



Building on the Current Evidence to Strengthen Community-Based Service Delivery Strategies for Promoting Child Survival

The Problem

Even though the annual number of child deaths globally has recently fallen below 9 million compared to 19 million in 1960, the great majority of child deaths are still caused by readily preventable or treatable conditions. Ninety-seven percent of these deaths now occur in 68 countries. However, as Table 1 indicates, only 16 of these 68 countries are on track to achieve Millennium Development Goal (MDG) 4 at the time of the 2008 Countdown Report [1]. MDG 4 calls for a two-thirds reduction (based on 1990 levels) in child mortality by the year 2015. Among these 16 countries there is only one African country on track – Eritrea. Clearly, new initiatives and approaches are needed in those areas where child mortality levels remain high, health systems are weak, and resources are limited [2-3]. This document highlights four community-based delivery strategies that are common in most reports that have demonstrated improvements in child health in high-mortality, low-resource settings. These findings should be of interest to district-level managers, Ministry of Health officials, national-level policy makers, and donors.

TABLE I. STATUS OF 68 PRIORITY COUNTRIES WITH RESPECT TO ACHIEVING THE MILLENNIUM DEVELOPMENT GOAL FOR CHILDREN (2008)

On Target	Not on Target, but Some Progress	No Progress	Worsening of Under-5 Mortality Rate
Bangladesh	Azerbaijan	Afghanistan	Botswana
Bolivia	Benin	Angola	Cameroon
Brazil	Cambodia	Burkina Faso	Central African Republic
China	Côte d'Ivoire	Burundi	Chad
Egypt	Djibouti	Congo, Democratic Republic of the	Congo
Eritrea	Ethiopia	Gabon	Equatorial Guinea
Guatemala	Gambia	Ghana	Kenya
Haiti	Guinea	Iraq	Korea, Democratic People's Rep.
Indonesia	Guinea-Bissau	Lesotho	South Africa
Lao People's Democratic Republic	India	Liberia	Swaziland
Mexico	Madagascar	Mali	Zambia
Morocco	Malawi	Mauritania	Zimbabwe
Nepal	Mozambique	Rwanda	
Peru	Myanmar		
Philippines	Niger		
Turkmenistan	Nigeria		
	Pakistan		
	Papua New Guinea		
	Senegal		
	Somalia		
	Sudan		
	Tajikistan		
	Tanzania, United Republic of		
	Togo		
	Uganda		
	Yemen		

In order to accelerate progress in these 68 priority countries, there have been calls for more direct funding for maternal and child health programs (since overseas development assistance has concentrated on HIV control and on technical cooperation) [4], health systems strengthening [5], integration of key interventions via a continuum of care [6-7], and stronger community participation [8]. However, these calls have not sufficiently emphasized the importance of key community-based service delivery mechanisms for accelerating progress. Too often, more attention has

been focused on the technical aspects of community-based interventions than on the strategies and support systems that are needed to make these interventions effective in practice.

The current evidence base is derived largely from small demonstration projects, short-term randomized controlled trials, and efficacy studies of single interventions. Ideally, the evidence base should also consist of independent rigorous assessments of large-scale integrated programs at scale carried out for five or more years. However, in lieu of this, the best we can do at present is to build on the current evidence as new programs are currently being designed.

A recent comprehensive review of the effectiveness of community-based primary health care in improving child health has identified four key community-based service delivery mechanisms that are common to virtually all successful health programs that have documented improvements in geographically defined populations of children in developing countries. Other recent reviews have highlighted family and community practices that are important for child health [9] as well as specific technical interventions that are effective in improving child health [10-13], but none have to date focused on the key delivery mechanisms required to make these interventions effective. This communication highlights these key community-based service delivery mechanisms and their importance for accelerating progress in reaching MDG 4 in priority countries.

Effectiveness of Community-Based Primary Health Care in Improving Child Health: Results from a Comprehensive Review

Under the guidance of a panel of 21 global experts, a Task Force of the Working Group on Community-Based Primary Health Care (CBPHC) sponsored by the International Health Section of the American Public Health Association conducted a comprehensive review of the effectiveness of CBPHC in improving child health. For the purpose of the review, the Task Force defined CBPHC as one or more activities that (1) are intended to improve child health and that (2) take place outside of a health facility (although some of the activities could take place within a health facility). This broad definition includes highly selective as well as integrated approaches. Details of the methodology of the review are available elsewhere [14].¹ Almost 4,000 documents were identified and screened, and 10 percent met the criteria for inclusion in the review. In addition to these documents, 40 published reviews of specific intervention topics were included.

Strategies Used to Implement Effective Interventions

Four key types of strategies were common among the assessments of effective CBPHC programs included in the review: (1) routine systematic visitation of all homes, (2) facilitator-led participatory women's groups, (3) recognition, referral, and (when possible) treatment of serious childhood illness by mothers and/or trained community agents, and (4) health service provision at outreach sites.

ROUTINE SYSTEMATIC VISITATION OF ALL HOMES

Home visitation makes it possible to identify those in need of basic services and to provide everyone in the program population with essential health education and selected key services, particularly during pregnancy and the early neonatal period. Home visitation by community-based workers makes it possible to identify pregnant women and mothers of young children, provide education to them and other family members (especially husbands and mothers-in-law), recognize danger signs during pregnancy and childhood illness, encourage referral when danger signs are present, and provide treatment for certain conditions such as growth faltering, diarrhea, pneumonia, and malaria.

The World Health Organization and UNICEF recently recommended that all pregnant women receive two home visits during the prenatal period, one home visit during the first 24 hours after birth, and at least one (and preferably two) more visits during the neonatal period [15].² Activities that should take place during these visits include the fol-

¹ Available at: <http://aimdb.files.wordpress.com/2009/08/finalcbphcreporttoerp-7july2009.pdf> and http://www.coregroup.org/storage/documents/finalcbphcreport_july2009.pdf.

² Available at: http://whqlibdoc.who.int/hq/2009/WHO_FCH_CAH_09.02_eng.pdf.

lowing: education about proper nutrition, promotion of antenatal care, education about danger signs during pregnancy and childbirth, promotion of immediate breastfeeding, prevention of hypothermia, and measurement of the weight of newborns to identify low-birth weight (and to carry out more frequent home visits if low-birth weight is present).

Home visitation is also an effective means of providing counseling about breastfeeding and appropriate complementary feeding, hand washing, prevention and treatment of diarrhea, detection and need for early treatment of childhood pneumonia, and birth spacing. There are a number of variations of home visitation strategies using community-based workers, from providing micronutrients to children during weekly home visits [16] to regular visitation of all homes in a program population as part of a more comprehensive approach to delivering basic services to the entire population [17].

FACILITATOR-LED PARTICIPATORY WOMEN'S GROUPS

Participatory women's groups facilitated by properly trained health workers provide the opportunity for further empowerment and education about healthy behaviors, danger signs of serious illness, proper care of the newborn, and non-health issues that are a priority to the community and may have an indirect effect on health (such as income generation activities). These groups also provide a vehicle for counseling about breastfeeding, birth spacing, infant feeding, hand washing, prevention and treatment of diarrhea, signs of childhood pneumonia, and danger signs during pregnancy and childbirth. Women's groups also are effective for assisting mothers to rehabilitate malnourished children detected through growth monitoring. The literature illustrates several effective approaches to facilitating participatory women's groups, including the use of a participatory action-learning cycle [18], formation of "Care Groups" [19], and education sessions led by community mobilizers [20].³

RECOGNITION, REFERRAL, AND (WHEN POSSIBLE) TREATMENT OF SERIOUS CHILDHOOD ILLNESS BY MOTHERS AND/OR TRAINED COMMUNITY AGENTS

The review identifies considerable evidence regarding the effectiveness of training and supervising community-based workers to teach pregnant women and their families about danger signs during pregnancy and childhood illness [21-23]. Community-based workers can learn to recognize the signs and symptoms in children of neonatal sepsis, malaria, pneumonia, severe diarrhea, and severe malnutrition, and they can teach these signs and symptoms to mothers. Successful programs were also identified in which community health workers treated these conditions (or even taught mothers how to treat these conditions) as long as proper training, supervision, and logistical support for medications are provided [24-27]. The community-based treatment modalities include administration of oral (and in a few cases intramuscular) antibiotics, administration of oral rehydration fluids, and provision of highly nutritious foods available locally or commercially prepared (known as ready-to-use therapeutic foods). When this capacity does not exist, mothers can be notified that urgent treatment at a referral health facility is needed. A comprehensive manual for community-based diagnosis and treatment of serious childhood illness has recently been completed and is now available for general use [28].⁴

HEALTH SERVICE PROVISION AT OUTREACH POINTS (MOBILE CLINICS, IMMUNIZATION SESSIONS, ETC.)

The provision of immunization services by mobile health teams at points beyond a health facility is now well-developed in virtually all high-mortality countries. Currently 80 percent of children in the 68 priority countries are covered with three doses of diphtheria, pertussis and polio vaccine and a measles immunization [2], and most immunizations in low-resource settings are given at outreach points. There are many examples of programs with evi-

³ "Care Groups" are 10-15 women volunteers who meet with a trainer/supervisor once a month to learn a key health education message to disseminate to each of the mothers in the 10-15 households surrounding each volunteer.

⁴ Available at: http://207.226.255.123/ccm/ccm_field.html.

dence of improvement of child health that use service provision at outreach points to provide other services as well. These services include provision and promotion of family planning, provision of antenatal care, testing for HIV and syphilis, distribution of insecticide-treated bed nets, provision of medications to prevent or treat malaria, and growth monitoring to detect cases of childhood malnutrition.

One variation in the provision of health services at outreach points is the initiative referred to as Child Health Days (or sometimes Child Health Weeks). These involve high-profile efforts to reach every child and every pregnant mother or mother of a young child usually twice a year with immunizations, vitamin A, and other simple interventions such as nutritional monitoring (and referral of malnourished children), distribution of oral rehydration packets, water-purification tablets, or de-worming tablets [29-30]. These have been carried out in many countries in Africa and Asia. Services are provided at outreach points, but sometimes home visits are carried out to reach those mothers and children who did not come to the outreach points.

These four community-based service delivery strategies, employed either individually or together, represent strategies which national disease control programs, curative health systems, and health education programs should consider for delivering their technical interventions, as Figure 1 indicates. Hopefully, funds will be made available by donors in the near future to rigorously assess the effectiveness of these approaches at scale in more routine conditions. However, to do so will require a major commitment from donors since such assessments are expensive. Funding has rarely been available for such activities in the past, and a new alliance between academia and program implementers will need to be established [31].

Too often, attention has been focused on the technical interventions, not on the strategies by which they are delivered or on how they are linked to the overall health system. Developing stronger community links with services provided at the nearest health facility, with national disease-control programs, with other health-related efforts like

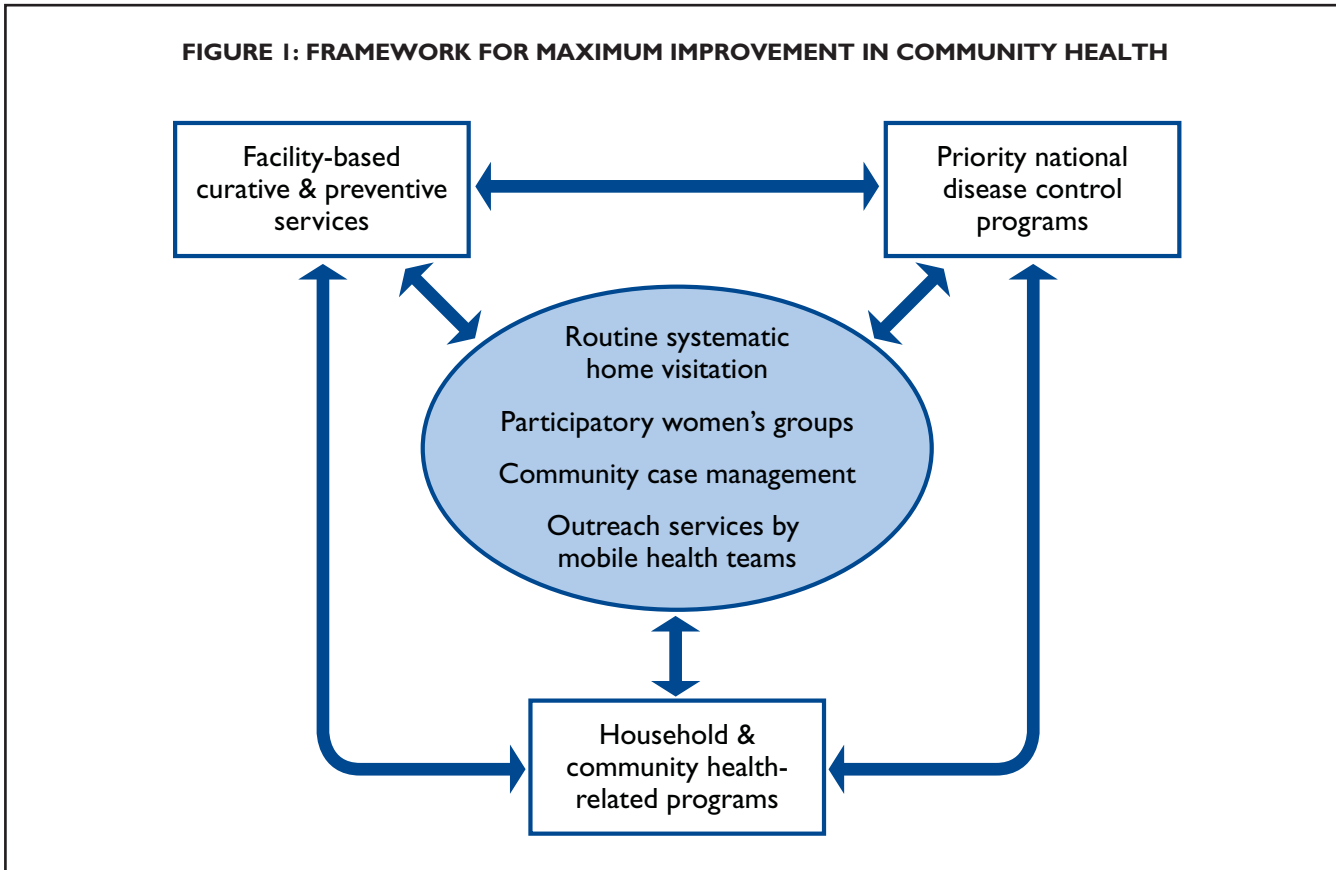


TABLE 2. INTERVENTIONS THAT CAN BE PROVIDED IN THE COMMUNITY WITH STRONG EVIDENCE OF EFFECTIVENESS FOR IMPROVING CHILD HEALTH

Technical Intervention	Community-Based Delivery Strategy			
	Home Visits	Participatory Women's Groups	Community Case Management	Outreach Services
Immunizations: BCG, polio, diphtheria, pertussis, tetanus, measles, Haemophilus Influenza Type b (Hib), pneumococcus, rotavirus immunizations for children; tetanus immunization for mothers and women of reproductive age				
Provision of supplemental vitamin A to children 6-59 months of age and to post-partum mothers				
Provision of preventive zinc supplements to all children 6-59 months of age				
Promotion of breastfeeding immediately after birth, exclusive breastfeeding during the first 6 months of life and continued non-exclusive breastfeeding beyond 6 months				
Promotion of appropriate complementary feeding beginning at 6 months of age				
Promotion of hygiene (including hand washing), safe water, and sanitation				
Promotion of oral rehydration therapy (ORT) and zinc supplementation for children with diarrhea				
Promotion of clean deliveries, especially where most births occur at home and hygiene is poor				
Promotion and provision of community-based treatment of childhood pneumonia				
Home-based neonatal care (promotion of immediate and exclusive breastfeeding, promotion of cleanliness, prevention of hypothermia, and diagnosis and treatment of neonatal sepsis by Community Health Workers)				
Community-based rehabilitation of children with protein-calorie malnutrition through food supplementation (including rehabilitation of children with severe acute malnutrition through ready-to-use dry therapeutic foods)				
Insecticide-treated bed nets (ITNs) in malaria-endemic areas				
Indoor residual spraying in malaria-endemic areas				
Promotion and provision of community-based treatment of malaria				
Intermittent preventive treatment of malaria during pregnancy (IPTp) and infancy (IPTi) in malaria-endemic areas				
Detection and treatment of syphilis in pregnant women in areas of high prevalence				
Promotion of HIV testing in pregnant women and prevention of mother-to-child transmission (PMTCT) of HIV infection				
Iodine supplementation in iodine-deficient areas where fortified salt is not consumed				
Provision and promotion of family planning services				

*Outreach of health facility staff includes holding mobile clinics and/or immunization sessions at specified locations on a regular basis.

improving water, sanitation and hygiene can lead to a stronger overall impact on the health of every community member, particularly in high-mortality, low-resource settings (Figure 1).

Current evidence does not allow for a conclusive assessment of the relative importance of each implementation strategy. Contextual issues in specific settings will be important, as they affect feasibility, scalability, and long-term sustainability. The amount of funding available will affect the prioritization of strategies, and further work is needed on assessing the comparative cost-effectiveness of each of these strategies.

Interventions Supported by the Evidence

The evidence showing the effectiveness of a number of community-based interventions in improving child health is quite strong, and the list is growing. These interventions are shown in Table 2, along with the community-based delivery strategies for promoting or providing them. Multiple independent studies in disparate locations by different investigators confirm the effectiveness of these interventions.

The evidence about the cost-effectiveness of the specific interventions shown in Table 2 is not comprehensive, but current estimates of the cost per disability-adjusted life year (DALY) averted are in the range of \$1 to \$150, except for some water quality interventions that can be more expensive. These estimates make CBPHC interventions for improving child health among the most cost-effective health interventions in existence [32]. By comparison, the cost per DALY averted of anti-retroviral drug therapy for patients with HIV/AIDS is in the range of \$350-\$2,000, considerably higher than for most community-based interventions to improve child health [33]. In terms of criteria developed by the World Bank [34] and the WHO Commission on Macroeconomics and Health [35], these child survival interventions are highly cost-effective. However, as we have noted previously, we need more evidence from longer-term programs implemented at scale in order to be able to make a stronger case for the cost-effectiveness of CBPHC. We also need assessments of the relative cost-effectiveness of the four community-based service delivery strategies, particularly in comparison to their cost-effectiveness when provided in facilities.

Areas for Further Research: Context and Cost-Effectiveness

A significant weakness of the existing evidence is that it is based primarily on small-scale demonstration projects, on small short-term efficacy studies and on studies of single interventions. We are only now beginning to address these approaches issues of feasibility at scale, the conditions necessary for long-term program success in different settings, and the associated cost-effectiveness under these conditions.

Assessment of the scale up of CBPHC programs is still limited, but some experiences have been described [27, 36-37]. There are few examples of rigorous assessments of programs using these approaches after being implemented at scale. The evidence that is accumulating indicates that the bottlenecks to the effectiveness of large-scale programs includes such issues as assuring that the number of community-level workers and their supervisors is sufficient for the population being served, that community-level workers receive adequate support and supervision, and that basic commodities reach down to the community level[38-39]. And, of course, such programs have to be resilient enough to overcome the omnipresent local contextual challenges such as, in the case of one recent report, flooding and gender discrimination[39]. Finally, the evidence which exists at present comes predominantly from South Asia and from rural settings. There is a need for more assessments carried out in Africa and in urban low-income settings.

Practical Implications for Policies and Programs

The following are some practical guidelines for maximizing program effectiveness in improving child health, particularly in high-mortality, resource-poor settings. While these guidelines are not necessarily directly derived from the

evidence of the effectiveness review, they represent lessons learned from those with considerable experience and are consistent with this evidence.

SELECTING THE MOST APPROPRIATE COMBINATION OF INTERVENTIONS

Selection of interventions for a given area should be based on the epidemiological priorities of the area (i.e., the most frequent and readily preventable or treatable conditions causing child mortality) and on the feasibility of achieving high coverage given the available resources, logistical challenges, and contextual constraints. If malaria, for instance, is the leading cause of child mortality, then priority should be given to malaria interventions while at the same time not neglecting other common serious illnesses. Epidemiological priorities vary from by region within countries, so they are best determined from locally derived data, if possible. Overloading the program with too many interventions could possibly lead to lower coverage of services and even reduced program impact than high coverage with a smaller number of highly effective interventions targeted to the local epidemiological priorities.

CBPHC can make a particularly strong contribution where health systems are weak and child mortality is high. Setting up proper health system support for CBPHC in these settings is likely to be far cheaper and less complicated than providing facility-based curative services, with their high costs for manpower, supplies, equipment, and building maintenance. Where health systems are relatively well-developed and child mortality levels are moderate, strengthening CBPHC can provide important additional benefits for children, and even where health systems are relatively well-developed and provide accessible good-quality curative services including referral care to first-level hospitals, strengthening CBPHC can be a cost-effective approach to making the health system even more effective.

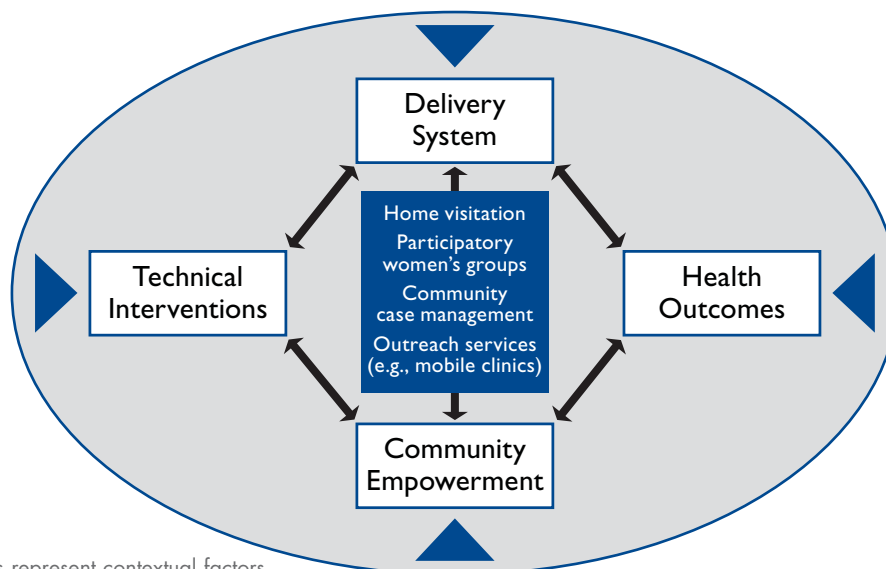
BUILDING PARTNERSHIPS BASED ON MUTUAL TRUST AND RESPECT

Achieving high levels of coverage of key interventions depends partly on the population's confidence in the local health system. If the population does not trust the local health system, high levels of coverage are not likely to be achieved. Trust, respect, and confidence arise over a period of years as people have reason to believe that their health system provides quality services (including treating clients with respect) and reliably provides basic drugs and supplies. Health systems need to ensure that health staffs are present at local health facilities and that they have the training, equipment, supplies and transport needed to support community-level work. For example, mobile health teams based at peripheral facilities need at a minimum steady supplies of vaccines and adequate transport. Additionally, compassionate and high-quality curative and referral care, including basic hospital and surgical care, lends credibility to the community-based work and the workers who provide it. It is important to point out that the literature provides examples of basic and essential hospital care, including surgery, that are that are more cost-effective than is generally assumed [40-41].

Health systems need some type of community-based worker to implement many highly effective interventions and to reach everyone. These workers must be appropriately trained and supported. If they are unpaid volunteers, they must have a limited set of tasks and not be expected to work more than a few hours per week; otherwise, they tend to abandon their responsibilities. An effective procedure must exist for promptly selecting and training new community-based workers to replace those who are no longer functioning in this capacity. Although these decisions are normally made by program leaders in consultation with local communities, examples exist in which communities have taken full responsibility for this process [42].

Among the successful projects and programs that implemented three or more interventions over a period of at least four years, all had strong partnerships with the community. Optimal planning, implementation and assessment of CBPHC programs can benefit from community involvement when program leaders have the capacity to manage this. Frequent dialogue between health staff members and community leaders is a necessary ingredient for building effective partnerships. Mutual respect and recognition of the community as a potential resource to help the health system achieve its objectives are also fundamental for building strong partnerships. The processes required to develop

FIGURE 2. A CONCEPTUAL FRAMEWORK FOR PLANNING, IMPLEMENTING AND EVALUATING THE EFFECTIVENESS OF PROVEN TECHNICAL INTERVENTIONS IN ROUTINE FIELD SITUATIONS AT SCALE



and maintain effective partnerships between health systems and communities vary greatly and depend on the geographic and socio-cultural context. Further research is needed about this topic.

Empowering the community to be a partner with the health system can help strengthen community-based delivery strategies (Figure 2). Home visitation, participatory women’s groups, community case management, and outreach services represent the best delivery strategies for improving child health in high-mortality, low-resource settings. Of course, these four delivery strategies are not the only approaches to implementing interventions that can improve child health, but they are far and away the most common strategies used in programs that have demonstrated improvements in child health as a result of the program interventions in geographically defined populations.

Figure 2 also points to the importance of contextual effects (non-programmatic factors influencing the outcome of interest). These represent a vast “black box” of influences, ranging from socio-economic and political (including the policy environment) to geographic and ecological, over which health programs have no influence.⁵ But in fact, we need to open the box and let in the light in order to be able to deal as effectively as possible with these constraints.

UNICEF’s flagship community-based primary health care program, the Accelerated Child Survival and Development program in West Africa, used several of these community-based service delivery strategies to implement proven child survival interventions in high-mortality, low-resource settings but did not achieve an acceleration in decline of under-five mortality [38]. The program evaluators attributed these findings to the following. (1) The programs did not target the prevention of deaths during the neonatal period, when a substantial number of deaths occur for which effective interventions exist; (2) lack of supportive government policies for community case management; (3) lack of commodities for community-level workers; and (4) lack of supervision and incentives for community-level workers.

This in fact is the kind of rigorous evaluation of large-scale program implementation that we need as a basis for adapting implementation/service delivery strategies to make them as effective as possible. In contrast to most of the evidence reviewed here, the Bryce review did address program performance of multiple interventions together across multiple countries in routine program settings. Progress can be made if we identify the constraints hindering pro-

⁵ Two classic works which address these broader contextual issues are the following: (1) Rosenfield P. 1985. The contribution of social and political factors to good health. In Scott B. Halstead S, Julia A. Walsh, and Kenneth S. Warren (eds.), *Good Health at Low Cost: Proceedings of a Conference Held at the Bellagio Conference Center, Bellagio, Italy, April 29-May 3, 1985, Sponsored by the Rockefeller Foundation*. New York: Rockefeller Foundation, pp. 173-180; (2) Sen A. 2003. *Development as Freedom*. New York: Alfred A. Knopf.

gram effectiveness and make adjustments to overcome these constraints. This is the greatest challenge for today and the foreseeable future.

Summary and Conclusions

The current evidence supports the proposition that the large-scale application of the four strategies highlighted here – home visitation, participatory women’s groups, community-based recognition and treatment (when possible) of serious childhood illness, and health service provision at outreach points – can serve as key elements in an effective health system capable of accelerating the decline in under-five mortality in priority countries. Each of these four strategies requires that the health system establish functional partnerships with community leaders and community members in order to achieve high levels of coverage of proven interventions that reduce child mortality. Learning how to work with communities to develop and strengthen these four effective service delivery strategies should be a priority activity for health systems in areas with high child mortality.

Strengthening CBPHC to improve child health can establish an entry point for developing synergies with community-based approaches for the detection and treatment of HIV/AIDS [43], tuberculosis [44] and malaria [25] and for the promotion of family planning services [45]. CBPHC can help facilitate achievement of all of the health MDGs in high-mortality, high-fertility, and low-resource settings. International cooperation will be important for advocacy, financial support for CBPHC implementation at national and local levels, exchange of information and experiences, building of expertise, and assessment of implementation. Specific mechanisms need to be developed through which experience and new evidence can be captured and used to guide national and international policies and programs.

The review supports the growing recognition that programs in high-mortality, low-resource settings that reach beyond the walls of health care facilities and involve community members as partners have a great potential for further reducing child mortality at low cost. Nonetheless, awareness about the full potential of CBPHC is still not yet widespread, and evidence of the effectiveness of CBPHC at scale in priority settings remains limited. Determining the fit and feasibility of CBPHC strategies and interventions for child health for existing health systems with available resources is the next challenge for country programs. Unleashing the potential of the community to engage as a partner in the process of building effective community-based systems in high-mortality, low-resource settings is one of the great frontiers for global health in the 21st century.

For Further Information

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Acknowledgements

This paper was written by Henry Perry, Paul Freeman, Sundeep Gupta and Bahie Rassekh, who formed the Task Force for the Review of the Effectiveness of Community-Based Primary Health Care in Improving Child Health. We are grateful for the reviews and helpful comments provided on earlier drafts by Koki Agarwal, Robert Black, Steve Hodgins, Nazo Kureshy and Jim Ricca.

This work was carried out by a Task Force of the Working Group on Community-based Primary Health Care (CBPHC) of the International Health Section of the American Public Health Association (APHA). UNICEF, the World Bank, the World Health Organization, and Future Generations all provided financial support that made this work possible. APHA and Future Generations provided administrative support and the World Bank and UNICEF both provided staff that assisted with this project.

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