



Bangladesh: Innovation for Universal Health Coverage 3

Community-based approaches and partnerships: innovations in health-service delivery in Bangladesh

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This is the third in a [Series of six papers about innovation for universal health coverage in Bangladesh](#)

*Dr Islam died in May, 2012

In Bangladesh, rapid advancements in coverage of many health interventions have coincided with impressive reductions in fertility and rates of maternal, infant, and childhood mortality. These advances, which have taken place despite such challenges as widespread poverty, political instability, and frequent natural disasters, warrant careful analysis of Bangladesh's approach to health-service delivery in the past four decades. With reference to success stories, we explore strategies in health-service delivery that have maximised reach and improved health outcomes. We identify three distinctive features that have enabled Bangladesh to improve health-service coverage and health outcomes: (1) experimentation with, and widespread application of, large-scale community-based approaches, especially investment in community health workers using a doorstep delivery approach; (2) experimentation with informal and contractual partnership arrangements that capitalise on the ability of non-governmental organisations to generate community trust, reach the most deprived populations, and address service gaps; and (3) rapid adoption of context-specific innovative technologies and policies that identify country-specific systems and mechanisms. Continued development of innovative, community-based strategies of health-service delivery, and adaptation of new technologies, are needed to address neglected and emerging health challenges, such as increasing access to skilled birth attendance, improvement of coverage of antenatal care and of nutritional status, the effects of climate change, and chronic disease. Past experience should guide future efforts to address rising public health concerns for Bangladesh and other underdeveloped countries.

Key messages

- Three features have distinguished Bangladesh's approach to health-service delivery in the past four decades: (1) application and adaptation of community-based approaches and community health workers at scale; (2) partnerships between the government and non-state organisations; and (3) early and rapid adoption of innovations
- Use and large-scale deployment of community health workers, both by the government and by non-governmental organisations (NGOs), began in the 1970s in Bangladesh, and various models of national scale-up of community health worker programmes have been continuously adapted to meet evolving needs
- The presence of strong national NGO networks, and their willingness to experiment, has been a driving force, particularly for community mobilisation and motivation; NGOs have become key players in health-service delivery
- The Government of Bangladesh has explicitly partnered with NGOs, the private sector, and communities to ensure increased coverage of services and to manage its own limitations in delivery of health services to a growing population. Partnerships have taken on various forms, from informal collaboration to contractual agreements and complementary partnerships in which the government and NGOs work together in complementary roles
- Bangladesh has rapidly adopted and adapted innovative technologies and supportive policies for community-based implementation, with oral rehydration solution being perhaps the best-known example. Social marketing and implementation of a national drug policy have been other key innovative strategies
- Future challenges, including the rise in chronic diseases, the growth of an unregulated private sector, rapid expansion of urban slums, and persistent geographic and economic health inequities, will need continued adaptation of these three unique features of Bangladesh's health-service delivery system. To ensure successful development, the roles of the government, the private sector, and NGOs should be clearly defined to increase accountability and improve policy, regulation, and implementation

Introduction

Since Bangladesh gained independence 40 years ago, it has made unprecedented and rapid progress in several health indicators and outcomes. Many of these achievements, such as reductions in fertility and maternal, infant, and child mortality; high vaccination coverage; and extraordinary uptake of oral rehydration therapy for diarrhoea, are well known and documented.^{1–5} Bangladesh has achieved these outcomes partly because of impressive gains in access to, and high coverage of, selected health interventions, particularly in rural regions. Figure 1 depicts this success compared with other countries in the region.¹² Bangladesh has achieved success in the context of an inadequate health system, restricted resources, and poor governance. These outcomes might be attributed to the way Bangladesh has approached delivery of health services, specifically through innovative (panel 1) community-based mechanisms, and a willingness to experiment with service delivery on a large scale, thus enabling widespread reach.

We identify and describe three features that distinguish Bangladesh's approach to delivery of health services. We assess how the country has experimented with community-based approaches and community health workers; partnership arrangements between the government, non-governmental organisations (NGOs), and the private sector; and innovative policies and technologies that the country has rapidly adopted, adapted, and scaled up through community-based

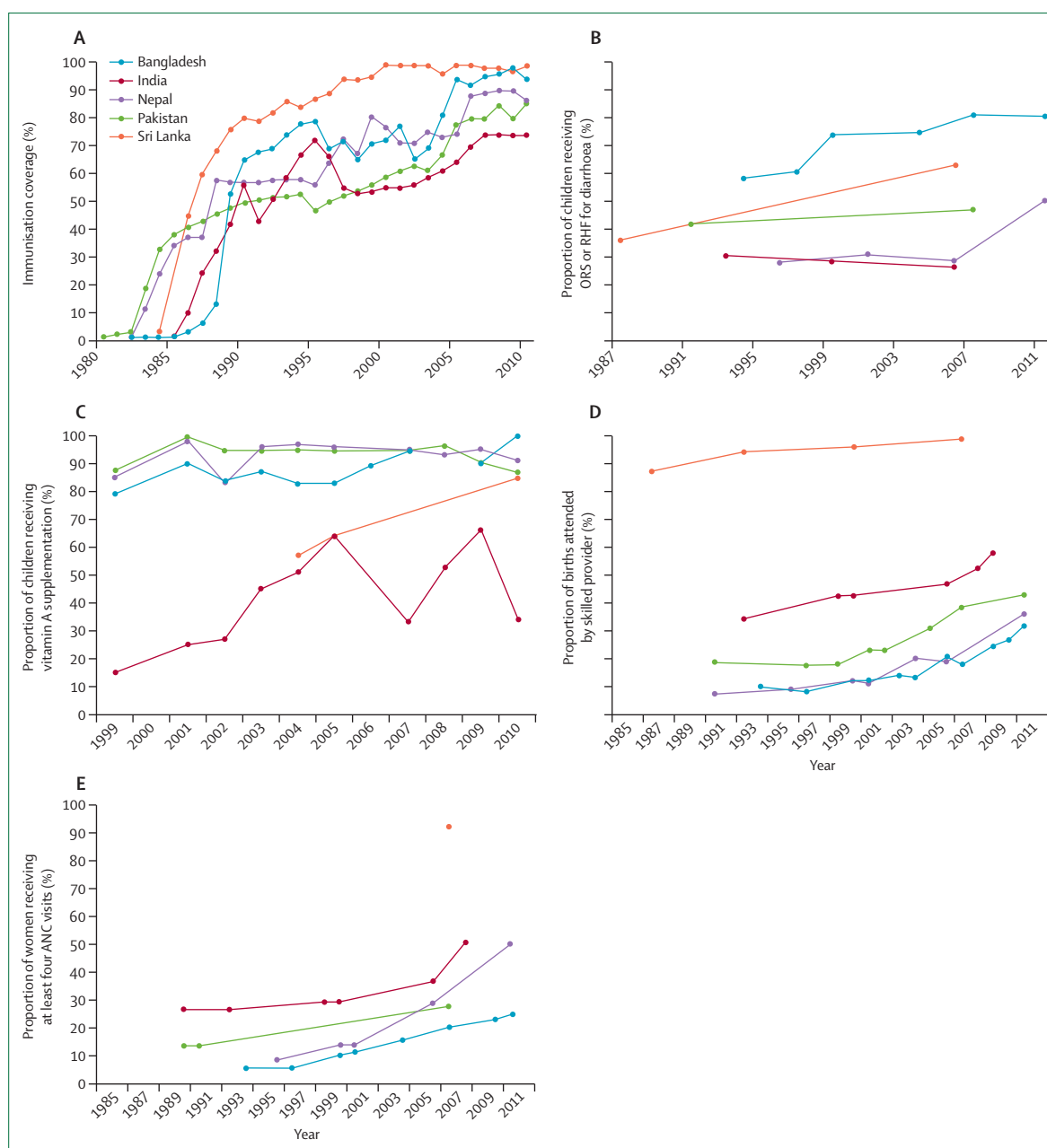


Figure 1: Trends in coverage of selected health interventions in Bangladesh in comparison to neighbouring south-Asian countries

Trends in coverage of measles vaccination in 1-year-olds between 1980 and 2010⁶ (A). Proportion of children younger than 5 (or 3) years with diarrhoea in the 2 weeks before the survey who received ORS or RHF, or both.⁷⁻¹⁰ Data for these countries and years refer to treatment of diarrhoea in children younger than 3 years: Bangladesh in 1994; India in 1992-93, 1998-99, 2001, and 2006; Nepal in 1996, 2001, and 2006; and Sri Lanka in 1987 (B). Trends in rates of vitamin A supplementation coverage in children aged 6-59 months between 1999 and 2010¹¹ (C). Trends in births attended by skilled personnel between 1985 and 2011.^{9,11} Births attended by skilled health staff are the proportion of deliveries attended by personnel trained to give the necessary supervision, care, and advice to women during pregnancy, labour, and the postpartum period; to undertake deliveries unassisted; and to care for newborn babies (D). Trends in ANC coverage in pregnant women between 1985 and 2011^{28,31} (E). ORS=oral rehydration solution. RHF=recommended home fluids. ANC=antenatal care.

approaches to enable the effective delivery of health services. We explore these features by drawing on strategies that have been used to implement key interventions for which Bangladesh has shown exceptional gains in coverage—namely, programmes in

oral rehydration therapy and family planning, the Expanded Programme on Immunisation, and the National Tuberculosis Control Programme. Panel 2 details our search strategy and data sources. The appendix provides a brief overview of how health-

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service delivery has evolved in Bangladesh and the policies and context behind its development.

Panel 1: Forms of innovation in health-service delivery

Innovation can be defined in many ways. Our analysis of innovations in Bangladesh's approach to health-service delivery draws on the definition given by West and Far (1990),¹³ which describes innovation as consisting of three attributes: novelty, intent, and benefit; there is something new or novel about the innovation, it has been purposefully introduced or scaled up, and it brings some benefit to the target population. This definition implies that innovation is not necessarily a new idea altogether, but is new to the context in which it is applied. In this report, we examine and refer to the various forms of innovation—technological, social and adaptive.¹⁴

Technological innovation enables the widespread availability of a cost-effective product and includes the development of drugs, vaccines and diagnostics. Social innovation and adaptive innovation refer to new ways by which to organise human resources, information, and decision making in health systems, and methods for introduction of policies and regulations. Social innovations are needed to maximise uptake and facilitate organised efforts to deliver a service to a large population. Adaptive innovations refer to modifications that have been made to fit the local context. Social and adaptive innovations are not mutually exclusive and therefore cannot be assessed completely independently. Trial and error are hallmarks of social and adaptive innovation, as is the need for implementation research.

These three forms of innovation are essential to ensure improved access to products or services by easing their introduction, uptake, use and sustainability. The political, social, economic and cultural environments are important determinants of whether an innovation is fostered, translated into practice, disseminated, and successful. The case of Bangladesh shows the importance of the political and policy environment in particular, which has been, in comparison to other countries, very open and supportive to experimentation.

Panel 2: Search strategy and selection criteria

Our literature search strategy examined specific approaches to health-service delivery in Bangladesh from the 1970s to the present, with particular focus on primary health care and the family planning, tuberculosis, and oral rehydration therapy programmes, and the Expanded Programme on Immunisation. We searched PubMed, JSTOR, Medline, Embase, ISI Web of Knowledge, and Google Scholar for peer-reviewed articles published between 1970 and 2012. We accessed websites of government, non-government organisations, and international agencies for relevant publications, reports and grey literature. Because this analysis was historical and retrospective, much literature was not available online; therefore, we also retrieved information from books, monographs, unpublished reports, and technical documents available at the International Centre for Diarrhoeal Diseases Research, Bangladesh (icddr,b) and the offices of the Ministry of Health and Family Welfare. We obtained additional literature from references identified in initial sources. We undertook informal discussions with purposively selected key informants to provide a historical context to understand the development and drivers of the expansion of health-service delivery.

Data sources and analysis

Data sources included the Bangladesh Demographic and Health surveys, and other national surveys including coverage evaluation surveys, the Bangladesh Maternal Mortality Survey, census data from the Bangladesh Bureau of Statistics, and UN data. We also obtained data from surveys done previously and from reports held at icddr,b and the offices of the Directorate General Health Services and the Directorate General Family Planning in Dhaka, Bangladesh. We compiled data from these sources and did basic trend analysis.

Experimentation with community-based approaches to health-service delivery

Community-based health workers

Consistent focus on the development of community-based approaches and use of community health workers arose mainly to address the major shortage of human resources in the health sector that has existed in Bangladesh for decades. We refer to community health workers as all community-based workers delivering some form of health service to their communities, although some types might not fit WHO's definition of community health workers exactly.¹⁵ Bangladesh is a country with a severe shortage of public-sector health workers, with a reported shortage of 800 000 workers.^{16–18} The health workforce in Bangladesh is substantially smaller than in other countries, at 0.58 per 1000 population—well below WHO's cut-off for a serious shortage of human resources for health (2.28 per 1000 population).¹⁹ Furthermore, growth in health human resources has been negligible in the past 5 years and the shortage in Bangladesh is larger than that in any other country in south or southeast Asia (unpublished).¹⁷ In view of present population growth of 1.8%, the health-workforce gap will continue to expand if the number of skilled health providers continues to stagnate.

The government and NGOs have consistently trained and deployed community health workers effectively and adaptively throughout the country.^{5,17,20,21} Large investments in these workers were apparent well before the 1978 Alma-Ata conference on primary health care, which garnered international attention and interest in the role of community health workers.⁵ Bangladesh was one of the first countries to develop national-scale cadres of community health workers, beginning with its smallpox and malaria workers in the 1960s, followed by the deployment of oral rehydration workers by BRAC in the 1970s, and the mobilisation of thousands of government family welfare assistants to visit homes, counsel couples, and distribute contraceptives.⁵

Whether the number of community health workers in Bangladesh is higher than in neighbouring countries is unclear. Data from WHO show that Bangladesh has 3.3 community health workers per 10000 population in Bangladesh, which is much greater than in India and Pakistan (0.46 and 0.63, respectively), but lower than in Nepal (6.0).⁶ However, a much higher proportion of workers (9.6 per 10000) has also been documented.¹⁸ Findings from a mapping study showed that the proportion of workers varied widely across the country—from 9.3 per 10000 in Rajshahi, to 22.5 per 10000 in Rangpur. Although government community health workers were distributed fairly evenly (4.3 per 10000 population), those supported by NGOs were not.²² We estimate that in 2011–12, Bangladesh had about 219 000 community health workers (ie, 13.7 per 10000). Of these workers, about 56 000 were government workers (23 500 family welfare assistants, 19 300 health assistants, and 12 991 community

health-care providers),²³ and about 163 000 were supported by NGOs, including 105 631 workers supplied by BRAC²⁴ and 57 680 supplied by other NGOs, mostly in special maternal, newborn, and child health programmes.²²

The strong NGO presence in Bangladesh has directly contributed to the focus on and investment in community health workers. Although almost all NGOs have groups of these workers, we focus on BRAC because it has the largest community health worker programme in the country and is a good example of the important contributions that NGOs in Bangladesh make in creating a strong community health workforce.

BRAC was one of the first organisations to set up a programme for volunteer community health workers in Bangladesh in the 1970s.²⁵ BRAC's original community health workers were trained male paramedics who treated minor illnesses in return for a small referral fee.²⁶ On the basis of important lessons learned about remuneration, supervision, and accountability from this early experience, BRAC adapted and effectively scaled up. Figure 2 shows that whereas the number of government community health workers remained unchanged from 2000 to 2008, the number of BRAC Shasthya Shebikas (the largest category of BRAC community health workers) increased rapidly in response to insufficient access to basic community health services. The number of Shasthya Shebikas increased from 1080 in 1990, to 91 000 in 2011 across all 64 districts.^{27,32} The Shasthya Shebikas are an impressive force in terms of numbers, geographic coverage, and rapid mobilisation, and presently visit 18 million households every month.³³ The increase in government community health workers until 2011 (figure 2) is attributable to the introduction of a new group of workers—the community health-care providers—who are stationed at the new lowest tier of health facilities at the village level (ie, community clinics).

Until recently, the roles of NGOs and their associated groups of health workers were limited to community mobilisation, motivation and awareness raising, and creation of linkages between poor households and facility-based care,³⁴ rather than being direct providers of health services. This situation is now changing. BRAC's Shasthya Shebikas are now a key source of antenatal care; they provide 8·1% of antenatal care services in the country compared with 7·5% provided by government community health workers.¹

Although many countries have implemented community health worker programmes, Bangladesh is one of few that has successfully scaled up and sustained its community health workforce.^{15,35} Routine, systematic home visitation became a unique characteristic of community health worker programmes very early on in Bangladesh when its effectiveness was shown through research trials of cholera vaccines in the 1970s, and later for maternal and child health and family planning services in the Matlab subdistrict.³⁶ This feature is an example of a social innovation, resulting in high coverage

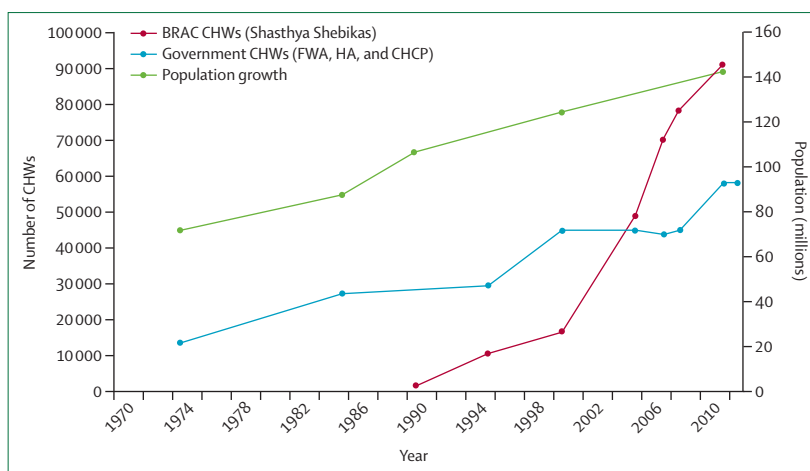


Figure 2: Expansion of government and BRAC community health workers (CHWs) in Bangladesh relative to population growth, 1974–2012^{27–31}
FWA=family welfare assistant. HA=health assistant. CHCP=community health-care provider.

of many health interventions and a reduction in fertility and childhood and maternal mortality.

An unusual feature of community health workers in Bangladesh is the number of models that have been developed by the government, NGOs, and the private sector to address the changing needs of the country. The diversity of national community health worker programmes trialled in Bangladesh might have begun earlier than in any other country.¹⁵ Bangladesh has tested different organisational and management structures with community health workers in terms of their tasks, incentive systems, and management and supervisory mechanisms; some of which have been more successful than others. Although national surveys show that community health workers might not be major contributors to delivery of specific services, they have an important role in outreach and in health promotion and prevention. The table shows several examples of groups of community health workers, with a focus on those that have been scaled-up across Bangladesh.

Another discerning feature of community health workers in Bangladesh is the continual adaptation and modification of their roles in response to changing needs. The roles of workers in smallpox and malaria in the 1960s were adapted and reassigned in the mid-1970s to fill those of government health assistants.⁴¹ Furthermore, government community-based skilled birth attendants were recruited from existing family welfare assistants and female health assistants.⁴⁰

The rapid expansion of community health workers in Bangladesh has enabled the broad dissemination of interventions including contraceptives, oral rehydration solution, and vaccinations. The example of BRAC's oral rehydration workers going from house to house to teach women to make the oral rehydration solution from ingredients at home is perhaps the most well known example of how community health workers played a part

in the widespread dissemination of an innovation that was adapted to the local context and introduced to each household.³⁶ Several reviews of community health workers show their capacity to positively affect child mortality and survival.^{41–45}

Another important effect of community health workers is their role as community change agents. The workers

make important contributions to social capital and build networks, partnerships, and trust with their clients. The effect of the work of government family welfare assistants ranges from provision of contraceptives, to having an effect on contraceptive behaviour, to improving the health status of women.^{46,47} Moreover, the emphasis on community health workers shifts accountability to the

| | When introduced | Number of community health workers | Selection criteria | Payment | Training | Tasks | Population served | Supervision | Notable features |
|--|-------------------------|---|---|--|---|---|---|---|--|
| Oral rehydration workers (NGO) | 1979 (now stopped) | Gradual scale-up, from 20 original workers to 450 by 1990; expansion followed trials and modifications to reach every household in Bangladesh | Local female community members; minimum 10 years of schooling; no children younger than 1 year | Paid by number of household visits undertaken and effectiveness of their teaching; ³⁷ bonus received based on the accuracy of mothers' recall ³⁸ | 5 days | Teach women how to prepare and deliver home-made oral rehydration solution, and teach them the so-called ten points to remember in management of diarrhoea | NA | Teams of 14–16 people; one supervisor to between six and eight oral rehydration workers; individuals are constantly monitored, given refresher training, and undergo regular supervisory checks | Pioneering example of employment of local women; after the Oral Therapy Extension Programme, oral rehydration workers were used for new interventions such as immunisation and vitamin A promotion |
| Family welfare assistants (Government) | 1976 | Gradual scale up over many years 23 500 (2013) ²³ | Female; 10 years of schooling | Salary of 7675 BDT (US\$98) per month ¹⁸ | 21 days plus on-the-job training on the Expanded Programme on Immunisation, family planning, acute respiratory infections, and tuberculosis | Visit households every 2 months; registration of couples, motivation for family planning, distribution of contraceptives, and referral of clients for antenatal care and postnatal care | One per 4000–5000 population | Male supervisors meet twice per month | Male supervisors cannot accompany women to observe their work |
| Shasthya Shebikas (NGO) | 1972; scaled up in 1990 | 91 000 ²⁷ (2011) | Married; older than 25 years; no children younger than 2 years; 10 years of schooling; nominated by community; member of a BRAC-sponsored village organisation ^{32,39} | No salary; performance-based incentives that are linked to commodities and services provided | 15–20 days; monthly refresher training | Visit a household once a month; disseminate health messages; register pregnancies; identify patients with tuberculosis, treat common illness; sell commodities | 200–250 households; visit 15 households per day ³² | A female supervisor for ten Shasthya Shebikas; supervisors meet with Shasthya Shebikas once a month | Shasthya Shebikas have contributed to improvement of coverage of antenatal care, tuberculosis treatment, and treatment of childhood illness |
| Health assistants (Government) | 1995 | 4500 in 1995 20 815 presently sanctioned posts ²⁹ | Male or female; 12 years of schooling | Salary of 8000 BDT (US\$103) per month | 21-days plus on-the-job training on the Expanded Programme on Immunisation, family planning, acute respiratory infections, and tuberculosis | Provision of immunisations, packets of oral rehydration solution, and vitamin A capsules; occasional home visits every month to promote use of oral rehydration solution and to treat acute respiratory infections, tuberculosis, and malaria | One health assistant serves a population of 6000 people | Supervised by assistant health inspectors, who are all men; each assistant inspector supervises five to six health assistants | Adapted from malaria and smallpox workers of the 1960s; assistants work at village level, but are based at subdistrict level |
| NGO-supplied family planning community health workers (USAID-funded) | NA | Varied by programme | Varied by programme | Varied by programme | Varied by programme | Varied by programme | Varied by programme | Varied by programme | Important contribution at a crucial time for national family planning coverage; carefully developed partnership with the NGO family planning community health workers, which complements government family welfare assistants; |

(Continues on next page)

| | When introduced | Number of community health workers | Selection criteria | Payment | Training | Tasks | Population served | Supervision | Notable features |
|---|-----------------|---|---|---|--|---|--|--|--|
| (Continued from previous page) | | | | | | | | | |
| Community-based skilled birth attendants (Government) | Since 2003 | Scaled up since 2004; ²³ 6155 skilled birth attendants (2011); ²³ aim is to create 13 500 positions by 2015 | Selected from existing government family welfare assistants and health assistants; aged 45 years or less; certificate for 10 years of schooling | Received original salary from family welfare assistant or health assistant role ¹⁸ | 6 months of midwifery training; 9 months of supervised work experience; an additional 3 month course; ²³ receive certificate recognised by the Bangladesh Nursing Council ⁴⁰ | Do clean home deliveries; recognise and refer complications | One attendant per 6000–10 000 population Programme; coverage has been poor (2–4% of births in catchment areas) | Expected to be supervised by family welfare visitors who received training in midwifery, ⁴⁰ but the supervisory and monitoring system has been quite weak ¹⁸ | Selected from existing government-employed health assistants and family welfare assistants; expected to continue duties as family welfare assistants and health assistants |
| Community nutrition promoters (NGO) | 2003–10 | 36 764 volunteers | Local female community members; aged between 18–30 years; two children or less; minimum 8 years of education | 1500 BDT (US\$19) per month | 21 days of training | Run a nutrition clinic 6 days a week; Nutrition promotion, growth monitoring, and supplementary feeding | One per 1000–1500 population | One supervisor (community nutrition organiser) to ten promoters | .. |
| Community health-care providers (Government) | 2010 | 12 991 community health-care providers recruited ²³ (90% women); aiming for a total of 13 500 | 12 years of schooling; local resident; capable of operating a computer | Salary of 8550 BDT (US\$110) per month | 12 weeks' basic training (6 weeks' theoretical and 6 weeks' practical) | Provision of antenatal and postnatal care; management of acute respiratory infections, diarrhoea, anaemia; provision of injectable contraceptives | One provider per community clinic per 6000 population | Supervised by a subdistrict hospital manager | Positioned two levels higher than health assistants and family welfare assistants; do not belong to any specific group of the government health department |
| National nutrition service volunteers (Government) | Planned | NA | Female and selected from the community | NA | NA | Growth monitoring; nutrition, education, and counselling; micronutrient supplementation; supplementary feeding; deworming | NA | Supervised by the community health care providers | .. |

NGO=non-governmental organisation. NA=not available. BDT=Bangladesh Taka.

Table: Key attributes of selected examples of types of community health workers scaled-up nationally in Bangladesh since 1971

community level, transferring some responsibility of health-service delivery to civil society rather than government.

Substantial challenges exist regarding sustainability and retention of community health workers. The annual dropout rate for Shasthya Shebikas was 12% in 2008.³⁹ Previous studies reported drop-out rates of up to 44%.⁴⁸ One important lesson learned from BRAC's experience is the importance of provision of basic training and ensuring of routine supervision.⁴⁹ Incentive systems are also crucial for the effectiveness and sustainability of community health-worker programmes^{39,50–52} because more favourable income-generating opportunities can encourage dropout of these workers.

Community-based approaches

The Bangladesh family planning programme

Experimentation with community-based approaches in Bangladesh, particularly with community health workers

at the centre of outreach programmes, is evident in some of its most successful and notable programmes, and is a common theme that is unique to Bangladesh's approach. Three community-based programmes show how Bangladesh has achieved large-scale coverage through community-based outreach.

The Bangladesh family planning programme, started in 1953, is one of the oldest in the world. The first public family planning programme was started by the government in 1960 and used an outreach programme through so-called village aides to counsel couples; however, it was soon abandoned because of its minimum effect, which was attributed to poor training and inadequate supervision and resources.²⁸ In 1965, the first comprehensive family planning programme was started, also based on outreach, with so-called lady family planning visitors and male organisers and a focus mainly on promotion of intrauterine devices, sterilisation, and condom distribution. Despite its small effect, this programme successfully raised awareness

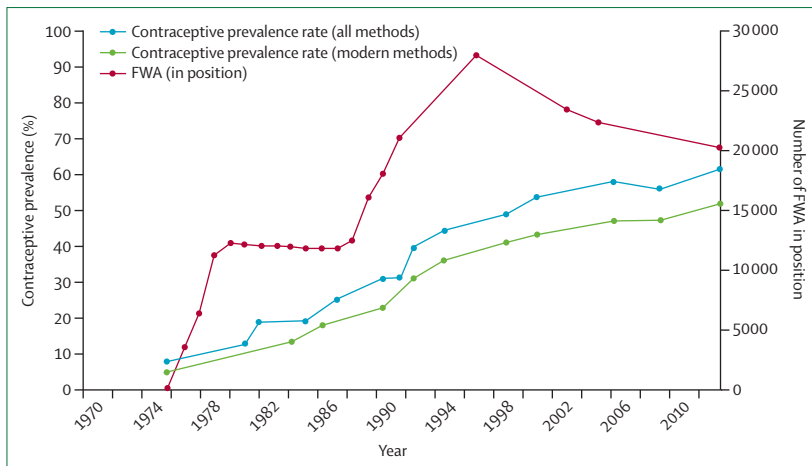


Figure 3: Trends in contraceptive prevalence alongside growth of government community health workers (FWAs) providing family planning in Bangladesh, 1970–2011^{2,5,8,64}

Doorstep delivery of family planning by FWAs stopped in 1997, then resumed in 2004. Furthermore, by 1990, about 10 000 field workers of non-governmental organisations were in place, undertaking similar roles to FWAs. FWA=family welfare assistant.

and these workers were enlisted in later family planning efforts once Bangladesh gained independence.

The present family planning programme in Bangladesh began in 1977 as an experimental pilot project in the Matlab subdistrict, with young, educated women to provide family planning services directly to the homes of couples. The effect on fertility reduction was noted almost immediately. After testing and modification to assess feasibility and success, the programme was gradually scaled up across the country through existing government systems.⁵³ The original experimental pilot project became known as the Matlab maternal and child health and family planning extension project (1983–86), and was the basis for several changes made to organisational aspects of the national programme.^{28,54,55} Every subsequent change was pretested in extension regions before being added to the national programme. This approach led to deployment of thousands of full-time female fieldworkers (family welfare assistants) under the family planning wing of the Ministry of Health and Family Welfare. Each family welfare assistant undertook community-based distribution of family planning methods through household visits every two months in her catchment area of about 4000 people.^{5,56} With the supervisory mechanisms in place, coverage and intensive follow-up underscored much of the success of this approach.

The large deployment of front-line female workers in the conservative cultural environment of the time was regarded as a bold step by the government. NGOs also played a great part in mobilising community participation and support for family planning.⁵⁷ The programme legitimised use of modern methods of birth control and lowered the cost of contraception.⁵⁸ Doubts were raised that changes in fertility behaviour could take place with no improvement in socioeconomic conditions; however,

substantial gains in contraceptive prevalence were recorded, with increases from 8% in the 1970s to 62% in 2011.^{2,12,59} The subsequent reduction in fertility exceeded expectations in view of the level of extreme poverty, low levels of female education, and persistent young age at first marriage.⁴ Bangladesh went from having one of the highest fertility rates in the world in 1971, with a total rate of 6·3 births per woman, to its present rate of only 2·3⁸—a rate not noted in other countries with similar levels of development.⁶⁰

The delivery of family planning services to the doorstep of the community has been the most important innovation behind fertility reduction, enhancing contraceptive uptake and altering societal attitudes towards small family norms in the absence of similar improvements in economic conditions.^{5,61} Between 1978 and 1997, 85% of all oral contraceptive pills dispensed in rural Bangladesh were provided via doorstep delivery (through family welfare assistants).⁴⁶ Contact with a field worker was one of the most important predictors of contraceptive adoption⁶² and could reduce discontinuation and sustain contraceptive use.⁶³ Poverty, low female autonomy, and cultural restrictions on the mobility of women meant that outreach services to the household was the most effective strategy for delivery of contraception to women in rural regions. Figure 3 shows how trends in rates of contraceptive prevalence increased alongside increases in community health workers providing family planning. The subsequent introduction and rapid expansion of social marketing of contraceptives also played a large part in increasing demand and acceptance of contraceptives, and importantly, its ability to reduce inequities in access to such commodities.^{65,66}

The present situation has changed. Many social and cultural barriers to access and use of contraceptives have diminished, which suggests that a tipping point has been reached and that sustained demand for family planning exists. This change shows that the dependency on health workers for supplying contraceptives at home could be reduced. Evidence shows that contact with family planning community health workers has reduced substantially, and social marketing outlets, such as pharmacies and medicine shops, are now the most common source of contraceptives (33%), followed by government family welfare assistants (23%).² After 2000, the proportion of women obtaining contraceptives from pharmacies overtook the proportion obtaining contraceptives from government community health workers (figure 4).

The oral rehydration therapy programme

The Oral Therapy Extension Programme in Bangladesh was at one point the largest oral rehydration therapy programme in the world. It began in 1979 as a collaboration between BRAC and the government. BRAC-trained community health workers (so-called oral

rehydration workers) visited every rural household in the country to teach mothers how to prepare home-based oral rehydration solution.³⁷ This approach was based on the belief that teaching of mothers would increase their capacity to manage their children's diarrhoea, thus empowering women and demedicalising treatment. This strategy, eventually paved the way for additional community-based approaches for the management of other disorders (ie, oral antibiotics for childhood pneumonia⁷⁶ and most recently, oral misoprostol for prevention of post-partum haemorrhage^{77,78}). Until the Oral Therapy Extension Programme, the perception was that illiterate women could not learn how to use oral rehydration therapy effectively and efficiently.⁷⁹

On the basis of strategies developed through intensive assessment of pilot projects, operations were gradually scaled-up in three phases. Phase 1 (1980–83) began in five districts covering 2.5 million households, followed by an additional 5 million households in phase 2 (1983–86). After completion of phase 3 in 1990, 90% of mothers in 12.5 million households reached by the programme knew how to prepare oral rehydration solution.³⁷ Strong monitoring and assessment of the programme allowed for early identification of weaknesses that could be addressed before scale-up to the next level. Scale-up included organisation of the workers into a system with strong supervision, supervisor accountability, and local autonomy.⁸⁰ Innovative strategies, such as the incentive salary system, aided improved management of the programme.³⁷ The use of oral rehydration solution for treatment of diarrhoea in Bangladesh increased nationally from 1% of all cases in the 1980s to 40% in 1993.⁵ The country presently has the highest usage rates of oral rehydration solution in the world,⁸¹ with a reported 81% of children with diarrhoea given oral rehydration therapy in 2011⁸ (figure 1). Consequently, in the past 17 years the proportion of under-5 deaths attributed to diarrhoea has decreased. Between 1988 and 1993 almost a fifth of under-5 deaths were due to diarrhoea. This proportion reduced substantially during 2007–11 to only 2%.²⁷

The Expanded Programme on Immunisation (EPI)

The EPI—one of the most successful health interventions in Bangladesh and the largest single contributing factor to reductions in under-5 mortality⁴—is another example of large-scale coverage achieved through community-based outreach that evolved to meet changing conditions. Initially, the programme was largely delivered through government health workers, but by the 1990s many NGOs joined as partners in the programme, playing a crucial part in mobilising the community to attend EPI delivery sites.

The national immunisation programme in Bangladesh began in 1979, with services initially only available through district and subdistrict level facilities. However, this approach made little progress in raising of coverage, which remained well below 5%.^{82,83} In 1985, the national

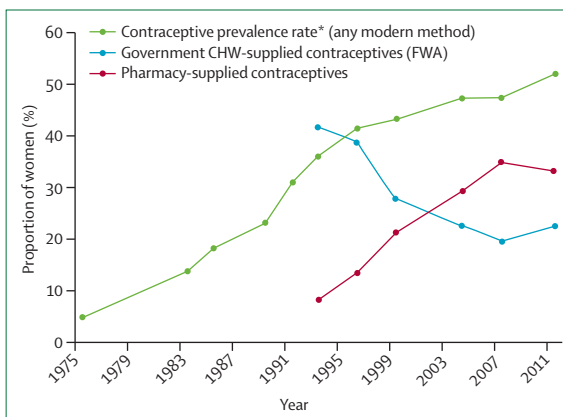


Figure 4: Trends in source of supply of modern family planning methods for presently married women in Bangladesh, 1975–2011^{2,8,67–75}

Source of family planning method refers to most recent source of method. Modern methods refer to the contraceptive pill, intrauterine devices, injectables, norplant, vaginal methods, condom, and female and male sterilisation. CHW=community health worker. FWA=family welfare assistant. *Proportion of presently married women aged 10–49 years using specific modern family planning methods; data for 2007 and 2011 is restricted to presently married women aged 15–49 years.

immunisation strategy and programme were completely revamped with extensive funding and technical support from donors, with a target to achieve universal childhood immunisation by 1990. EPI became a major component of maternal and child health interventions in the primary health-care approach of the third 5 year plan (1985–90). The national programme office (EPI headquarters) remained in charge of design and planning, management, procurement and distribution of vaccines and other supplies, and monitoring and evaluation. The delivery of vaccines was integrated into the country's primary health-care system, and immunisations were provided almost entirely by government community health workers (health assistants) through a new and systematically designed outreach system. The redesigned programme also required that the community contributed space to accommodate the outreach vaccination services.

Reorganisation of service delivery to increase access followed findings showing that women would not access immunisation services if they had to travel long distances.⁸⁴ Rapid increases in immunisation rates were subsequently reported. By 1989, near universal access to immunisation services was reached⁸⁵ and immunisation coverage escalated from less than 2% in 1985, to 65% in 1992.^{5,86} By 2010, national immunisation coverage had reached 82% and almost 90% of immunisations were provided by government outreach services. The role of NGOs in mobilisation of the community to attend EPI services was an important factor contributing to the success of the programme.⁵

Experimentation with partnerships for health-service delivery

The government has consistently expressed an openness to the development of partnerships with NGOs, the



Figure 5: Growth in funding given to NGOs and number of NGO projects registered and approved by the NGO Affairs Bureau of Bangladesh, 1990–2011⁸⁹
 NGO=non-governmental organisation.

private sector, and communities, to deliver health services and related activities; a topic referred to by other papers in this Series.^{12,25}

Bangladesh hosts one of the largest and most dynamic NGO sectors in the developing world. The emergence of NGOs ensued after the 1971 independence war, during which they were mainly involved in relief efforts.⁵ At that time the government, realising its own limitations in meeting the population's health and family planning needs, actively reached out to NGOs to assist with service provision and social mobilisation. Numbers of NGOs increased slowly in the mid-1970s and accelerated in the 1980s. Government support of NGOs is shown in the second 5 year plan (1985–90; appendix), in which the organisations were regarded as collaborative partners in the achievement of health and development goals.⁸⁷ NGOs flexibility and ability to work effectively at the community level and target hard-to-reach populations has been instrumental to the government's commitment to NGO collaboration.

Successive governments in Bangladesh have maintained a supportive policy environment with very few constraints and regulations for NGOs to operate, thus lending support to their expansion.³⁴ As of July 2013, 2252 NGOs were registered by the government's NGO Affairs Bureau.⁸⁸ Other sources document the existence of more than 23 000 NGOs, of which more than 4000 work in the health, population, and nutrition sector.⁵ Foreign funding to NGOs increased from US\$180 million annually in the early 1990s, to \$380 million during 2003–04.³⁴ The number of NGO projects in Bangladesh has grown concomitantly, from less than 500 in 1990 to more than 18 000 in 2011 (figure 5). A 2003 World Bank survey showed that provision of health services was the second most common area of service activity after microcredit, with nearly 60% of NGOs providing health-care-related services.^{34,90}

Over time, the government has expanded its range and nature of partnerships with NGOs, in recognition that it cannot and should not do everything in terms of service delivery. These partnerships can be grouped into three general categories. First, complementary or collaborative partnerships in which the government and NGOs work together on the basis of shared objectives and agreed roles. For example, NGOs were given defined tasks in the national EPI and tuberculosis programmes.²⁵ During the early stages of family planning programmes, NGOs, especially USAID-funded groups, worked in communities where government community health workers or facilities were scarce to minimise gaps in service delivery. Second, contractual partnerships, in which the government completely outsources public-sector services to NGOs, as shown with the Urban Primary Health Care Project, an initiative to provide basic primary health care to the urban poor in major urban regions in Bangladesh.⁹¹ Beginning in 1997, this project was one of the first large-scale attempts in Asia to contract out primary care services to NGOs.^{5,25} Third, informal partnerships, whereby the government gives space and allows private organisations to provide a service that the government does not, for example with the Diabetic Association of Bangladesh for the management of diabetes.

Below we expand on three of the most successful and long-standing partnerships.

The Bangladesh EPI

In 1985, the government of Bangladesh sought assistance from several NGOs, including BRAC, CARE, and Rangpur Dinajpur Rural Service to fulfil its goal of universal childhood immunisation by 1990. The rapid increase in coverage in the late 1980s and early 1990s during EPI intensification happened at a time when involvement of NGOs in EPI peaked.⁹² Partner NGOs were engaged at three specific levels: (1) at the national EPI office to which they provided technical assistance on training, programme support and monitoring, and community mobilisation; (2) at the upazila level at which they provided programme management and monitoring support to upazila managers; (3) and at the community level for community mobilisation and promotion of attendance at government EPI outreach sites. BRAC and CARE each placed staff at EPI headquarters to assist with supervision, programme planning, and monitoring.⁸⁰ In urban regions, NGOs managed most immunisation services in the absence of adequate numbers of government providers, which is still the case.⁵

Additionally, the Bangladesh Government has partnered with private providers and civil society to ensure widespread uptake and acceptance of its EPI programme. Community mobilisation was pivotal, especially in support of national immunisation days, which have been running almost every year since 1995 for the distribution of oral polio vaccine and vitamin A

capsules. More than 600 000 volunteers participate during these events reaching more than 90% (17 million) of children in a day.⁵ The EPI programme presently operates in collaboration with about 20–25 NGOs.⁹²

The National Tuberculosis Control Programme

In 1991 the government reorganised its tuberculosis programme and created the National Tuberculosis Control Programme within the Directorate General Health Services, and began to initiate partnerships with NGOs. Presently, the government delivers its directly observed treatment short-course strategy for tuberculosis control through ten NGOs, the two major ones being BRAC and the Damien Foundation.⁹³ Presently, 44 collaborating partners exist, many of which are non-implementing partners that provide technical and research support. These collaborations are based on a memorandum of understanding developed in 1995 with the Ministry of Health and Family Welfare and outlines specific tasks in defined areas for participating NGOs, and seeks to avoid duplication of efforts.⁹⁴ In each upazila, either the government or an NGO is responsible for the tuberculosis programme, and over time, NGOs have taken responsibility for an increasing number of district-level tuberculosis programmes. The National Tuberculosis Control Programme directs all activities of partners and leads the partnership. NGOs agree to follow operational and technical guidelines established by the government and to support government by training its staff.⁹⁵ Importantly, the programme allows NGOs to experiment with original approaches to improvement of service delivery. One example includes a novel approach to procure and supply tuberculosis drugs that are supported by NGOs to prevent delays in delivery and absence of stock.⁹⁶

BRAC and the Damien Foundation together cover 80% of the programme population, with more than 67 000 BRAC community health workers (covering a population of 82 million) and 16 000 village doctors supported by the Damien Foundation (covering a population of 26 million), providing community-based outreach for tuberculosis control.⁹⁶ The Damien Foundation uses village doctors in tuberculosis case detection and treatment and a key feature of this programme is the close supervision and monitoring by NGOs.⁹³ The rate of tuberculosis case detection in BRAC-served regions is 80%—higher than the national detection rate (71%). BRAC's rates of treatment success have likewise been consistently higher than the government's (figure 6).

The government has further expanded its partnerships for tuberculosis control to the corporate and business sector. It signed a memorandum of understanding with the Bangladesh Garment Manufacturers and Exporters Association (BGMEA), which employs more than 3 million (mostly female) workers in the country to establish specialised directly observed treatment short-course centres within BGMEA health centres.¹⁰¹

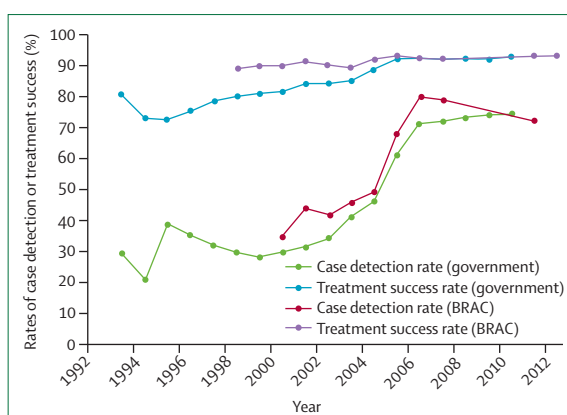


Figure 6: Trends in tuberculosis case detection and treatment success rate in government and BRAC-served regions in Bangladesh, 1993–2012.^{24,27,97–100} Case detection rate is the ratio of the number of notified tuberculosis cases to the number of incident cases in a given year. Treatment success rate is the proportion of patients treated.

Diabetic Association of Bangladesh (BADAS)

BADAS was founded in 1956 as a not-for-profit health-care organisation that emerged out of necessity to provide care for patients with diabetes who needed long-term care not available in the public sector. The association concentrated on creating its own health-care institutions. Together with its affiliated associations, BADAS owns more than 90 health-care facilities across the country, with 3000 beds and more than 1.6 million registered diabetics in its care.¹⁰² BADAS is now the largest health-care provider after the government. Although not an explicit partnership, the government has allowed and supported BADAS to grow and expand its range of services.

Engagement in partnerships with NGOs has been an effective strategy to expand coverage of health services and to address deficiencies in health human resources. The generally healthy and reciprocal collaborations between the government and NGOs are unique to Bangladesh, and are shown in the increasing proliferation of NGOs and the successes they have been able to achieve to this day.

Early adoption of innovations

Bangladesh has been an early adopter of innovative approaches, policies, and technologies relevant for the developing world. When WHO advocated that countries implement national drug policies in 1975, Bangladesh was the first to respond and pass such a policy in 1982.¹⁰³

An internationally renowned research institution, the International Centre for Diarrhoeal Diseases Research, Bangladesh (icddr,b) has contributed much of the research and experimentation for many innovations; most importantly, for the development of oral rehydration solution and the design of community-based family planning programmes. Oral rehydration solution is a good example of a technological innovation, and exemplifies social and adaptive innovation in the way it was adapted, implemented, and scaled up. The national

drug policy and use of social marketing are other well-known examples of social and adaptive innovations rapidly taken up and scaled up across the country to improve health outcomes by the enhancement of knowledge and awareness about, and increasing of

availability and access to, essential medicines, in particular by making antibiotics cheaply and widely available. The appendix details an analysis of the early initiation and rapid uptake of these innovations.

Panel 3: Community Clinics: an innovation in community-based health-service delivery in Bangladesh

Background and rationale

In 1996, the Government of Bangladesh extended its primary health-care services to deliver local health care and family planning to rural regions by establishment of 18 000 community clinics across the country. Community clinics were designed to replace home-based and other outreach services at the community level, with services provided from a fixed point. This one-stop provision of a facility-based package of essential services was intended to improve efficiency of service provision by replacement of service delivery at the household level, which was both labour intensive and restricted in the range of services it could provide.¹¹¹ The intent of community clinics was to provide a sustainable, accessible, community-owned service.

Design and reach

Community clinics were to be open from 9 am to 3 pm 6 days a week, and bring family planning, preventive health services, and selected curative services closer to the population at the village level. Each clinic was to serve 6000 people, and their location would make them accessible to 80% of the population and be within 30 min walking distance.¹¹² The plan was to construct 13 500 community clinics whereas the remaining 4500 were to operate from within the existing health facilities at upazila and union level. By 2001, 10 723 CCs were constructed, of which 8000 started functioning. After a change of government in 2001, all community clinics were closed and remained so until the present Awami League government returned to power in 2008. Since then, revitalisation of the clinics has been a priority project in the health sector. As of 2012, 11 816 community clinics had been made functional again.^{23,98}

Community ownership and participation

From the outset, communities were to be involved in designing, planning, monitoring, and implementation of community clinics. The community was to donate the land in a suitable location and to assist in construction of the clinic, whereas funds for building of the clinics, and for provision of staff and other supplies were supplied by the government. Furthermore, community groups were required to be set up to support and assist with the management of the community clinic—a community group and a community clinic support group. Their main functions were as links between service providers and users, and to motivate the community and assist with maintenance of the community clinic. This strategy was expected to generate a degree of ownership of the community.

Human resources and supplies

One community health-care provider is appointed as a full-time service provider for each community clinic.²³ Furthermore, one health assistant and one family welfare assistant are posted in each community clinic to provide health and family planning services 3 days per week. Each clinic would be supplied with 23 essential drugs to treat common illnesses.²³ Staff from community clinics are expected to continue providing a small range of outreach services. Managers from the subdistrict-level hospital would visit regularly and provide additional services and supervise the clinic staff.

Concerns and challenges for the future of community clinics

Community clinics have been underperforming and use has been poor. Many clinics are poorly constructed and maintained; additionally, shortages of drugs and equipment have been reported.¹¹³ The formation of community groups and community clinic support groups has faltered.¹¹³

Lessons and directions for the future

Commitment to expansion of access to priority basic health services, and willingness to experiment with delivery strategies and technologies at the community level, and to scale-up the most successful methods in partnership with NGOs and the private sector, has enabled Bangladesh to achieve remarkable coverage levels of interventions. Although Bangladesh is one of the few countries on track to achieve Millennium Development Goals 4 and 5 on maternal and child mortality,^{104,105} further innovations are necessary to sustain the rate of declines and improvements noted in the past and to manage future health challenges. The government should clearly define its roles as a policy maker, regulator, and implementer if Bangladesh is to meet these future challenges.

A key challenge is the wide variety of training, capabilities, support, and supervision of community-level workers dependent on which establishment is responsible for them. The types of community health workers trained to manage acute disorders are varied and lack coherence in terms of training and remuneration at a time when increased integration and continuity is needed. In addition, workers have found it difficult to compete with village doctors. These largely unregulated private providers have rapidly grown in numbers in recent years, and have become the first line of care for many poor people.^{18,106} The situation is further complicated by the recognition that many community health workers become village doctors over time.¹⁷ In view of the large role of local drug sellers in providing family planning, oral rehydration solution, and other pharmaceuticals in Bangladesh, the government should build on its long experience with partnerships to experiment with innovative approaches to regulate the private sector that take advantage of citizen's groups and industry.¹⁰⁷

As the population of Bangladesh ages and chronic and coexisting disorders become an increasing burden, new approaches will be needed to provide community health workers and village doctors with a different set of preventive and curative capacities and incentives. These individuals should be firmly established and integrated as a foundational and permanent element within the health system rather than as a temporary solution to a short-term need.¹⁰⁸

The shortage in health workers has been exacerbated by geographic inequities in distribution of health workforces; rural regions, in particular hard-to-reach and poor regions, suffer greater shortages because qualified doctors and nurses are concentrated in urban regions.^{18,109} This imbalance has led to a proliferation of informal and unqualified health providers who now serve 80% of the rural population.^{17,25,110} The number of village doctors in

particular has expanded in the past few years, many of whom were previously working as government family welfare assistants. The expansion of informal providers and drug shops has resulted in increased access to pharmaceuticals in nearly all parts of the country. Consequently, the simpler issue of limited access to medicines at the time of independence has been replaced by the more complex issue of inappropriate use and unaffordable costs of medicines.

The continuously evolving physical infrastructure of Bangladesh has changed substantially since the start of its community-based approach. Road networks have improved, mobile phone coverage has increased, and women are willing to travel outside their home for health services. The role for community-based workers should also evolve to adapt to these advances; one change will be for workers to have an increased role in surveillance and in improving linkages and referrals to facilities, thus shifting the focus away from service provision. Provision of appropriate incentives for community health workers will need continued innovation because women increasingly have access to alternative economic opportunities, particularly in urban regions. The ability to experiment and adapt has been the hallmark of the pathway of growth for NGOs, and this might be their greatest asset in facing these new challenges.

Bangladesh is experiencing rapid urbanisation and has continued its process of epidemiological transition, leading to an increasing burden of chronic and non-communicable diseases. Community programmes that have successfully targeted acute disorders in the past should be adapted to address chronic disorders and provide the ongoing care needed to manage them. New approaches will be needed to provide community health workers with a different set of preventive and curative capacities and to delineate their role and integration in the health system.¹⁰⁸ Although innovations in service delivery have been successfully implemented in rural regions, strategies are needed to meet the needs of the country's rapidly growing urban population. Implementation of these strategies will be challenging because of the underlying structural complexity of the association between the Ministry of Health and Family Welfare and Ministry of Local Government who are more directly responsible for the urban regions.

Future partnerships should focus on areas in which innovation is presently absent, but urgently needed, such as neonatal health, undernutrition, skilled birth attendance, management of obstetrical complications, and essential emergency surgery (eg, caesarean sections). Experimentation should also be focused towards the designing of strategies for hard-to-reach regions such as the wetlands, highlands, and chars (low-lying temporary sand islands). Mobile phone technology to improve communication and new diagnostics can help community-level providers in these areas to improve the services they provide. The revitalisation and

operationalisation of the new health facility tier of community clinics (panel 3) represents another major emerging partnership, this time, directly between the government and the communities. Experimentation will be necessary to ensure the sustainability and effectiveness of community clinics in delivery of services.

We have described three innovative approaches to health-service delivery that have contributed to Bangladesh's impressive public health gains. These approaches have been successfully applied to a variety of high priority programmes and have evolved over time to meet the continued challenges facing health-service delivery. Throughout this period the government has overcome the consequences of limitations of public health services by actively investing in and supporting these approaches both directly and through partner NGOs. These approaches remain relevant to the present and emerging public health challenges facing Bangladesh.

Contributors

SEA, AC, and LR were responsible for the writing of the paper. AC took the lead on the literature review. DHP, HP, SEA, AC, FAO, KA, KSI, FA, and LR provided critical input into data collection, data interpretation, and analysis. All authors contributed to original drafts of the manuscript and provided critical revisions on subsequent drafts. All authors have seen and approved the final version. LR, as corresponding author, had access to all the data in the study and had final responsibility for the decision to submit for publication.

Conflicts of interest

We declare that we have no conflicts of interest. FA is a member of The *Lancet* Bangladesh Series Steering Committee and is Director of BRAC international programmes. This article had no direct funding source. We presented a draft of the manuscript at a meeting about the *Lancet* Bangladesh Series in Bangkok, Thailand, funded by the Rockefeller Foundation.

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