (female *behvarz*, 44 years old)

Health education is included in all other programs, so the time we spend on it is very high. (female *behvarz*, 38 years old)

I spend most of my time on environmental health, follow-ups, and occupational health care. (male *behvarz*, 44 years old)

Gender and Task Allocation

Our results revealed that although the *behvarz* program does not include any specific gender-related policies, in practice task allocation appears to be strongly influenced by cultural and religious beliefs such that, for example, care for women is provided by female

health workers. Female *behvarzes* are generally responsible for tasks performed within the health house, such as providing care to mothers and children and recording data, whereas male *behvarzes* deal with activities outside the health house. These activities include following up cases of communicable diseases, performing environmental health checks (e.g., assessing the chloride level of drinking water in rural households, ensuring hygienic toilets, negotiating with other sectors for the collection of domestic waste), and engaging in occupational health activities such as implementing food safety programs.

Our male *behvarz* does all the environmental and occupational health, so I don't spend too much time on that. It is easier for them to do the duties outside the health house. (female *behvarz*, 42 years old)

Women prefer to be served by [me]. When a woman comes for family planning services or prenatal care and I'm not in she leaves the health house and won't talk to our male *behvarz*. I think they feel more comfortable with me. (female *behvarz*, 43 years old)

We did not have [a] female *behvarz* for 4 years and during that period of time pregnant women did not come for their prenatal care in spite of my follow-ups. . . . It's a cultural thing that they feel embarrassed to talk to me about these issues. (male *behvarz*, 44 years old)

Apart from the roles clearly identified in the *behvarz* program, other tasks are performed that are not recognized by the health authorities but that the *behvarzes* strongly believe are crucial in building relationships with members of their rural community and improving program effectiveness. These tasks include attending social events in the rural area, consulting with religious leaders and other trusted people, and cleaning the health house. Two of the *behvarzes* conveyed the importance of such activities:

We take [advantage] of every single opportunity to convey health messages to people so we must attend different social events like religious events or ceremonies, etc. I believe it is part of our job. . . . Or sometimes I've got an old lady coming to check her blood pressure, she wants to sit and chat with me for hours, I have to listen to her. . . . I can't stop her because I have other duties to do. I have to respect her so she respects me back. (male *behvarz*, 38 years old)

There are also other things that we do [that] are not recognized by program planners but. . . take [a] huge amount of our time, like cleaning the health house every day. (male *behvarz*, 34 years old)

Behvarzes demonstrated a broad understanding of health, including social determinants of health, even if they did not always have time to address the social factors affecting people's life and health.

Almost all of the respondents placed a special emphasis on health education as their principal role and what they saw as the most important factor influencing rural health. This was followed by environmental health interventions that addressed basic determinants of health related to sanitation, potable water, road safety, and other physical risks. For example:

Health education is the most important thing we do because people's awareness would increase and this is what we aim for. (male *behvarz*, 34 years old)

All these changes that you see in [the] rural environment are the result of health education provided by us. People's beliefs and behavior changed a lot and it makes everything easier for us. (male *behvarz*, 46 years old)

Perceptions About Contributions to Rural Health

There was a general consensus that *behvarzes* have made a significant contribution to rural health improvements over the past few decades. A majority of *behvarzes*, particularly older *behvarzes* who have been serving the community for many years, provided comparative information on major health indicators and how these indicators had improved as a result of their work in rural areas.

I remember many years ago we had to go to people's house and talk for at least 1 hour to do vaccination[s] for their children, but now they follow up [their] child's vaccination themselves. We don't need to contact them anymore. It all shows that they've become much more sensitive to health issues, and it all happened due to our consistent education. (male *behvarz*, 40 years old)

In the past people believed that they should have 10 children, but now you rarely see a family with more than 2 to 3 children. It's all the result of our hard work on family planning program[s] and health education. (female *behvarz*, 49 years old)

When I started my job about 20 years ago maternal mortality was very high, but now we have no maternal death[s]. Our prenatal care and health education for pregnant women have been very useful. There is [a] similar trend for the infant and under 5 mortality rates. (male *behvarz*, 38 years old)

Our respondents also believed that their environmental health efforts in the areas of sanitation, safe water, food safety, and waste collection, in collaboration with other sectors, have had a significant impact in reducing rates of infectious disease over time. According to one of the respondents:

I believe that what we have done in the area of environmental health is the most effective intervention. . . . Now domestic waste is collected on [a] daily basis, you can't see animal waste in rural area[s] anymore, and as a result the rate of diarrheal and other infectious diseases declined a lot. (male *behvarz*, 44 years old)

Factors Enhancing Performance

Respondents identified some of the factors that facilitate successful implementation of the *behvarz* program in rural areas. Examples included the building of lasting and sustainable relationships with communities based on trust and recognition, the *behvarzes*' strong motivation to serve rural people, and their high level of health knowledge and skills.

Being from this area helps me a lot. I know my people very well. People trust me, which is very important. (male *behvarz*, 40 years old)

If a specialist prescribes a medicine for somebody here, he won't take the medicine unless he consults with me first, even though I don't know what it is for. . . . This is an example of how people trust me. (female *behvarz*, 44 years old)

Our training courses are very comprehensive, so having knowledge and skills gives us enough confidence to work easily. (male *behvarz*, 31 years old)

Some of the respondents noted the crucial role of higher level health managers and the program's incentive system in facilitating their performance.

Barriers to Performance

Workload, lack of a support system, and poor supervisory mechanisms were the most common barriers cited by respondents as impediments to effective implementation of the *behvarz* program in Iran. A majority of the participants viewed their heavy and increasing workload as a threat to their ability to provide high-quality health services. Integration of new programs within the Iranian primary health care system and the inclusion of additional forms and paperwork—leading to duplication—were frequently cited. For example:

To be honest, we spend most of our time in filling [out] the forms and recording statistics. We have to record a child's injection in too many forms, which wastes our time. (male *behvarz*, 46 years old)

Every single unit in [the] health department expects *behvarz[es]* to do a set of tasks. They don't even think of the scope of activities we have to do, and they don't care about our problems. (female *behvarz*, 31 years old)

The variety of tasks makes us confused and tired. . . . besides on the top of all these tasks other sectors expect us to help them in their projects because we are the only person who knows everybody in the village very well. Like last year we [spent] too much time on collecting data for [a health-related organization], with no payment. (male *behvarz*, 36 years old)

Other common challenges cited by *behvarzes* included insufficient support systems (e.g., lack of physical space and health house maintenance) and incentives and a lack of recognition by higher authorities. Most of the *behvarzes* believed that they are not fully supported by the health system. According to one respondent:

We don't have enough space and educational materials in our health house for the educational classes. Sometimes I have to pay out of my own pocket for maintenance of [the] health house. (female *behvarz*, 43 years old)

Despite formal supervisory mechanisms being in place, poor-quality supervision was one of the barriers reported by *behvarzes*. In most cases, supervisory teams do not provide sufficient technical and emotional support or training. Instead, a large number of our respondents stated that supervisors mainly focus on their weaknesses rather than their strengths.

Supervisors should provide advice and support, but they only reflect our weak points. They haven't solved my problem at all. (female *behvarz*, 28 years old)

We have supervisors from different units; everybody expect[s] us to do best in their area of interest. Nobody consider[s] our high workload and our expectations. (male *behvarz*, 28 years old)

The box on the next page shows examples of other barriers reported by *behvarzes*.

DISCUSSION

CHWs are part of the systematic primary health care strategy in Iran. Selection of Iranian CHWs from the communities they serve enhanced equity not only in access to health care services but also in practical implementation of community participation efforts. Experiences from other countries as well have shown that CHWs recruited from local communities create better health awareness and improved health outcomes.¹²⁻¹⁴

The comprehensive initial and continued training they receive allows *behvarzes* to be responsive to their communities' needs. The recruitment and training of CHWs have received considerable attention in many countries.^{12,15,16} Iran's experience shows that CHWs receive comprehensive training and are recognized and rewarded for their skills and knowledge of primary health care.

This study, however, highlights some obstacles to the functioning of CHWs. The most serious problems concern support services, supervision, and workload. The amount of time *behvarzes* spend in meeting cultural expectations, crucial in building trust and community engagement, does not appear to be sufficiently

Perceived Barriers to Behvarzes' Performance: Iran, 2009–2010

Barrier	Example
Lack of educational opportunities	"I have started my job with [a] high school certificate but now I have to get unpaid leave to be able to continue my education at university level. Due to the financial problem this is not possible for me." (male <i>behvarz</i> , 27 years old)
Lack of facilities and poor maintenance	"It is about 1 year that the health house's window is broken, the fridge doesn't work properly and hasn't been fixed yet, our sphygmomanometer is broken. I have followed these up. . . many times with no success." (female <i>behvarz</i> , 38 years old)
Job stress and mental health issues	"Job stress is too high. Nobody cares about our mental health." (female <i>behvarz</i> , 28 years old)
Lack of mechanisms for job promotion	"There is no opportunity for job promotion. After 30 years we are treated the same as a new employed <i>behvarz</i> ." (male <i>behvarz</i> , 34 years old)
Shortage of workers	"We have been told that the standard number is 2 <i>behvarzes</i> per 1500 population, but there is 3000 population in our village and we are only 2 <i>behvarzes</i> . It doubles our workload." (female <i>behvarz</i> , 32 years old)

appreciated by the health system. An abundance of duplicative paperwork suggests the need for a comprehensive review of health program reporting processes.

The crucial role of effective supervision and support in the success of CHW programs and maintaining the motivation of CHWs has been widely acknowledged.^{17,18} Our findings suggest that supervision-related mechanisms (e.g., how supervisors can support *behvarzes* to improve their performance) require attention on the part of health authorities to avoid what could be early signals of dissatisfaction.

Limitations

This study involved some limitations. For example, we were able to speak with only 91 *behvarzes* (out of the almost 31000 *behvarzes* working in Iran), and so our results are not necessarily representative. Also, we did not speak to community members about their experiences with *behvarzes*, which could have helped us focus more on specific strengths and weaknesses of the program with respect to achieving the goals of comprehensive primary health care. It would be useful for future research to add community perspectives to the picture.

Conclusions

The CHW program in Iran is a compelling example of comprehensive primary health care, in that *behvarzes* provide basic health

services but also work with community members and other sectors to address the social determinants of health. The *behvarzes* were clear in their belief that the work they have done over the past 3 decades has made a significant contribution to improving the health of Iran's rural population. The breadth of the tasks they perform demonstrates the important role they play in the country's comprehensive primary health care system. Lessons learned from this study, including those related to training, program enhancement, and the forging of relationships with community members, may be applicable to programs in other countries seeking to improve the retention and performance of community-level health workers. ■

About the Authors

Sara Javanparast is with the South Australian Community Health Research Unit (SACHRU), Flinders University, Adelaide, South Australia. Fran Baum is with the Southgate Institute for Health, Society and Equity, Flinders University. Ronald Labonte is with the Institute of Population Health and the Department of Epidemiology and Community Medicine, University of Ottawa, Ottawa, Ontario, Canada. David Sanders is with the School of Public Health, University of Western Cape, Cape Town, South Africa. Correspondence should be sent to Sara Javanparast, MD, PhD, Level 2, Discipline of Public Health, Health Science Building, North Ridge Precinct, Registry Road, Flinders University, Adelaide, South Australia 5042 (e-mail: sara.javanparast@flinder.edu.au). Reprints can be ordered at <http://www.ajph.org> by clicking the "Reprints/Eprints" link. This article was accepted June 30, 2011.

Contributors

S. Javanparast designed the study, supervised its implementation, analyzed the data, and led the preparation of the article. F. Baum provided mentoring in the implementation of the study and assisted in the preparation of the article. R. Labonte and D. Sanders provided advice in the implementation of the study and assisted in the preparation of the article.

Acknowledgments

This work was carried out with support from the Global Health Research Initiative, a collaborative research funding partnership of the Canadian Institutes of Health Research, the Canadian International Development Agency, Health Canada, the International Development Research Centre, and the Public Health Agency of Canada.

We gratefully acknowledge the research team in Iran—Gholamreza Heidari, Sakineh Rezaei, Zohreh Rajabi, Mohammad Bazyari, and Javad Farahi Shahgoli—for their assistance in the implementation of the study and the collection of data. We also acknowledge the participation of the Iranian community health workers who gave so generously of their time and shared their wonderful experiences and views with our research team.

Human Participant Protection

This study was approved by the institutional review boards of Flinders University in Australia and the Boushehr University of Medical Sciences in Iran. Written informed consent was obtained from all study participants.

References

1. Khojasteh A, Montazmanesh N, Entezari A, Einollahi B. Integration of medical education and healthcare service. *Iran J Public Health*. 2009;38(suppl 1):29–31.
2. Movahedi M, Haghdoost AA, Pournik O, Hajarizadeh B, Fallah MS. Temporal variation of health indicators in Iran comparing with other Eastern Mediterranean region countries in the last two decades. *J Public Health (Oxf)*. 2008;30(4):499–504.
3. Mehryar A. Primary health care and the rural poor in the Islamic Republic of Iran. Available at: <http://info.worldbank.org/etools/docs/reducingpoverty/case/22/fullcase/iran%20rural%20healthcare%20full%20case.pdf>. Accessed August 14, 2011.
4. Mehryar AH, Aghajanian A, Ahmad-Nia S, Mirzae M, Naghavi M. Primary health care system, narrowing of rural-urban gap in health indicators, and rural poverty reduction: the experience of Iran. Paper presented at: XXV General Population Conference of the International Union for the Scientific Study of Population, July 18–23, 2005, Tours, France.
5. Currey B. Maternal mortality and mothers' deaths as development indicators. *BMJ*. 2000;321(7264):835.
6. Naghavi M. Transition in health status in Islamic Republic of Iran. *Iranian J Epidemiol*. 2006;1(3):13–25.
7. *Health Profile in Rural Areas, Iran 1993–2003*. Tehran, Iran. Ministry of Health and Medical Education; 2005.
8. Amini F, Barzgar M, Khosroshahi A, Leyliabadi G. *An Iranian Experience in Primary Health Care: The West*

Azerbaijan Project. New York, NY: Oxford University Press; 1983.

9. Ronaghy HA, Mehrabanpour J, Zeighami B, et al. The middle level auxiliary health worker school: the Behdar project. *J Trop Pediatr*. 1983;29(5):260–264.

10. *The Total Number of Behvarzes, Behvarz Training Centres and District Health Centres in Iran*. Tehran, Iran. Ministry of Health and Medical Education; 2008.

11. Javanparast S, Baum F, Labonte R, Sanders D, Heidari G, Rezaie S. A policy review of the community health worker programme in Iran. *J Public Health Policy*. 2011;32:263–276.

12. Abbatt F. *Scaling Up Health and Education Workers: Community Health Workers*. London, England: DFID Health Systems Resource Centre; 2005.

13. Lewin S, Dick J, Pond P, Zwarenstein M, Aja G, Wyk B. Lay health workers in primary and community health care. *Cochrane Database Syst Rev*. 2011;(8):CD004015.

14. Rosato M, Laverack G, Grabman LH, et al. Community participation: lessons for maternal, newborn, and child health. *Lancet*. 2008;372(9642):962–971.

15. Campos F, Ferreira J, Souza M, Aguiar R. Innovations in human resources development: the role of community health workers. Available at: <http://www.hiv411.org/files/File/2011/health%20agent%20article%20202.pdf>. Accessed August 14, 2011.

16. Sanders D, Lehmann U. *Community Health Workers: What Do We Know About Them? The State of the Evidence on Programmes, Activities, Costs and Impact on Health Outcomes of Using Community Health Workers*. Geneva, Switzerland: World Health Organization; 2007.

17. Gray H, Ciroma J. Reducing attrition among village health worker programs in rural Nigeria. *Socioecon Plann Sci*. 1988;22(1):39–43.

18. Ofori-Amaah V. *National Experience in the Use of Community Health Workers: A Review of Current Issues and Problems*. Geneva, Switzerland: World Health Organization; 1983.