



Published in final edited form as:

*Health Aff (Millwood)*. 2012 January ; 31(1): 130–139. doi:10.1377/hlthaff.2011.0914.

## Peer Support For Self-Management Of Diabetes Improved Outcomes In International Settings

**Edwin B. Fisher, PhD,**

Progress Program Development Center, University of North Carolina at Chapel Hill

**Renée I. Boothroyd, PhD, MA, MPH, CHES,**

Progress Program Development Center, University of North Carolina at Chapel Hill

**Maggy Muchieh Coufal, MA, MPH,**

Progress Program Development Center, University of North Carolina at Chapel Hill

**Linda Baumann, PhD, APRN, BC, FAAN,**

University of Wisconsin-Madison School of Nursing with Department of Medicine, Mulago Hospital, Uganda

**Jean Claude Mbanya, MD, PhD, FRCP,**

Health of Population in Transition Research Group, Department of Internal Medicine and Specialities, University of Yaoundé I, Cameroon

**Mary Jane Rotheram-Borus, PhD,**

University of California Los Angeles, Global Center for Children and Families with the University of Western Cape and Women for Peace, South Africa

**Boosaba Sanguanprasit, PhD, MPH, and**

Mahidol University, Thailand

**Chanuantong Tanasugarn, DrPH, MPH**

Mahidol University, Thailand

### Abstract

Self-management of diabetes is essential to reducing the risks of associated disabilities. But effective self-management is often short-lived. Peers can provide the kind of ongoing support that is needed for sustained self-management of diabetes. In this context, peers are nonprofessionals who have diabetes or close familiarity with its management. Key functions of effective peer support include assistance in daily management, social and emotional support, linkage to clinical care, and ongoing availability of support. Using these four functions as a template of peer support, project teams in Cameroon, South Africa, Thailand, and Uganda developed and then evaluated peer support interventions for adults with diabetes. Our initial assessment found improvements in symptom management, diet, blood pressure, body mass index, and blood sugar levels for many of those taking part in the programs. For policy makers, the broader message is that by emphasizing the four key peer support functions, diabetes management programs can be successfully introduced across varied cultural settings and within diverse health systems.

---

Peer support may help people with diabetes effectively manage and reduce risks associated with their disease. Even if those with diabetes spend six hours a year in a health care

provider's office, that still leaves more than 8,760 hours a year when they are on their own. Major guidelines distinguish between diabetes self-management education, the results of which often have deteriorated by the time of a six-month follow-up visit, and diabetes self-management support to "assist the individual...to implement and sustain the ongoing behaviors needed to manage their illness."<sup>1</sup>

Research demonstrates that nonprofessionals can contribute to diabetes self-management support<sup>2-5</sup> and can lead self-management groups.<sup>6</sup> These nonprofessionals are known by various names—including community health workers, *promotores de salud*, and lay health advisers. Although peer support is endorsed by a great deal of research<sup>7-13</sup> and peer support programs are widespread, they have not been routinely evaluated or systematically adopted in many health care systems.

Also posing a challenge to systematic adoption is a lack of standardization in definitions of peer support.<sup>14</sup> Identifying key functions of peer support could provide a template for global standardization and, at the same time, encourage flexibility in implementation and tailoring to meet local needs.<sup>15</sup> Among key functions that can be identified and evaluated are assistance in daily management of diabetes; social and emotional support to encourage the management of behavior and help patients cope with negative emotions; linkage to clinical care and community resources; and ongoing support, which is necessary because diabetes is a chronic disease.<sup>15</sup>

Peer support projects for diabetes management that illustrate the application of these key functions were developed in Cameroon, South Africa, Thailand, and Uganda as part of Peers for Progress, a program of the American Academy of Family Physicians Foundation.<sup>14,16</sup> Peers for Progress has focused on diabetes because of its increasing global burden and because it serves as an excellent model for the many challenges associated with managing and preventing chronic disease. The program funded these projects to build the evidence base for peer support and develop models of how peer support programs might be implemented in varied settings.

Peers for Progress selected these four projects from more than a hundred applications in the fall of 2008 after a competitive review process. Online Appendix 1 contains details of participant samples and timelines for each of the four projects, and online Appendix 2 describes the details of training of the peer supporters.

In each country, individual project teams developed the interventions to meet the needs of local populations and take advantage of the particular strengths in their settings and local health organizations. Peers for Progress provided information on resources and methods and other technical assistance through periodic reviews. The program also encouraged networking and knowledge exchange among the four projects to improve their overall quality.

The four projects' self-evaluations documented both the feasibility and early impacts of peer support, as well as how each project adapted the template of key functions to its own unique population, health care system, and organizational setting.

## Project Settings And Program Development

### Cameroon

The peer support project in Cameroon's capital, Yaoundé, was a joint project of Yaoundé Central Hospital, the National Obesity Centre, and the Medical School of the University of Yaoundé and based in the diabetes clinic of the National Obesity Centre. The project began in August 2009 and ran through January 2010. It sought to take advantage of naturally occurring social connections and recruited both peer supporters and participants with diabetes through existing social networks based on tribe or clan, profession, religion or church membership, residential quarter, or sport group.

Fifteen patients entered training to become peer supporters. The project chose the best ten to become supporters, with each serving a group of ten participants. Peer supporters met monthly with their groups of participants to discuss self-care activities. Additionally, individual contacts were frequent: Peer supporters made at least three planned face-to-face visits and two unplanned visits each month to each participant. Participants also frequently contacted peer supporters by telephone, and supporters routinely followed these calls with a home visit.

### South Africa

Diabetes Buddies was designed to promote diabetes management through reciprocal support among women in the township of Mfuleni, in Cape Town, South Africa. The project was collaboratively developed by researchers and staff members from the University of California; the University of Western Cape; and Women for Peace, a nongovernmental organization in Cape Town. It ran for three months, from February through May 2010.

The project's development was informed by a 2007 study of food diaries from township women. The diaries indicated that the average woman ate 4.7 times daily while away from home, usually consuming carbohydrates.

Group leaders developed a twelve-session curriculum, adapted and translated from existing curricula based on feedback from local women, providers, and nurses. Twenty-two women participated, and all provided and received support from each other. Weekly sessions included a shared meal and a discussion of nutrition, exercise, and disease self-management and their application in daily life; successes in exercise and healthy eating; managing negative emotions; and role-playing strategies for coping with stress.

In addition, pairs of participants used mobile phones to call and text each other. The project sent daily texts to provide nutrition guidance and to prompt participants to walk or get other exercise. A central computer documented these contacts.

### Thailand

As part of the Thai national health system since 1978, 800,000 village health volunteers link communities with health care providers and offer a range of services, including assistance and outreach to individuals and community resource development. This project developed

and tested a curriculum to increase the volunteers' ability to improve diabetes management.<sup>17</sup>

Surveys and focus groups with 400 patients and 200 volunteers guided curriculum development. The project was implemented in two provinces, urban Nakorn Rajasima and rural Supan Buri. It began in June 2010 and continued through December of the same year.

Forty village health volunteers completed training. They then worked with staff members from village health centers to organize meetings of patients with type 2 diabetes to inform them about the project. Each of the forty volunteers recruited at least three village residents with diabetes.

One week after baseline assessments, participants attended a one-day diabetes camp (in Thai, khai bao-wan), at which the village health volunteers and health center staff provided an overview of diabetes self-management. With a patient handbook as a resource, subsequent village health volunteer contacts included helping participants set and revise goals, develop concrete plans, and assess their progress.

In urban Nakorn Rajasima, weekly small-group discussions and individual volunteers' visits were followed by monthly visits by a volunteer and a health center staff member. In rural Supan Buri, group activities included daily exercise sessions and biweekly to monthly discussions of self-management among patients, village health volunteers, and health center staff. Volunteers also visited patients individually every two weeks, or as needed.

Volunteers integrated the services delivered to groups and individuals with community-level efforts to develop resources to facilitate diabetes management. For example, in rural Supan Buri, one village developed a community garden, then hooked up an old bicycle to drive a generator and pump to irrigate the garden. The bicycle was also used as an exercise bicycle for participants who wanted to increase their physical activity.

## Uganda

Diabetes Champions was developed through the diabetes clinic of Mityana District Hospital, about fifty miles west of Kampala. The project ran from June through August 2009. In it, peer "champions" were to provide support to "partners." As in the South African case, this project emphasized both mobile phone and face-to-face contact. There were forty-six participants.

Partners received the same diabetes self-management education as champions, except that champions also received a communications module. The project developed a bilingual (in English and Luganda) training booklet organized according to the AADE7 Self-Care Behaviors—for example, healthy eating, being active, and taking medication—of the American Association of Diabetes Educators;<sup>18</sup> instructions on completing diaries of diet, exercise, and medication use; and guidelines for when to contact health care providers. During the project, the clinic staff also offered two "booster" meetings that reviewed material from the earlier educational classes, including ways in which champions and partners could support each other.

At the conclusion of the diabetes self-management education, each champion was matched with one or two partners and, along with diabetes clinic staff, given mobile phones that were linked in a prepaid network. Champions and partners agreed to make contact with each other at least weekly by telephone or in person. They also kept logs of the content of these calls in booklets provided by the project.

The logs revealed several main themes: healthy eating, taking medication consistently instead of only when feeling ill, increased exercise, and emotional well-being and support. The distinction between champions and partners gradually diminished, and support between them became reciprocal.

## Study Results

The demonstration projects described here were evaluated in terms of their implementation, reach, engagement of and acceptance among intended audiences, initial impact on intended clinical and behavioral outcomes, and sustainability.<sup>19,20</sup> This was done to assess their potential scalability and their appeal to the people they were intended to help, as well as to assess the value of the four functions as a template for future program development.

### Implementation

Peers for Progress documented the implementation of these projects through the lens of the four key functions of peer support—assistance in daily management of diabetes, provision of social and emotional support, facilitating linkages to clinical care, and ongoing availability of support—to measure their value as models for local tailoring of standards. Exhibit 1 summarizes how the projects addressed each of these functions.

**Assistance in Daily Management**—All four projects included individual and group meetings that emphasized “pragmatic” aspects of diabetes management. In Cameroon, for example, participants cooked meals in a group to learn healthier cooking methods and experience directly the fact that healthy food can be tasty and enjoyable. Peer supporters’ discussions with individuals also addressed specific ways in which they might overcome barriers to implementing their daily self-management.

Telehealth also contributed to peer support. Texting and telephone contacts among participants in South Africa and Uganda and automated text prompts in South Africa encouraged disease management. Peer supporters also helped provide community resources that encouraged daily self-management. For example, in Thailand the converted bicycle that powered irrigation for the community garden gave people with diabetes an opportunity for exercise.

**Social and Emotional Support**—Group and individual contacts provided opportunities for encouragement and attention to emotional and motivational issues surrounding diabetes management. Aspects of social and emotional support were among the skills emphasized during training of peer supporters (online Appendix 2).

In Cameroon, peer supporters provided opportunities to discuss emotions such as depression and concerns about complications that participants felt uncomfortable raising with health care professionals or in group sessions. In both South Africa and Uganda, text messaging and telephone contacts were seen to be effective channels not only for prompting self-management but also for exchanging encouragement and emotional support among participants. In addition to providing an overview of self-management, the one-day diabetes camp in Thailand gave village health volunteers and participants the networking skills needed to engage in subsequent social and emotional support.

**Linkage to Clinical Care**—All four projects encouraged participants to obtain appropriate clinical care and connected peer support personnel with health care professionals. In Cameroon and Uganda, the projects were based in diabetes care settings, so peer supporters found it easy to facilitate patients' receiving appropriate care, help arrange appointments, or accompany patients in visits to clinical providers. In Thailand, village health volunteers worked out of community health centers and regularly interacted with professional staff. In South Africa, participants were recruited through health clinics and encouraged to obtain appropriate care. In Uganda, the prepaid mobile phone network linking participants to each other also linked them to nurses in the health center, whom they were encouraged to call with questions about disease management.

Health professionals helped lead some intervention components in Thailand and Uganda. Instead of diluting the peer aspect of interventions, the involvement of professionals reduced peer supporters' anxiety about making mistakes and increased the projects' credibility. In Thailand, for example, health center staff reinforced advice that participants received from village health volunteers, alleviating any skepticism. In differentiating the roles of peer supporters and professionals, the project in Cameroon emphasized the distinctive, complementary role of peers in linking patients to appropriate clinical care.

**Ongoing Availability of Support**—All four projects developed interventions that could be continued on an ongoing basis. For example, flexible and convenient meeting times were features of the peer support system in Cameroon that were intended to increase its long-term attractiveness to participants. In Thailand, the long history—spanning more than thirty years—of the village health volunteers helped ensure the program's long-term stability, and the introduction of telephone networking and messaging added a convenience factor to peer support in South Africa and Uganda.

Patient education programs are often designed to have clear ending dates, after which participants are expected to maintain improvements without further support from the program. In contrast, each of the four diabetes projects described here was established in a way that permitted further evolution and that was intended to assist participants indefinitely.

### **Reach, Engagement, And Acceptance**

Across all four diabetes projects, both initial and sustained engagement in training and intervention were substantial. In Cameroon, 96 of the 100 patients who were offered admission completed the project. Of the remainder, one refused to participate, one moved away, and two died.

In South Africa, participants in Diabetes Buddies texted their buddies approximately five times weekly and responded to 54% of daily automated text messages. In Uganda, 89% of the 46 patients who entered the project attended an evaluation meeting four months later; five patients did not attend because of failing health or employment duties. Automated electronic phone records showed that 68% of the participants made a phone contact with a peer at least weekly and that none of them had fewer than six contacts with a peer during the intervention period. Eighty-seven percent (40 patients) reported using mobile phones, and 61% (28 patients) reported making personal contact with peers.

### Impact On Clinical And Behavioral Outcomes

During the six-month project in Cameroon, significant decreases were observed in the participants' average body mass index (from 28.6 to 25.5 kg/m<sup>2</sup>) and their systolic (from 142 to 124.4 mmHg) and diastolic (from 84.4 to 77.7 mmHg) blood pressure.

Participants' average glycosylated hemoglobin (HbA1c) declined markedly, from 9.6% to 6.7%. The HbA1c blood test measures the average amount of sugar in the bloodstream for the prior three months. It is commonly used to gauge the effectiveness of medication, diet, and exercise in patients with diabetes. A score of 5.7% or less is considered normal. Before the project, eighty-five of the ninety-six participants had HbA1c greater than 8%. After the project, only four were still above 8%, and sixty-five were below 7.0%—a score that indicates good control of blood glucose.

In Thailand, gathering of data for evaluation purposes was complicated by logistical problems and participants' frequent unavailability. Nevertheless, baseline (June 2010) and postintervention (December 2010) data were available for fifty-three adults with type 2 diabetes. This sample was 79.2% female and had a mean age of 59.87 years—ranging from 32 to 75.

Multivariate analysis of changes in body mass index and HbA1c was statistically significant (Pillai's Trace  $F = 4.469$ ;  $p = 0.01$ ). For the univariate tests, the decline in average HbA1c, from 8.643% to 7.907%, was significant ( $p = 0.027$ ), and the decline in body mass index, from 26.66 to 25.17, was of borderline significance ( $p = 0.07$ ). Survey data showed that participants' diets had become healthier and that they were doing better on measures of exercise and self-efficacy, as well as on the short form of the World Health Organization Quality of Life instrument.<sup>21</sup>

Questionnaire responses from participants in the Uganda project indicated improvement in dietary behavior. The participants' average diastolic blood pressure dropped from 85.39 to 76.27 mmHg, and average HbA1c declined from 11.1% to 8.3%. The number of participants with HbA1c values less than 7% nearly doubled, from 17% to 32%. Final evaluation feedback from participants indicated that they perceived that care received from clinic staff members had improved. This might encourage patients to become more engaged in their own clinical care in the future.

## Sustainability

Following the end of the initial twelve sessions of Diabetes Buddies in South Africa, participants continued to meet weekly, expanding their numbers. Women for Peace, the local nongovernmental organization that coordinated the project's implementation, has obtained additional funding to continue it. Women for Peace is also partnering with other nongovernmental organizations and with academic and software development organizations in the region to continue to strengthen its peer support projects, which address a number of needs that women have.

The village health volunteers in Thailand provide a framework for institutionalizing the peer support project so that it reaches a large portion of the population.<sup>17</sup> Circumstances in Thailand provided unusual evidence of the project's sustainability. In spite of political unrest, flooding, and an outbreak of dengue fever, the volunteers persisted and adjusted how they provided support as needed. For example, when some volunteers were called away to areas of special need, others developed plans for taking turns to visit diabetes patients and communicate with patients by mobile phones.

In Uganda, modest funds from the rural diabetes clinic enabled the project to build a covered porch with benches where participants could meet for group education sessions and with clinic staff. The development of the bilingual diabetes self-care training booklet encouraged continued activities. For example, one woman reported that possessing this booklet had made her a village resource: People with diabetes visited her to gain information from it.

## Discussion

In Thailand and three countries in sub-Saharan Africa, peer support projects for people with diabetes proved to be feasible; successful in reaching and engaging their intended audiences; effective in changing key health behavior; and, in three of the four, improving key clinical measures and patients' quality of life. Consistencies among the projects emerged, showing that the four functions—assistance in daily management, social and emotional support, linkage to clinical care, and ongoing availability of support—provide a structure for standardization and program development that is also adaptable to local circumstances and audiences.

Each project addressed these functions, but each did so in ways that reflected its own setting and the population it served. For example, the project in Cameroon addressed cultural concerns, such as including a family member or friend in home visits with Muslim patients. As noted above, the project in Thailand placed somewhat greater emphasis on small-group and individual support in urban settings, relative to greater emphasis on group activities such as daily exercise sessions and general monthly discussions of self-management in smaller, rural villages.

In South Africa, women were determined to figure out why they had diabetes, often attributing their disease to having committed a sin or having been victimized by witchcraft. Their coping styles relied heavily on trusting in God (endorsed by 100% of the participants) and praying “often” or “almost always” (68%). Accordingly, participants adopted the



practice— common for gatherings in this area—of starting and ending sessions with a prayer and a song.

Uganda illustrates the challenge involved in conducting a project in a setting with multiple languages. Training for peer support champions was in English, so the champions had to be able to read and speak English. However, partners quickly requested that the facilitator at their training sessions use Luganda, the dominant language in the region. Because not all participants spoke Luganda, the project had to provide interpreters for Acholi or Swahili speakers, too.

## Implications For Reform

The four projects described here suggest approaches to several key policy issues, including how to achieve a balance between standardization and flexibility in dissemination of peer support and how to integrate peer support into health care systems.

As noted above, even defining peer support is a major challenge.<sup>8–11,13</sup> However, key functions of peer support can provide a basis for standardization and, as we have shown, can be applied in a wide range of settings.

Turning to integration with health care, the projects described here included peer supporters based in diabetes clinics (Cameroon and Uganda), community organizations outside the field of health (South Africa), and a volunteer service that is part of the health system (Thailand). These and other features in the projects' settings—such as rural and urban sites in Thailand— influenced the details of how the projects were carried out but did not change the fundamental functions of peer support for diabetes management.

The demonstrated feasibility of peer support across varied settings suggests that the strategy could be applied to the patient-centered medical home model that is emerging as an important setting for health care in the United States.<sup>22,23</sup> Drawn from the communities they serve, peer supporters offer natural links to those communities through their social networks and can engage patients who are not receiving the care they need.<sup>24</sup> These functions are consistent with the patient-centered medical home model. Peer supporters, who have time to talk with patients and also have experience with their daily circumstances, can provide credible, practical assistance in initiating and maintaining the daily behavioral patterns that are central to management of chronic disease. Such assistance is also a hallmark of care received in patient-centered medical homes.<sup>25</sup>

Peer support programs could also help address a number of considerations in contemporary health policy.<sup>7</sup> These include the potential of peer supporters to augment the health care workforce and to provide some services at lower cost than current providers can. As illustrated in the use of telephone networking, texting, and automated text prompts in South Africa and Uganda, opportunities also appear to exist for synergies between the “soft touch” of peer interventions and the “high tech” of telehealth.<sup>26,27</sup>

At the same time, greater inclusion of peer supporters in health care would also present questions about appropriately organizing and delivering services. These include the need to

provide staff time for the training, ongoing supervision, and support of peer supporters; and incentives to recruit and retain peer supporters. In addition, clear outcome indicators pertinent to evaluating costs and benefits of peer support would need to be identified.

More broadly, common metrics of research and evaluation would also need to be selected, along with ways to assess peer support's organizational fit with and contribution to improving the value of care delivered through the health care system.<sup>28</sup> Peers for Progress's investigators have identified a set of measures of the clinical, behavioral, self-management, and quality-of-life benefits of peer support that might contribute to such common metrics.<sup>29</sup>

Peer support programs might seem unaffordable in the current environment. However, the Thai health care system—which spent the equivalent of US\$168 per capita in 2009, compared to the US\$7,410 per capita spent by the US health care system in the same year<sup>30</sup>—has been able to afford the village health volunteers since 1978. Similarly, Pakistan is able to afford nonprofessional “lady health workers,” who provide maternal and child services through the country's primary care system and who reach an estimated 80% of Pakistan's rural population.<sup>31</sup>

At the same time, it should be recognized that support programs are neither a panacea for weak health systems nor a cheap option for providing care for disadvantaged populations. Indeed, rather than cheap care for poor people, peer support may constitute good care for all people.

## Conclusion

Peer support interventions to assist patients with diabetes in managing their disease are feasible in varied settings and can engage those whom they are intended to help. Evidence from the projects described here suggests that such interventions improve patients' health behavior, metabolic control, and quality of life. Peer support, then, appears to be a useful and versatile strategy for promoting the kinds of daily, ongoing behavioral efforts that are central to the management of diabetes, as well as most other chronic diseases.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

## Acknowledgments

The programs reported in this paper were supported by Peers for Progress, a program of the American Academy of Family Physicians Foundation, made possible by generous support from the Eli Lilly and Company Foundation.

## References

1. Funnell MM, Brown TL, Childs BP, Haas LB, Hoseney GM, Jensen B, et al. National standards for diabetes self-management education. *Diabetes Care*. 2011; 34(Suppl 1):S91.
2. Brownson, CA.; Heisler, M. [cited 2011 Dec 1] The role of peer support in diabetes care and self-management. *The Patient— Patient-Centered Outcomes Research [serial on the Internet]*. 2009 Mar 1. Available from: [http://adisonline.com/thepatient/Abstract/2009/02010/The\\_Role\\_of\\_Peer\\_Support\\_in\\_Diabetes\\_Care\\_and.2.aspx](http://adisonline.com/thepatient/Abstract/2009/02010/The_Role_of_Peer_Support_in_Diabetes_Care_and.2.aspx)

3. Dale J, Caramlau I, Sturt J, Friede T, Walker R. Telephone peer-delivered intervention for diabetes motivation and support: the telecare exploratory RCT. *Patient Educ Couns*. 2009; 75(1):91–98. [PubMed: 19013741]
4. Heisler M, Vijan S, Makki F, Piette JD. Diabetes control with reciprocal peer support versus nurse care management: a randomized trial. *Ann Intern Med*. 2010; 153(8):507–515. [PubMed: 20956707]
5. Sacco WP, Malone JI, Morrison AD, Friedman A, Wells K. Effect of a brief, regular telephone intervention by paraprofessionals for type 2 diabetes. *J Behav Med*. 2009; 32(4):349–359. [PubMed: 19365719]
6. Lorig KR, Ritter PL, González VM. Hispanic chronic disease self-management: a randomized community-based outcome trial. *Nurs Res*. 2003; 52:361–369. [PubMed: 14639082]
7. Goldfield NI, Rosenthal EL, Macinko J. Community health workers: taking their place in systems of care. *J Ambul Care Manage*. 2011; 34(3):207–322. (Special thematic issue).
8. Brownstein, JN.; Andrews, T.; Wallm, H.; Mukhtar, Q. Addressing chronic disease through community health workers: a policy and systems-level approach. Atlanta (GA): Centers for Disease Control and Prevention, Division for Heart Disease and Stroke Prevention; 2011.
9. Bhutta, Z.; Lassi, Z.; 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 recommendations for integration into national health systems. Geneva: Global Health Workforce Alliance; 2010.
10. Haines A, Sanders D, Lehmann U, Rowe AK, Lawn JE, Jan S, et al. Achieving child survival goals: potential contribution of community health workers. *Lancet*. 2007; 369(9579):2121–2131. [PubMed: 17586307]
11. Lehmann, U.; Sanders, D. 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: World Health Organization; 2007.
12. World Health Organization. Peer support programmes in diabetes: report of a WHO consultation. Geneva: WHO; 2008.
13. The Earth Institute. One million community health workers: technical task force report. New York (NY): Columbia University; 2011.
14. Boothroyd RI, Fisher EB. Peers for Progress: promoting peer support for health around the world. *Fam Pract*. 2010; 27(Suppl 1):i62–i68. [PubMed: 20483801]
15. Fisher EB, Earp JA, Maman S, Zolotor A. Cross-cultural and international adaptation of peer support for diabetes management. *Fam Pract*. 2010; 27(Suppl 1):i6–i16. [PubMed: 19276176]
16. Peers for Progress [home page on the Internet]. Leawood (KS): Peers for Progress; Available from: <http://peersforprogress.org> [cited 2011 Nov 28]
17. Sanguanprasit B, Leelaphan P, Techaboonsermsak P, Jongsuwat R. Community volunteers help control diabetes in Thailand. *Health in South-East Asia*. 2011; 4(2):7–10.
18. American Association of Diabetes Educators. AADE7 self-care behaviors [home page on the Internet]. Chicago (IL): AADE; Available from: <http://www.diabeteseducator.org/ProfessionalResources/AADE7/> [cited 2011 Nov 28]
19. Glasgow RE. RE-AIMing research for application: ways to improve evidence for family medicine. *J Am Board Fam Med*. 2006; 19(1):11–19. [PubMed: 16492000]
20. Green, LW.; Kreuter, MW. Health promotion planning: an educational and ecological approach. 3rd ed. Mountain View (CA): Mayfield; 1999.
21. World Health Organization, Programme on Mental Health. WHOQOL-BREF: introduction, administration, scoring, and generic version of the assessment. Geneva: WHO; 1996.
22. Bayer WH, Fiscella K. Patients and community together. A family medicine community-oriented primary care project in an urban private practice. *Arch Fam Med*. 1999; 8(6):546–549. [PubMed: 10575396]
23. Bielaszka-DuVernay C. Vermont's blueprint for medical homes, community health teams, and better health at lower cost. *Health Aff (Millwood)*. 2011; 30(3):383–386. [PubMed: 21383346]

24. Fisher EB, Strunk RC, Highstein GR, Kelley-Sykes R, Tarr KL, Trinkaus K, et al. A randomized controlled evaluation of the effect of community health workers on hospitalization for asthma: the asthma coach. *Arch Pediatr Adolesc Med.* 2009; 163(3):225–232. [PubMed: 19255389]
25. Siminerio L, Wagner EH, Gabbay R, Zgibor J. Implementing the chronic care model: a statewide focus on improving diabetes care for Pennsylvania. *Clin Diabetes.* 2009; 27(4):153–159.
26. Piette JD. Interactive behavior change technology to support diabetes self-management: where do we stand? *Diabetes Care.* 2007; 30(10):2425–2432. [PubMed: 17586735]
27. Dale J, Caramlau I, Sturt J, Friede T, Walker R. Telephone peer-delivered intervention for diabetes motivation and support: the telecare exploratory RCT. *Patient Educ Couns.* 2009; 75(1):91–98. [PubMed: 19013741]
28. Porter ME. A strategy for health care reform—toward a value-based system. *N Engl J Med.* 2009; 361(2):109–112. [PubMed: 19494209]
29. Peers for Progress. Consensus evaluation for research on self management and peer support in diabetes. Leawood (KS): Peers for Progress; Available from: <http://www.peersforprogress.org/userfiles/documents/436E6FC96DCEBA5424858F300816E2A0.pdf> [cited 2011 Dec 1]
30. Global Health Observatory Data Repository. Health expenditure per capita. Geneva: World Health Organization; Available from: <http://apps.who.int/ghodata/?vid=1921> [cited 2011 Nov 28]
31. Rahman A, Malik A, Sikander S, Roberts C, Creed F. Cognitive behaviour therapy-based intervention by community health workers for mothers with depression and their infants in rural Pakistan: a cluster-randomised controlled trial. *Lancet.* 2008; 372(9642):902–909. [PubMed: 18790313]

**Exhibit 1**

Examples of Specific Approaches to Four Key Functions of Peer Support for Diabetes management in Projects in Cameroon, South Africa, Thailand, and Uganda

<b>Function</b>	<b>Cameroon</b>	<b>South Africa</b>	<b>Thailand</b>	<b>Uganda</b>
<b>Consultation, Assistance in Daily Management</b>	Mainly pragmatic group meetings and frequent individual contacts encourage focus on barriers, personal targets	Group sessions Automated text messages prompt daily management Buddies exchange suggestions in text messages	Individual and group formal and informal meetings to teach and discuss specific behavior for diabetes self-management	Group and individual meetings Regular phone calls address self-management
<b>Social and Emotional Support</b>	In individual meetings, participants discuss personal problems not able to be discussed in group meetings or with providers	Buddies' text messages frequently include social and emotional support	Home visits are conducted by volunteers and occasionally other peers	Frequent phone and face-to-face contact among participants provides social and emotional support
<b>Linkage to clinical Care</b>	Peer supporters are trained not to be clinicians but to serve as a motivational link between participants and clinical care Peer supporters refer and accompany participants to clinical care when indicated	Participants are recruited through health clinics and encouraged through group meetings to avail themselves of regular care as needed	Volunteers are extensions of health centers Health centers participate in project activities and provide technical advice, along with community and provincial hospitals	Prepaid phone network among participants includes health center staff; participants are encouraged to call a nurse with questions
<b>Ongoing availability of support</b>	Model was developed to be continued indefinitely, with group meetings held in convenient locations, peer supporters receiving only modest honoraria	Pairing up participants provides ongoing structure for support All participants have continued to attend weekly group meetings	Health system focuses on continuity of care for chronic disease Continued technical and financial support comes from government, health staff	Pairs and trios of participants are ongoing structure for support Phone and face-to-face support are sustainable if funds are provided for phone expenses