Using community resources to provide maternal and child health services: Lessons learned from developing countries

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I. INTRODUCTION

Effective maternal and child health services at the community level in developing countries are hardly available. Many developing countries are faced with an acute shortage of appropriately trained human resources for health. Added to this, is the unavailability of service providers at the community level. Health facilities are found to be generally ill equipped to provide skilled care, and absence of proper referral mechanisms from community to local level health facilities or to district hospitals is also a significant barrier to life saving advanced care. In the coming years, institutions and agencies concerned with improving the currently grim health outlook in developing countries must take a more systemic approach – turning at least some of their attention to apparently mundane matters within the health system, such as infrastructure and health human resources (Savigny et al. 2004). It is obvious that good management and functional networks of communication and transportation are also required.

Various maternal health and child survival programs or strategies have been adopted for achieving certain maternal, infant and child mortality targets among developing countries. It is important to understand the role of the health system in general, and specific program components or strategies in particular in reducing maternal and child mortality. As different countries might have different strategies for maternal and child health improvement with mixed success and failures, there are important lessons to be learned from evaluating the effects of various service delivery improvement initiatives. However, documentation of the implementation experiences of service delivery models or programs or projects (hereafter referred as "models") adopted in the health systems in developing countries, particularly in a compiled form, is not readily available.

It is in this context, attempts have been made in this paper to examine the health service delivery models of the selected countries, which have been implemented with the aim to reduce maternal and child mortality. It is expected that the health policy makers, program mangers, and development partners will find the paper useful since findings presented in this paper will provide evidence on systemic factors that affect maternal and child health in different settings.

II. OBJECTIVES

- Identify the service delivery models or approaches in the health system of selected developing countries, which have contributed to reducing the maternal, infant and child mortality.
- Identify strengths and weaknesses of these models.

III. METHODS AND MATERIALS

The paper primarily reviewed the successful health service delivery models contributed to the reduction of maternal and child mortality in Bangladesh, Pakistan, Cambodia,

Ghana, and Tanzania. The selection of the countries was based on the level of maternal and infant mortality, the initiatives undertaken in the health sector to improve maternal and child health, and the level of progresses towards achieving the health-related MDGs.

The process of identifying the service delivery models included review of relevant literatures describing the role of health service delivery models in improving maternal and child health in the selected countries. In addition, expert opinion was shared at a consultative meeting. Based on recommendations made at the consultative meeting, a list of criteria to select successful delivery models was prepared, which include:

- substantive population coverage
- reasonable process documentation
- duration of the project for at least five years
- community involvement
- public-private partnership
- replicability or potential to upscale and
- sustainability.

Several successful service delivery models implemented in the selected countries were identified. Resource persons prepared country specific review papers focused on selected successful service delivery models. The selected projects are:

- Community Health Volunteers Program in Bangladesh
- Lady Health Workers Program in Pakistan
- Reproductive and Child Health Alliance Program in Cambodia
- Community-based Health Planning and Services in Ghana and
- Tanzania Essential Health Interventions Project.

IV. OVERVIEW OF INTERVENTIONS TARGETED TO IMPROVE MATERNAL AND CHILD HEALTH

Community Health Volunteers Program in Bangladesh

Bangladesh has a pluralist health system with a mix of public, private, NGO, and traditional providers who are operating with variable reach. BRAC, a leading NGO in Bangladesh, provides essential health services in rural areas across the country, while actively collaborating with the Government of Bangladesh in several national health programs. BRAC was one of the pioneer NGOs to have started training village-based community health workers/volunteers to provide services to the people closer to their homes. It started experimenting with *Shasthya Shebika* (community health volunteers or CHVs) from its early days in the 1970s. BRAC started scaling up the program from the 1990s (Khan et al. 1998). While the number of community health volunteers in 1990 was 1,080, it has increased to over 48,000 in the recent years.

Women from poorer households belonging to BRAC supported 'village organizations' were selected to become CHVs and receive no salary from BRAC. The CHVs are given basic training four days per week for four weeks. A critical element of their capacity building is the monthly refresher training on a continuous basis to update their skills. BRAC staff, which includes doctors and program organizers, directly supervises these workers through field visits.

The community health volunteers work part-time, usually in the afternoon, and each is assigned to approximately 300 households. During monthly household visits, they provide education on general preventive and promotive health including safe delivery, family planning, immunization, hygiene, water and sanitation. They provide basic curative services on a few common illnesses. The volunteers also provide high-skilled services such as provision of treatment for tuberculosis and pneumonia. They identify and refer targeted children and pregnant women for immunization and assist in the management of government immunization centers and satellite clinics. BRAC's community health services are implemented in three tiers and community health volunteers represent the lowest tier and are linked to this functioning local health system for referral.

BRAC introduced several innovative ideas to keep CHVs' interest in health work, which included opportunities to earn an income by selling essential drugs and other health products, and access to collateral-free micro-loans to take up other income earning activities involving her family.

Strengths and achievements

With the community health volunteers as the nucleus, the BRAC is implementing various health programs. Being women, and part of and responsible to the community enhanced volunteers' acceptance. The community health volunteers are well trained, well supervised, provided with logistic support, and linked to a functioning local health system for referral when needed.

An evaluation that compared the performance of the community health volunteers with physicians suggests CHVs' effectiveness in identifying and diagnosing ARI cases (Hadi 2003). Similarly, the involvement of volunteers in the tuberculosis program increased detection and cure rates. The 'community health volunteer' strategy implemented by BRAC is considered to be a successful response to the shortage of health human resources in rural Bangladesh.

Challenges or limitations

A study conducted in the late 1990s to evaluate the community health volunteer program found an annual dropout rate of 3.2 percent. Analysis of the causes of dropouts suggest that community health volunteers need to be selected by adhering to defined criteria and the program should develop strategies in partnership of local authorities to keep these workers motivated in their work. Studies have documented that villagers sometime face a dilemma, as the community health volunteers are not 'doctors' but deliver health

services. If villagers consider them as doctors, there may be a risk of malpractice with fatal health consequences.

Lady Health Workers Program in Pakistan

In 1994, the Government of Pakistan introduced the Lady Health Workers Program to provide health services to women and children living in rural and poor urban areas. A new cadre of female workers, commonly known as 'lady health workers' (LHWs), was created. The program is currently being implemented countrywide and has strength of more than 85,000 workers (Karim and Saleem 2006). Each LHW is attached to a government health facility, from which they receive training and medical supplies. A single worker provides services to 1,000 individuals or approximately 200 households (OPM 2002a). As an important part of improving referral mechanism, the program has made the provision to increase linkages between the community and first level care facilities through these workers. LHWs also coordinate with traditional birth attendants (TBAs) and local health facilities.

The program recruits local, literate females as LHWs. These workers receive three months full time basic training at the health facility where she is recruited, and twelve months task based (in-service) training, comprising one week full-time per month for twelve months based at the health facility. The workers are trained to provide basic primary health care, family planning and MCH services and immunization. They are also trained to treat the most common conditions affecting the community (OPM 2002b). The LHW attends monthly meetings at the health facility, which provide an opportunity to review the past month's work and plan for the next month (OPM 2002a). She collects information regarding basic health indices and utilization of services, which is aggregated at the national level and forms an important part of national health statistics. A supervision system has been in place to reinforce the knowledge and skills of LHWs. The supervisor has to visit each worker twice a month (OPM 2002b).

Strengths and achievements

The program provides basic health services to the community at the doorstep and has increased community acceptance of several culturally sensitive issues like family planning. In addition to providing primary health care and family planning services, LHWs are an important source of curative consultations (OPM 2002a). Overall, the services being provided are having a positive impact on health amongst the poor, particularly women and children. LHWs are contributing directly to higher levels of contraceptive use, iron supplementation, antenatal care, growth monitoring and vaccinations amongst their clients. Services rendered by these workers also have helped decrease childhood diarrhea rates (OPM 2002b). The most remarkable change has been the increase in contraceptive use rate from about 12 percent to 34 percent in ten years time (Karim and Saleem 2006).

The hiring of local females contributed in the high level of acceptability and trust that LHWs enjoy in communities. The LHWs form an invaluable body of skilled human resource, the services of whom are often utilized for many other programs. They are

playing an important role in identifying and referring serious illnesses thus acting as a liaison between the formal health system and the local community.

Challenges and limitations

Though LHWs receive good quality training, they lack skills in certain issues. Areas which need improvement are communication and clinical skills (Afsar et al. 2003). The role of LHWs can also be expanded as skilled attendants at births. It is observed that referrals made by LHWs are not given priority at the health facilities, which diminishes their credibility in the community. Furthermore, LHWs are not regularly re-supplied with medicines and contraceptives.

Reproductive and Child Health Alliance Program in Cambodia

Reproductive and Child Health Alliance (RACHA) is a broad-based program of activities, which works at the community, health center and hospital levels. It has adopted innovative methods to increase the use of health services in Cambodia. RACHA activities are incorporated within the national program and works closely with the government. RACHA supported activities tried to improve the quality and availability of maternal, reproductive and child health services in three provinces, covering a combined population of more than 1.5 million. The program utilizes existing resources, whether private or public in nature, both professional and traditional workers (Sturgis 2005). Broadly, the program builds capacity of service providers, works extensively with voluntary sectors for health promotion at the community, and provides technical assistance to improve health service delivery and management.

RACHA has conducted several trainings to build the capacity of local level service providers and other government staff. RACHA pioneered a Life Saving Skills training (basic essential obstetric training) for midwives, the frontline health care providers throughout rural Cambodia. In addition, RACHA utilized trained midwives to train others in antenatal care (Engender Health 2004). The National Maternal and Child Health Center has adapted the curriculum used in the basic essential obstetric care and ANC training programs for their national level training programs (Stoeckel 2000). To ensure safe and healthy mothers, an EmOC program was introduced which included skills upgrading training for doctors and midwives in referral hospitals.

Traditional birth attendants, who deliver majority of babies in Cambodia, were trained to use the ‘home birth kits’ to reduce the risk of infection or death for both mother and newborn during home delivery. TBAs were also trained to act as reliable health educators on maternal and reproductive health issues. The training also highlighted activities that were designed to strengthen the links between TBAs and government health professionals (Stoeckel 2000).

To maintain close contact between ‘health center’ staff and community leadership, ‘feedback committees’ were created. These committees were made up of village representatives. Upon completion of training, committee members educated women about the danger signs of pregnancy and children’s health at monthly meetings. They

provided information to health center staff on health problems in their communities. Moreover, feedback committee members served as distributors of contraceptives for the purpose of expanding the supply of birth spacing commodities at the village level (Stoeckel 2000).

The program trained local religious leaders as volunteers for health promotion at the community. Trained nuns and monks disseminated information to mothers about treating diarrheal diseases using oral rehydration solution, birth spacing and proper breastfeeding techniques (Kannitha, Savery, and Titus 2002).

Major activities conducted by the RACHA program to promote child survival included: providing training to the government health staff and other partners on 'integrated management of childhood illnesses' and vitamin A distribution; assisting the government to institutionalize the 'expanded program on immunization'; and developing guidelines and service delivery strategies for neonatal tetanus elimination.

Innovative community-based incentives were introduced to keep service providers' interest to work and to increase access to maternal and child health services for the targeted populations. RACHA introduced an innovative program for midwives to earn additional income though the sale of health products (e.g., delivery kits and birth spacing methods) when they provide MCH services. The program also introduced micro-credit system to establish strong relationships with villagers by responding to their critical need for credit and subsequently to gain villagers' support for basic reproductive and child health services.

Strengths and achievements

By developing and testing effective or innovative approaches in three provinces, the program helped the Ministry of Health and its multiple partners to improve the service delivery system (Stoeckel 2000). RACHA's safe motherhood program of training rural midwives in basic essential obstetric services has improved the standard of obstetric care at health centers and referral hospitals (Engender Health 2004). The training of midwives and TBAs is considered as a successful response to acute shortage of health human resources in rural Cambodia. Trained midwives effectively deliver clinical maternal health services (Engender Health 2004) and trained TBAs are making home births safer (Stoeckel 2000).

Religious leaders and other community members trained as volunteers have proved to be an effective force for educating and mobilizing local populations for maternal and child health services. Trained feedback committee members serve as a link between the health center and rural people. This allows the health center staff to intervene immediately, particularly in emergency cases (Stoeckel 2000). As a result of the health promotion activities conducted by RACHA, women changed their behavior and practices (Kannitha, Savery, and Titus 2002). The increased number of women collecting iron tablets regularly from the health center, exclusively breast-feeding, making ANC visits, and

receiving postnatal care and birth spacing services from health centers attests to the success of the health promotion activities (Stoeckel 2000).

Challenges or limitations

Increasing utilization of reproductive and child health services is constrained by several factors. The availability of trained staff to conduct health activities at the community level is severely limited (Stoeckel 2000). TBAs and midwives need to coordinate their work to promote quality services and to increase the number of deliveries by midwives. Appropriate follow-up is essential for TBAs since they coordinate with government staff on a voluntary basis and need regular support.

Community-based Health Planning and Services in Ghana

The Community-based Health Planning and Services (CHPS) initiative is a national program for reorienting and relocating primary health care and family planning services from sub-district health centers to convenient community locations. The Ghana Health Service is currently promoting the CHPS initiative as its primary strategy for realizing universal access to health care (Awoonor-Williams et al. 2004). Community health nurses, retrained and redeployed as community health officers at the newly constructed or renovated health compounds, are the central staff of the CHPS program. The program is responsible for supporting the nurse's training and for supplying essential equipment, and start-up drugs. With modest financial support, communities build clinics and maintain health and family planning services. The community is obliged to maintain the facility, provide security, and support the nurse's daily living needs (Ghana Health Service 2002a).

Implementation of the CHPS program begins with identifying service area, assessment of manpower needs and capacities, and assessment of equipment and training requirements (Nyonator et al. 2002). Planning also involves a process of consensus building among the workers of a given CHPS implementation district (Ghana Health Service 2002b). When communities have been mapped and problems assessed, dialogues are organized in the community through public gatherings to introduce the activities (Awoonor-Williams et al. 2004). The process utilizes this traditional communication mechanism for mobilizing community support for clinic construction. These facilities, referred to as community health compounds, become the residence as well as the service delivery points of the community health nurses (Awoonor-Williams et al. 2004).

The posting of nurses at the community level represents the most critical milestone in the CHPS process. These nurses, termed community health officers (CHOs), are community-based frontline health workers. Nurses entering the program receive an 18-month training at national training institutions and then intensively for six weeks in methods of community engagement, liaison, and outreach (Phillips, Bawah, and Binka 2005). Additionally, CHOs are trained in midwifery. These trained nurses provide outreach services in addition to convenient compound-based care during well-publicized hours of service delivery (Phillips, Bawah, and Binka 2005). Besides providing primary health care and prescribing selected drugs, they supervise safe delivery and are also responsible

for organizing immunization and outreach days. These community health officers provide referrals to the clinics or hospitals for any services they are not able to provide (Pence et al. 2005).

To support the community health officers, a cadre of primarily male health volunteers are recruited and trained (Awoonor-Williams et al. 2004). Volunteers visit households to talk about hygiene, child immunization, and other basic health issues, and to make the community aware of the availability of basic treatments and referrals (Pence et al. 2005). The volunteers also focus on mobilizing male participation in family planning promotion (Ghana Health Service 2002b).

Strengths and achievements

Community mobilization combined with community-based deployment of the nurse represents the most effective innovative intervention to enhance service coverage. The CHPS process advances a system for community participation and leadership in managing and supporting health programs. These health services are sustainable with available resources (Ghana Health Service 2002a).

CHPS is a successful program implemented at the national level. CHPS model has become an integral part of government policy agenda to provide health care to communities in undeveloped and deprived areas distant from health facilities (Ghana Health Service 2002a). As a result, an increased number of women and children are receiving services from trained nurses posted at the community. Evidence suggests that assigning nurses to village locations reduced child mortality rates by over half in three years in the study areas. In addition, fertility was also reduced by 15 percent, representing a decline of one birth in the total fertility rate (Phillips, Bawah, and Binka 2006).

Evidence-based strategies of CHPS are now being transferred and adapted to other countries in the region. Burkina Faso and Sierra Leone are working to develop pilot studies that adapt the CHPS processes to local contexts (GHS, NHRC, and Population Council 2005).

Challenges or limitations

Dearth of human and financial resources is a major constraint for nationwide implementation. Even if all available community nurses were trained and deployed, a serious shortage would still exist in many districts. Another important challenge is to build the capacity of community health officers to make independent clinical decisions or to offer effective midwifery services. The activities of the volunteers should be limited to health education, outreach coordination, and family planning provision. Earmarked donor or government investment in community health compound construction material and equipment is required.

Tanzania Essential Health Interventions Project

The Tanzania Essential Health Interventions Project (TEHIP) started in 1996 to test the hypothesis that health care spending would have a greater impact if directed towards

cost-effective interventions. The experiment was introduced in two districts, covering a total population of 741,000. TEHIP was designed and implemented with the intent to work within the existing health planning and management systems, rather than creating a parallel system. TEHIP developed several tools that enable district health management teams to set priorities, allocate resources as part of their planning processes, and promote integrated solutions that offer multiple benefits from health interventions.

The district health management team identified the missing skills, particularly local deficits in management, administrative, and other skills. Several supportive interventions were introduced with the aim of improving the quality of health care. These interventions are: additional funding at the district level, strengthening district health management and administration, delegation of activities, and community ownership of health facilities.

In order to test innovations in the planning process the project introduced additional funds (up to US $2 per capita) into the district health budget. These funds allowed districts to achieve new efficiencies in the daily operations of health systems and to increase spending where needed on interventions aimed at the most significant contributors to the local burden of disease (Savigny et al. 2004).

To organize and integrate health service delivery at the district level more efficiently and economically, an innovative management system (termed 'management cascade system') was introduced. This new strategy was aimed at creating a "functional hierarchy" below the district and devolving authority and responsibility to lower levels within the health system. It also intended to promote the links between community health workers and supervisory personnel. Several activities were undertaken to improve the efficiency of routine functions. Additionally, the radio call system and appropriate transportation including motorcycles and bicycles were introduced to improve the referrals (Savigny et al. 2004).

To make community participation effective, the project adopted two main strategies. One centered on mobilizing and stimulating communities to renovate run-down health care facilities. The community contributed labor and materials in carrying out the rehabilitation and maintenance of health facilities. The other sought to implement the "community voice" tool to help people identify local health needs and set priorities. These priorities would then be fed into the district planning process, with community and district working together to determine plans of action.

Strengths and achievements

The development of management tools and strategies proved to be invaluable aids for the district health teams to improve health services in their areas. Used in conjunction with the burden of disease and resource allocation tools, the additional fund enabled district health planners to implement the selected health services and interventions effectively and efficiently. Added to this was the involvement of the community in the planning process, which brought changes in the health service delivery system.

The new management system devolved authority and responsibility to lower levels within the health system and improved the service delivery, including referral of emergencies. It improved the distribution of drugs in the villages, particularly at the dispensaries and reduced problems that had existed in the distribution of staff pay (Savigny et al. 2004).

Community participation was central to the TEHIP approach. Community inputs for rehabilitation of health facilities were used as an entry point to engage the community members into planning, implementing, monitoring and evaluating the process (Savigny et al. 2002).

The TEHIP approach improved the functioning of the health system. Child mortality in the project areas fell by over 40 percent in the five years following the introduction of evidence-based planning (IDRC 2005). Successful implementation of TEHIP influenced formulation and content of national health policies, and content and delivery of district health services in two project districts. The experience of the project is being scaled up nationally. The management tools, supportive interventions, and innovative practices are being made available to continue to extend and improve the effectiveness of district health systems.

Challenges or limitations

The cost of expansion, the lack of capacity to replicate, the technical support required to implement the tools in the scale up districts, and the lack of coordination among various players working in the health sector are seen as constraining factors inhibiting TEHIP's influence, or future potential. Delivery of scaled-up health services ultimately depends on well-supported primary health care providers. Also, there is a need to ensure quality health facility infrastructure and equipment, and information and communication technologies.

V. FINDINGS

The paper reviews experiences of selected service delivery models implemented in the health systems in Bangladesh, Pakistan, Cambodia, Ghana and Tanzania. Efforts have been made in the following section to identify the key interventions of the successful service delivery models and lessons learned from these interventions.

Capacity building of local level service providers

The knowledge, skill, commitment and motivation of the service providers have been found to be the key strength of any program. The community health volunteer model in Bangladesh demonstrates that appropriately selected and trained community members can deliver basic health services to the local population. Being provided with logistic support, and linked to a functioning referral system, the community health volunteers provide targeted services effectively at the doorstep. In the same way, the strategy to recruit and train female workers to bridge the gap between service delivery from health facilities and the community also worked in Pakistan. LHWs form an invaluable body of

skilled human resources to provide family planning and primary health care services including immunization to the local population. These trained workers have proved their effectiveness in providing doorstep services, identifying and referring serious illnesses, and participating in other health programs of the government.

In Cambodia, RACHA program increased midwives' capacity to deliver both quality clinical services and health education to rural communities to meet the needs of pregnant women. TBAs were trained to use the 'home birth kits' to reduce the risk of infection or death for both mother and infant at home delivery. Trained TBAs also act as credible health educators. In Ghana, community health nurses, retrained and redeployed as community health officers, provide outreach services in addition to convenient clinic-based care.

Along with the training it is equally important that some form of incentive to work in rural areas is necessary for trained health personnel. Both BRAC in Bangladesh and RACHA in Cambodia introduced several innovative ideas to keep community health volunteers or midwives' interest in health work. Ineffective communication and a lack of social mobilization skills were identified as barriers to the implementation of effective communication strategies for improved MCH services in Pakistan and Cambodia.

Community level interventions

Residing in the locality has enabled community health workers to earn the trust and acceptability to implement different interventions on maternal, newborn and child health. BRAC's experience suggests that being a female member of the community where she works has made the CHVs deliver targeted services effectively to both mother and child in rural areas in Bangladesh. The hiring of local females contributed to the high level of acceptability and trust that LHWs enjoyed in communities in Pakistan. LHWs usually play the expected 'first contact' role and act as a liaison between community and formal health system.

In Ghana, community-based strategies including launching fixed facility services in the community and relocating trained nurse from the sub-district level facility to the village level clinic with doorstep service delivery responsibilities have made the CHPS initiative a success. CHPS initiative engages community people in local health care activities. The program recruits and trains volunteers and links them with community health officer's activities. The process also utilizes the traditional communication mechanism for mobilizing community support. Accordingly, local realities and necessities are reflected in planning and developing health services. Similarly, Tanzania Essential Health Interventions Project engaged the community in planning, developing and managing local health services. Communities took ownership and responsibility for their own health facilities and services.

Using community resources for health promotion has in part contributed to the success of RACHA program in Cambodia. The use of religious leaders or volunteers for health promotion is an effective approach, which increases demand for health services and

changes behavior among the rural people to utilize health care. Feedback committee members are selected from the villages nearby the 'health center' and trained to give feedback to the health center. They effectively conduct health and family planning promotion activities in the community.

Strengthening health service delivery system

Capacity building activities are generally coupled with a range of complementary interventions to strengthen the overall health service delivery system and to create an enabling environment that supports skilled providers or trained community health workers. Activities to improve health care service delivery center on infrastructure, equipment and supplies, information and transportation, and referral.

In Ghana, facility-based services have been launched in the community. With the strengthened logistic system and effective referral, quality services have been ensured at the community level. Outreach services and compound-based care provided by the community health officer, and coordination of volunteers' services with community health officer's activities and clinical services have established a systematic linkage for health care at the rural community.

The TEHIP approach has improved the functioning of Tanzania's health system by using the planning tools and the additional fund. The management, planning and priority-setting tools help identify cost-effective health services reflecting the local needs. The involvement of the community in the planning process brought changes in the health service delivery systems. The new management system devolved authority and responsibility to lower levels within the health system and improved the service delivery. However, Tanzania's experience emphasized the need for quality health facility infrastructure and equipment to provide essential packages of health services in rural areas.

Appropriate logistic support, linkages with a functioning local health system for referral and supportive supervision have enabled the trained community health volunteers to improve the availability of basic health services to local populations in Bangladesh. In Pakistan, LHW services provided to the community have strengthened the health system by increasing linkages between the community and first level care facilities. In Cambodia, the RACHA program provides a successful example for utilizing elements of both the formal and informal systems and linking them wherever possible in delivering health services in rural areas. It is observed that trained feedback committees serve as a link between the health center and the rural people. Cambodia experience, however, suggests that TBAs and midwives should be linked up to promote service quality and to increase the number delivered by midwives.

VI. CONCLUSION

Many developing countries are yet to ensure effective maternal and child health services at the community level. With the aim to improve maternal and child health, innovative approaches or service delivery models have been implemented in Bangladesh, Pakistan, Cambodia, Ghana, and Tanzania. Strengthening health systems with skilled and motivated health workers is central to improve maternal and child health. Outreach is enabling the system to achieve the program objectives in reaching rural people. However, these interventions are not equally effective.

The major strength of these selected service delivery models is their community-based health care approach. Implementation of these interventions demonstrates some significant achievements required to reducing maternal and child mortality. The important factors are: capacity building which includes training of service providers and recruiting and training community health workers/volunteers; selecting females as the health care providers; upgrading facilities or strengthening service delivery structure; involving the community in developing and implementing health services; developing evidence-based planning; and strengthening linkages for referral.

Community health workers and volunteers have been used as a strategy to bridge the human resource gap in different settings. Certainly, the availability of trained service providers and health workers at the community level increases the access to maternal and child health services to the local population. To complement the facility-based services provided by skilled human resources, outreach services by community health workers or volunteers, and linking their services with facility-based services are necessary to improve maternal and child health service coverage in rural and remote areas. Community-based workers are necessary for two reasons: bringing the villagers the care they need and deserve; and linking the local populations to the first level care facility and larger healthcare system. Being female and member of the community where she works, selected by the own community, and responsible to the community have made community health workers deliver targeted services effectively to both mother and child. Additionally, to meet the growing needs of the local people, community health workers' services can be utilized for other health services. Their role can be expanded as skilled attendants at births.

The necessity for strengthening health service delivery system is accentuated in many developing countries. For example, as long as essential emergency care services remain absent or inaccessible, neither trained rural midwives nor trained TBAs will be able to achieve significant improvements of care in critical obstetric situations. If necessary, the existing infrastructure needs to be upgraded. Evidence also suggests establishing and maintaining linkages with higher and lower level health care facilities. Linkages between volunteers, TBAs and midwives are expected to promote service quality, increase the number delivered by midwives or provide referrals to clinics or hospitals for any complicated services.

It is evident that implementation of community-based health services takes into account local realities and necessities and engages community members and resources in constructing or renovating health facilities and managing services. Local level health systems should have the ability to allocate health resources in strategic ways that target real and prevailing needs. In this connection, the planning and management tools and strategies proved to be invaluable aids to the local level facility staff to improve health services in their areas. Funding and implementation priorities must be based upon local level, evidence-based plans that aim to improve the health system, maximize health, and reduce inequities.

The maternal and child health services need to be decentralized to the lowest level of the health system that can plan, implement and manage service delivery, and mobilize resources to continue to provide these services. This is an effective strategy to reach those women and children who are least able to access hospital care including the poor, uneducated, and/or those living in remote, rural settings.

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