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SUPPLEMENT ARTICLE

Experiences engaging community health workers to provide maternal and newborn health services: Implementation of four programs

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ABSTRACT

A paucity of skilled health providers is a considerable impediment to reducing maternal, infant, and under-five mortality for many low-resource countries. Although evidence supports the effectiveness of community health workers (CHWs) in delivering primary healthcare services, shifting tasks to this cadre from providers with advanced training has been pursued with overall caution—both because of difficulties determining an appropriate package of CHW services and to avoid overburdening the cadre. We reviewed programs in Rwanda, Afghanistan, Nigeria, and Nepal where tasks in delivery of health promotion information and distribution of commodities were transitioned to CHWs to reach underserved populations. The community-based interventions were complementary to facility-based interventions as part of a comprehensive approach to increase access to basic health services. Drawing on these experiences, we illuminate commonalities, lessons learned, and factors contributing to the programs' implementation strategies to help inform practical application in other settings.

1. Introduction

The Alma Alta Declaration of 1978 incorporated volunteer community health workers (CHWs) into the delivery of basic health services at the village level [1] and paved the way for the proliferation of CHW programs [2]. More than 30 years later, many low-income countries are striving to increase the numbers of skilled providers as a way to improve coverage of and access to basic health services, including maternal and newborn health (MNH), family planning, and nutrition [3]. Nevertheless, efforts to strengthen facility services have often not kept pace with the health system requirements needed to provide all citizens access to care [4]. The ongoing crisis in human resources for health remains one of the most critical system challenges, resulting from a severe paucity in the number of providers, inappropriate distribution of existing providers, and insufficient capacity of providers due to lack of training and education [5]. In this context, discussion around the appropriate role of CHWs in reducing maternal, infant, and under-five mortality has been revitalized [6,7].

The term "community health worker" encompasses the roles and responsibilities of various health cadres [6]. Lewin et al. [7] defines a lay health worker—a term often used interchangeably with CHW—as any health worker who: (1) performs functions related to healthcare delivery; (2) has received some form of training relevant to the given intervention; and (3) does not hold a formal professional or paraprofessional certificate or tertiary education degree. Although the profile of CHWs varies across countries, common attributes such as being recruited and supported by the community served [8] may uniquely position the cadre to help address some of the health system challenges that affect access to health facility services.

1.1. Current community health worker situation

Globally, many women, particularly in rural areas, continue to give birth at home without the presence of a skilled provider [9], and families in such settings often seek treatment for child illnesses from informal providers such as medicine vendors [10]. These challenges underscore critical gaps in healthcare access. National MNH survival strategies must employ complementary facility- and community-based strategies, which in some cases might be accomplished by CHWs delivering health promotion information and distributing commodities to communities to achieve greater coverage of priority interventions. Barros et al. [11] reviewed inequalities in maternal, newborn, and child health interventions and concluded that community-based interventions are more equitable than static facility-based services. Thus, task shifting to CHWs to

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provide outreach services in rural communities can help increase overall access to basic interventions [12,13].

The role and need for CHWs has been examined in relation to programmatic opportunities for task shifting, and recommendations for program integration have been issued by both WHO [14] and USAID on this topic [15]. Community-level interventions in MNH have focused on health promotion and distribution of commodities such as iron, folic acid, and vitamin A supplementation [16]. CHWs have also been shown successful in strengthening management of uncomplicated child fever cases in community case management (CCM) of malaria [17], distributing and promoting contraceptives [18], and promoting exclusive breastfeeding [7], although not always sustainably at scale.

While there is evidence, at least in pilot settings, that CHWs can effectively deliver interventions when adequately trained and supervised, debate has persisted on how to best utilize the cadre. The global community has shifted responsibilities to CHWs with overall caution, focusing largely on the intervention itself, rather than on populations in need who are not reached by the current health system [2]. Exploiting opportunities to devolve select interventions to CHWs might help address the human resources for health crisis by enabling skilled providers to focus on those services (e.g. diagnostic, therapeutic) that require a higher level of education or training.

1.2. Jhpiego's experience with community health workers

As part of a comprehensive approach to care, Jhpiego has worked with CHWs in numerous countries as a complement to facility-based care and a key strategy for reaching underserved women and their families with lifesaving services with a focus on MNH. The objective of the present article is to illuminate commonalities and lessons learned from four country programs in which tasks in health promotion and distribution of commodities were intentionally shifted from skilled providers to CHWs to advance MNH strategies. These illustrative experiences, presented as case studies, are assessed—with a focus on CHW scopes of work and factors contributing to the effective implementation of the programs—to help inform practical application in other settings.

2. Methods

Keeping in mind Lewin et al.'s definition of a lay health worker [7], which aligns with Jhpiego's definition of a CHW, we reviewed program reports and other documents collected from Jhpiego's internal repository and program staff's inventories to identify those programs that met the following criteria: (1) CHWs delivered health promotion information and distributed commodities to the community for curative and preventive interventions in support of MNH; (2) CHWs performed a task that had been shifted from a skilled provider; and (3) data on MNH services were available.

We specifically looked for clear examples of "task shifting" because of the potential for this practice to provide relief to overburdened health systems and to reach women and children who are often overlooked. Programs that included components known to support CHW efforts (e.g. community involvement) were also given special consideration, in line with our focus on factors for effective implementation.

After the program documents were reviewed and discussed among staff who were knowledgeable about the CHW programs that fit our inclusion criteria, we selected four that best met our criteria and were "representative," collectively, on a current and global level, in terms of setting/culture and range of challenges. Drawing from these programs, we developed the following case studies to highlight information most pertinent to our objective.

3. Case studies

To provide a general overview of the four selected CHW programs, key information is summarized in Table 1.

3.1. Case study 1: Improving the health of women and newborns in Rwandan communities

Over the past decade, Rwanda has witnessed unprecedented improvement in many health outcomes, including those related to MNH, malaria, and HIV—due, in part, to the government's pioneering of health system reforms and decentralization of the healthcare delivery system. Community-based MNH care was built upon this strong existing foundation and has been embedded within the Ministry of Health (MOH) through community health point persons at the central, district, health facility, and cell (i.e. group of villages) levels.

Of the three CHWs selected per village, two (one female and one male) managed integrated community case management of childhood illness (iCCM), a strategy used to train, support, and supply CHWs capable of diagnosing and treating childhood illnesses including pneumonia, diarrhea, and malaria [19]. A third (female) CHW, called an Animatrice de santé Maternelles (ASM), focused specifically on pregnant women. In 2010, the Home-Based Maternal Neonatal Health Care program, supported by Jhpiego in partnership with Save the Children under the Access to Clinical and Community Maternal, Neonatal and Women's Health (ACCESS) Program and later the Maternal and Child Health Integrated Program (MCHIP), was initiated to increase the capacity of the ASMs. ASMs cover a catchment area of 100–150 households and are responsible for: (1) registering all women of reproductive age and identifying those who are pregnant in the community to encourage prenatal care attendance and facility-based deliveries; (2) promoting healthy behaviors during pregnancy and the postpartum period; (3) accompanying women in labor to the health facility; (4) providing misoprostol (as a uterotonic) in advance to pregnant women for self-administration following birth if they deliver unexpectedly at home; and (5) making early postpartum home visits to identify danger signs and refer women to the health facility as needed.

As part of the Home-Based Maternal Neonatal Health Care program, the ASMs were provided with an MNH care kit and training on how to use the included supplies. ASMs were selected according to specific criteria by community members from the village catchment area under the supervision of the village coordinator, in consultation with the facility health worker responsible for community health. A meeting with the village leaders and the community health supervisor was then held to finalize the selection. Selected ASMs received six days of initial education in community-based MNH services and refresher training after six months. Previously, also under ACCESS, Jhpiego had worked to improve the established ASM system through a wide range of capacity-building efforts.

The program was first implemented in a few districts; the MOH later decided to take the program to national scale. To help facilitate scale-up, innovative technologies were applied, such as the use of mobile phones for rapid short message service, which allowed ASMs to transmit information into a computerized recording and response system. Each ASM in the piloting zones received a mobile phone to report indicators—on community interventions (e.g. iCCM, community-based MNH services), deaths, and other information—directly to SISCom, Rwanda's health management information system. In addition, the ASMs sent alarm messages to the health center to help refer pregnant women quickly.

CHWs were organized by the local government minister into cooperatives composed of approximately 120 CHWs within the facility catchment area, which provided a supportive framework of peer-to-peer support, motivation, and accountability. For example, under the MOH's coordination, the CHWs conducted income generation activities to provide a means of subsistence, while the range and extent of activities were driven by the cooperative. The cooperative program was also

Table 1
Jhpiego community health worker programs selected for case studies.

	Countries			
	Rwanda	Afghanistan	Nigeria	Nepal
Focus of program intervention	MNH and iCCM	PPFP	Malaria in pregnancy	PPH
Tasks shifted to CHWs from formally trained provider	1. CHW: Treatment of diarrhea, malaria and pneumonia; RDT test; direct observation of tuberculosis treatment; provision of family planning; IEC 2. ASM: Identification of pregnant women; birth preparedness; accompany women to deliver at facility; distribution of misoprostol for home deliveries; newborn care; screening for malnutrition for children and pregnant and breastfeeding women; IEC	Contraceptives to postpartum women, including injections	IPTp provision, insecticide-treated net distribution	Advance distribution of misoprostol for self-administration at home births
Program years	2010–2011	2007–2011	2007–2011	2005–2007
Total number of CHWs in program	16 447 out of the total 45 000 in the country	14 389 out of the total 19 000 in the country	735	At scale: 16 920
Geographic scale	National: all 30 districts, among them 11 supported by MCHIP in 2010–2011	National: all 34 provinces of the country	7 local government areas (districts)	Pilot: 1 district (Banke) At scale: 29 districts
Government selection criteria	Female; 25–50 years old; primary school education; literate; resident in village where working; available for home visits; respected by community; volunteer; perceived as honest	Female; willing to work as a volunteer; resident in village where working; respected by community; motivated to serve as a CHW	Willing to work as volunteer; resident in village where working; perceived as honest and acceptable by community	Self-motivated; willing to work as volunteer; willing to act as a focal person to bridge health programs with community
Government Initial Training and program intervention training	2 weeks initial; 6 days on the intervention; refresher after 6 months	9 weeks initial; 5 days on the intervention; refresher after 6 months	9 weeks initial; 5 days on the intervention; refresher after 6 months	18 days initial in two phases; 7 days on the intervention; periodic refresher training
Linkages to health facility	Community focal point at health center level and district hospital level; CHWs call ambulances; access to prenatal care facility data for follow up; reference and counter-reference system clear and operational	Monthly meetings with supervisor and health facility provider; referrals on LAPM to health facilities	Clinic provided trainers and supervisors and managed commodities for collection	Trainers of FCHVs were government staff in health facilities or district health offices; FCHVs reported to facilities; FCHVs shared progress in district semiannual review meeting
Reward/ motivation/support	Funds from income generation activities, materials such as registers and counseling and screening cards, and supplies including demonstration cloths for dry wrap and kangaroo mother care	Community recognition, traditional and creative non-monetary means (e.g. home repair, free transportation)	Community recognition and sense of obligation to his/her clan; materials such as counseling flip chart	Government organized FCHV day celebration and endowment fund; information, education and communication materials
Impact on MNH	150 207 women in labor were accompanied by ASMs to deliver in health facilities; 19 248 pregnant women were accompanied to the health center for pregnancy-related danger signs identified by the ASMs	Injectable contraceptives provided at health posts increased from 49 922 (April 2006–March 2007) to 103 898 (April 2009–March 2010); estimated contraceptive prevalence rate had reached 20%, compared with 10% (2010)	Proportion of pregnant women taking at least two sulfadoxine-pyrimethamine doses during pregnancy was 5 times in the CDI communities compared with 3 times in the control group, for whom IPTp was available only at prenatal care ($P < 0.001$)	840 postintervention survey respondents, 73.2% received misoprostol, and uterotonic coverage increased from 11.6% before the intervention to 74.2% post intervention

Abbreviations: ASM, animatrice de santé maternelles; CHW, community health worker; FCHV, female community health volunteer; iCCM, integrated community case management; IEC, information, education, communication; IPTp, intermittent preventive treatment in pregnancy; LAPM, long-acting and permanent methods; MNH, maternal and newborn health; MCHIP, Maternal and Child Health Integrated Program; PPFP, postpartum family planning; PPH, postpartum hemorrhage; RDT, rapid diagnostic test.

linked to a national health performance-based system to incentivize CHWs on an ongoing basis, based upon achievement and completeness of 26 indicators (e.g. number of women accompanied to the facility for delivery). Each cooperative could receive money on a quarterly basis; on average, a cooperative received between US $1500 and $6000. Based upon the quarterly performance-based financing invoice, 70% of the payment was directed to the cooperative, and 30% was directed to CHWs as an individual incentive. To preclude adverse incentives, the system concentrated on preventive activities rather than curative care.

The cooperatives paradigm has been regarded as a solution for motivating and sustaining CHWs and supporting their integration into the health system. Between July 2010 and June 2011, a total of 2433 ASMs in six of the 30 districts received training in community-based MNH. In the same time period, in those six districts, 19 248 pregnant women were accompanied to the health center for pregnancy-related danger signs identified by the ASMs, and 52.7% of women who delivered in a facility were accompanied by ASMs [20].

3.2. Case study 2: Integration of postpartum family planning with existing MNH services in Afghanistan

Following the exit of the Taliban in 2001, health indicators in Afghanistan were highly unfavorable. The Ministry of Public Health (MOPH) placed emphasis on community-based health care as part of its strategy to expand access to and availability of basic health services, including family planning, as a pillar of maternal health for preventing

unintended pregnancies [21]. Postpartum family planning (PPFP) had also been brought to the fore as a lifesaving intervention, having been repositioned within the last decade—in part by the ACCESS-FP Program (an associate award of the ACCESS Program) and proponents of the lactational amenorrhea method (a short-term contraceptive method based upon patterns of breastfeeding).

In 2007, ACCESS-FP, in collaboration with the Health Services Support Project (HSSP), partnered with the MOPH and the organization Management Sciences for Health to introduce PPFP services to increase contraceptive utilization, address unmet need for contraception, and promote healthy birth-to-pregnancy intervals of at least 24 months. The existing national community-based healthcare system positioned these volunteers as frontline health workers within a basic package of health services (BPHS) [22] at the health post level, their primary functions being health promotion and limited curative care.

CHWs were selected by community health *shura* (councils) after meeting basic selection criteria and were given an eight-week preservice training [23]. With the strong sociocultural preference for female workers, 50% of CHWs were women. Often the female CHW at the health post was a relative of the male CHW, which helped increase cultural acceptability of female CHW roles.

Before commencement of the PPFP program under HSSP, the roles of a female CHW included conducting household visits to deliver counseling in prenatal and postpartum care, as well as providing counseling on family planning and distributing oral contraceptives, condoms, and follow-up doses of injectable contraceptives. Additionally, the Accelerating Contraceptive Use project, led by Management Sciences for Health, supported CHWs in initiating use of injectable contraceptives and administering the first injection on a pilot basis [24]. The PPFP program used the existing cadre, roles, and lessons learned from this pilot as a platform to build CHW capacity to provide counseling on PPFP, including providing the first dose of injectable contraceptives to postpartum women.

After identifying pregnant and postpartum women in their catchment areas through community mapping, CHWs were expected to conducted five household visits at specified times: the first during the eighth month of pregnancy and the other four during the postpartum period. The CHW: (1) provided counseling—assisted by pictorial flip charts—on healthy timing and spacing of pregnancies, exclusive breastfeeding, the lactational amenorrhea method, the return to fertility after pregnancy, transition from the lactational amenorrhea method to other modern methods of contraception, and adverse effects of various methods; (2) distributed condoms and oral contraceptives; (3) administered injectable contraceptives; and (4) made referrals to facilities for long-acting methods.

The strategy for initiating and expanding PPFP services by CHWs was four-pronged: (1) mobilizing the community through the health *shura* and leaders; (2) building capacity of the CHWs through in-service training on PPFP; (3) supporting the CHWs with supervision; and (4) collecting information on contraception distributed by CHWs for monitoring. The expansion strategy was aided by a number of activities and implementing partners. For instance, HSSP supported the MOPH in training CHW trainers in PPFP; in turn, these trainers replicated the CHW trainings at the provincial level with the assistance of nongovernmental organizations contracted by the MOPH to deliver the BPHS. The establishment of a pool of provincial trainers helped to both expand the package of services and promote sustainability. Because CHWs were accountable to health *shura* for performance and community satisfaction, community sensitization meetings were conducted with the *shura* and with community and religious leaders to provide messages on PPFP and galvanize support for the program. In these meetings, the community health supervisors provided information on and addressed myths and misconceptions about the purpose and benefits of PPFP, means of service delivery, and the role of the CHW.

Operations research in Afghanistan on the national CHW program indicate that some, but not all, NGOs implementing the BPHS provided CHWs monetary and non-monetary incentives such as bicycles, literacy training, or furniture for health posts [25]; however, the recent national Community-Based Health Care Strategy acknowledges that support from communities or *shura* to CHWs is variable [26]. The MOPH's expansion of access to quality health care through the BPHS, which includes community-based services, has led to increased services for women, newborns, and children, as well as improved health indicators. While the overall expansion of health services has undoubtedly played a role in this increase, select indicators highlight the possible contribution of PPFP services delivered by CHWs. From 2007 to 2009, 13 provinces in the country piloted community-based PPFP services. Following the pilot period, by the end of 2011, the program had rolled out to all 34 provinces. In total, 14,389 CHWs out of the 19,000 CHWs in the country received in-service training in PPFP [27]. In addition, National Health Management Information System data indicates that the number of injectable contraceptives provided at health posts by CHWs increased from 49,922 (April 2006–March 2007) to 103,898 (April 2009–March 2010). By 2010, the Afghanistan Mortality Survey estimated that the contraceptive prevalence rate had reached 20%, compared with 10% estimated by the Multiple Indicator Cluster Survey in 2003 (Fig. 1) [28–32]. The 2010 Afghanistan Mortality Survey also estimated the country's median birth interval at 27 months in the preceding 5 years. Although data on birth intervals before the survey were not available, the estimate is promising, given that global evidence indicates that birth-to-pregnancy intervals of less than 24 months are associated with adverse maternal and neonatal outcomes.

As a result of the progress observed from the PPFP services provided by CHWs, the MOPH integrated these services into policy documents, including the national Reproductive Health Policy and Strategy, and into the BPHS. With the help of donors and the nongovernmental organizations delivering the BPHS, CHW-delivered PPFP services continue in Afghanistan to date. Efforts are underway to integrate the intervention within the national curriculum for CHWs, as well as to incorporate indicators into the National Health Management Information System.

3.3. Case study 3: Employing a community-directed intervention for malaria control in Nigeria

In 1995, the African Program on Onchocerciasis Control (APOC) managed treatment of onchocerciasis—a parasitic disease that can cause blindness—at the community level through a strategy entitled "community-directed treatment with ivermectin" (CDTI) [33]. CDTI harnesses community engagement through a community-clinic partnership and empowers members to actively participate in delivery of the drug. Under APOC, the "clinic" side of the partnership involved health facility staff: (1) reaching out to communities in their catchment area and encouraging them to take responsibility for the handling and distribution of ivermectin; and (2) training community volunteers to distribute the drug, maintaining stocks of ivermectin at the facility, and collecting completed distribution records. The "community" side

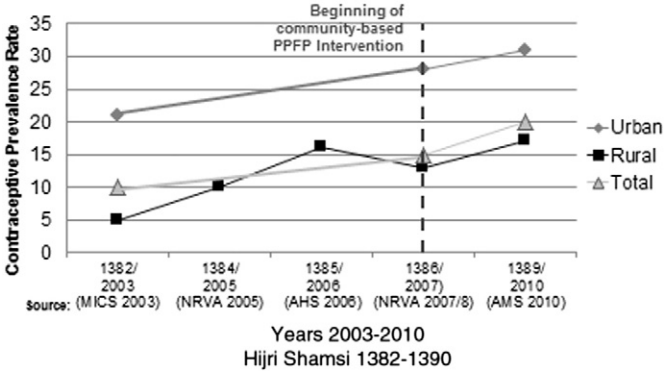

Fig. 1. Contraceptive prevalence rate in Afghanistan, 2003–2010 [24–28].

further engaged the community in planning ivermectin distribution, choosing volunteer community-directed distributors (CDDs) (CHWs in this context), and undertaking village censuses. Communities chose CDDs from among male and female neighbors who were reliable, respectable, and accountable [34]. Literacy was not a requirement, but usually at least one CDD in a village was literate in order to maintain records.

Given the success that APOC experienced in reaching 100 000 villages with CDTI, Jhpiego and other health programs realized the strategy's potential as a model for other health and social interventions [35]. CDDs became involved in immunization outreach, control of other diseases, agricultural extension, and general health promotion, which led the United Nations Development Programme (UNDP)/World Bank/WHO/UNICEF Special Program on Research and Training in Tropical Diseases to design intervention research to test CDTI with other health services. In addition to enhanced ivermectin coverage, this multicountry project found that the approach, now termed "community-directed intervention" (CDI), increased coverage of malaria treatment, bed net use and prevention services, and vitamin A supplementation compared with traditional facility-based services, as well as assisted in directly observed treatment for tuberculosis [36] and intestinal helminth control [37].

Jhpiego, recognizing the community involvement principles behind the successful implementation of CDI, adapted the approach to address malaria in pregnancy in Akwa Ibom State, a highly endemic area of Nigeria where uptake of intermittent preventive treatment in pregnancy (IPTp) and insecticide-treated net distribution had been very low [38]. In the context of Jhpiego's work, a pilot project was conceived on community-directed delivery of malaria in pregnancy control interventions. The clan (large group of families) served as the platform for community engagement. Each clan included about 100 residents and was encouraged to select at least two CDDs to help manage interventions such as health promotion, IPTp provision, recordkeeping, and insecticide-treated net distribution. Primary healthcare facility staff received in-service training in malaria in pregnancy and malaria; they then reached out to the leadership and social structures at the village and clan levels. Every catchment area consisted of four to six villages, and each village contained approximately a dozen clans. Primary healthcare facility staff trained the chosen volunteers, but the clan as a whole kept the volunteers accountable and helped with tasks like census-taking and recordkeeping. Importantly, the involvement of CDDs in delivering IPTp was endorsed through a meeting of stakeholders in the state to overcome skepticism about community capabilities and gain government commitment.

Although CDDs frequently asked about monetary motivation and incentives, the idea of having the smallest community unit, the clan, choose at least two CDDs helped ensure that the workload did not overwhelm volunteers; the arrangement also capitalized on the likelihood that the volunteer would have a sense of obligation to his/her own clan. This intrinsic motivation enabled volunteers to see CDI as a way to help relatives and neighbors, while also gaining recognition for providing a valuable service to their communities. CDD attrition was not an issue because maintaining these human resources was regarded as the responsibility of the whole community (with the support of the primary healthcare facility), which was always ready to identify new CDDs.

The pilot that used the CDI process for malaria in pregnancy achieved significantly higher coverage of IPTp and insecticide-treated nets and prenatal care attendance in intervention communities than control communities without CDI. The effects of the CDI program were largest for IPTp adherence, increasing the proportion of pregnant women taking at least two sulfadoxine-pyrimethamine doses during pregnancy by five times in the CDI communities compared with three times in the control group, for whom IPTp was available only at prenatal care ($P < 0.001$) [39]. Based on this pilot CDI program, the communities were willing to expand their efforts into iCCM, on a trial basis in two communities [40].

3.4. Case study 4: Preventing postpartum hemorrhage at home birth in Nepal

The Nepalese Government created the female community health volunteer program (FCHV) in 1988/89—a group of CHWs that has grown to 48 000 volunteers across the country. Selected by the communities, the FCHVs receive 18 days of initial training in addition to a five-year cycle of five-day refresher training in maternal and child health based on the government's FCHV policy (2003) [41] and periodic refresher training. Their responsibilities have included health promotion and distribution of commodities such as vitamin A, deworming tablets, and iron folate.

In 2006, the maternal mortality ratio in Nepal was 281 per 100 000 live births [42], and nearly half of these deaths were attributable to PPH [43]. The Nepal Family Health Program (NFHP), which aimed to improve MNH outcomes, explored the feasibility, acceptability, and safety of a program for advanced distribution of misoprostol to pregnant women for self-administration after home births for prevention of PPH. This intervention, which was implemented by John Snow, Inc., Jhpiego, Save the Children and partners, was piloted in Banke district, where there were 665 existing FCHVs in the government health system.

The FCHVs had received previous training on other aspects of their assigned tasks, worked 3–8 hours per week, and served for an average of five years. Most of the FCHVs were illiterate [44]. For the purpose of this pilot on PPH prevention, the FCHVs received an additional seven days of training focused on the intervention, which involved identifying pregnant women in their catchment area, providing prenatal counseling, and distributing misoprostol to women who were eight months pregnant for self-administration at home births.

Results showed that of the 840 post-intervention survey respondents, 73.2% received misoprostol, and uterotonic coverage increased from 11.6% before the intervention to 74.2% after the intervention [44]. The most extensive improvements in uterotonic coverage were observed in the two lowest wealth strata. This successful pilot program added to the increasing body of evidence demonstrating that trained CHWs could effectively deliver misoprostol for self-administration by women at home deliveries [45], although scale-up has been challenged in areas such as consistent supply of misoprostol [46]. However, it is a compelling example of the contribution that CHWs can make to improving equity of health interventions.

4. Discussion

The Alma Alta Declaration of 1978 trumpeted the provision of primary health care for all by 2000. Although universal coverage of MNH services has not yet been achieved, the CHW programs reviewed in this article have shown that CHWs can contribute to increased coverage of interventions in pilot and early scale-up efforts in different settings. Scale-up presents many challenges, as reported by Smith et al. [47] in this supplement. Successful national MNH survival strategies will require not only facility-based strategies to provide care during pregnancy, childbirth, and the postpartum period, but also community-based strategies that bring services directly to the household level.

In each of the case studies presented, the CHWs undertook a variety of MNH tasks that had been shifted to them from providers with more advanced training. This shift was made possible through mutual consensus between the health system, which approved the tasks, and the community, which had clear needs for the services. The health promotion and distribution of commodities afforded by these community-based strategies yielded greater uptake of interventions than would have been achieved through facility-based services alone.

4.1. Supportive program components

Drawing on these experiences, we identified cross-cutting health system and community components that facilitated the programs' achievements through the use of CHWs, illustrated in Fig. 2.

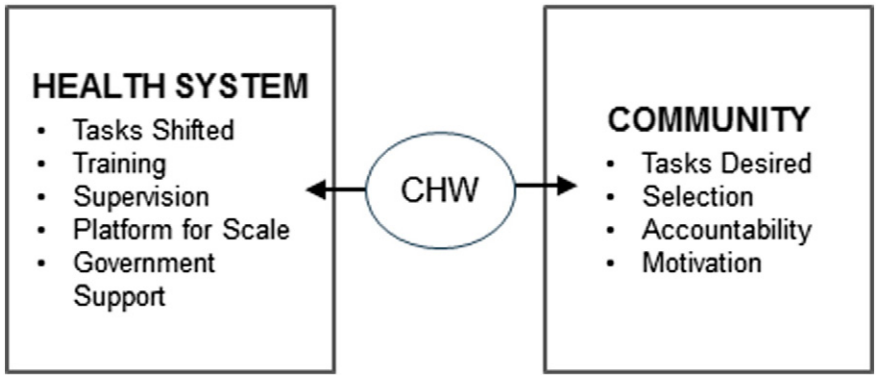

Fig. 2. Key components of successful community health worker (CHW) programs.

All programs built upon an existing platform for CHW delivery of information and services, such as family planning in Afghanistan and prenatal care in Rwanda. Programs facilitated better linkages with health facility services so that a complementary facility-community approach could be employed, often at the local level. In Afghanistan, however, the intervention was introduced as a vertical intervention; later, once the program had demonstrated feasibility, the intervention was integrated horizontally at the national level within the larger purview of CHW responsibilities.

Capacity building of CHWs was achieved initially through refresher training, followed by supportive supervision. Refresher training reinforced the initial training received by CHWs as implementation progressed. As the intervention became more ingrained within the roles of CHWs, the knowledge and skills needed to perform it could be integrated into their initial education.

Community engagement was integral throughout implementation, from community members selecting the CHWs to community members acting as equal and active partners in providing primary healthcare services. This engagement, in turn, helped to influence intervention uptake, as well as CHW accountability and dedication. Whether taking the form of clan members in Nigeria or religious leaders in Afghanistan, the community proved to be a potent force in programmatic success.

A motivational element for CHWs was also shown to be important. Globally, discussion about how to reward CHW performance and whether CHWs should be paid is ongoing. Although we do not answer that question, we have observed that all of these programs used approaches that targeted benefits to the CHW. These include both extrinsic benefits, such as contributions to a CHW savings fund in Rwanda, and intrinsic benefits, such as community accountability to a clan as the primary impetus that fueled CHW motivation in Nigeria.

Sufficient political commitment, including a steady supply of commodities, was integral for the approval of the tasks performed by CHWs. Moreover, government support of CHWs as a permanent component of a comprehensive health system also played a role in success.

4.2. Addressing challenges

In these four country experiences, Jhpiego worked to address context-specific challenges to facilitate CHW program success. When the community-based PPFP initiative commenced in Afghanistan, for example, efforts were initially challenged by misconceptions and restrictive sociocultural beliefs about contraception. One approach to address this issue was to develop PPFP messages consistent with the teachings of Islam. For example, the lactational amenorrhea method—in which fully or nearly fully breastfeeding is one of three criteria for successful use of the method—was linked with Islam's promotion of breastfeeding. These messages resonated with target groups and created common ground where CHWs were able to connect with religious leaders on the subject. Consequently, some *mullahs* integrated lactational amenorrhea method messages within their Friday prayers, helping to achieve broader promotion of PPFP within communities.

While community-based interventions have been found to be more equitable than facility-based services, programs must still ensure that underserved or disadvantaged areas receive access. In Rwanda, for example, despite a larger, more developed CHW presence than in many comparable settings, many women and children are still not being reached. To address this gap, the government is initiating a mapping exercise by CHWs to create a visual representation of catchment areas, including the location of all households. The "map" will be used by CHWs as an aid in monitoring delivery of interventions.

Absence of political commitment is another category of challenge that, alone, might circumvent CHWs from reaching their full potential, arising from a persisting notion that CHWs are only a temporary solution within the health system [48]. Although the 2012 WHO guidelines for the prevention and management of PPH recommend the administration of misoprostol by CHWs [49], polarized discussion continues about whether members of this cadre can provide misoprostol to women *in advance* of childbirth for self-administration after a home birth, to prevent PPH. Despite mounting implementation evidence in favor of this practice to prevent PPH [45], many countries arguably lack the political will to put this lifesaving measure into the hands of CHWs—their most prevalent, far-reaching providers. In contrast, community-based distribution of misoprostol in Nepal was done through the government health system, illustrating ample political support. In fact, all four of the programs described in the present article operated within the government health system, and to date the governments have continued to sustain their respective interventions, integrating them into national policies, health management and information systems, and logistics systems. Political support is therefore paramount for CHW programs to continue expanding access to basic health services.

5. Conclusion

CHWs can take an active role in the delivery of community-based primary healthcare interventions linked to the health facility, as posited by Alma Alta. As illustrated by four Jhpiego-led programs, CHWs have demonstrated that they can effectively deliver MNH and family planning information and distribute commodities that were once regarded as functions of formally-trained health workers. Other studies should be conducted to explore the potential for other services to be transitioned to CHWs, such as screening for pre-eclampsia/eclampsia and providing a loading dose of the anticonvulsant magnesium sulfate to women with eclampsia.

Many factors must be weighed when considering the devolution of tasks to CHWs and effective implementation of related programs. However, these case studies demonstrate that there are MNH/family planning interventions that can be facilitated by CHWs to complement facility services. Through improved access to MNH/family planning

interventions, the scale-up of community-based interventions has the potential to reduce maternal, infant, and under-five mortality. Other countries and CHW programs can apply these lessons learned to increase uptake of MNH/family planning interventions in similar settings.

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Conflict of interest

The authors have no conflicts of interest.

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