



Bangladesh: Innovation for Universal Health Coverage 1

The Bangladesh paradox: exceptional health achievement despite economic poverty

A Mushtaque R Chowdhury, Abbas Bhuiya, Mahbub Elahi Chowdhury, Sabrina Rasheed, Zakir Hussain, Lincoln C Chen

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This is the first in a Series of

six papers about innovation

for universal health coverage

in Bangladesh

BRAC, Dhaka, Bangladesh

(Prof A M R Chowdhury PhD);

Columbia University,

New York, NY, USA

(Prof A M R Chowdhury);

International Centre for

Diarrhoeal Disease Research,

Bangladesh, Dhaka,

Bangladesh (Prof A Bhuiya PhD,

M E Chowdhury PhD,

S Rasheed PhD); World Health

Organization, Southeast Asia

Regional Office, New Delhi,

India (Z Hussain PhD); and

China Medical Board,

Cambridge, MA, USA

(Prof L C Chen MD)

Correspondence to:

Prof A Mushtaque R Chowdhury,

BRAC, Dhaka 1212, Bangladesh

mushtaque.chowdhury@brac.net

Bangladesh, the eighth most populous country in the world with about 153 million people, has recently been applauded as an exceptional health performer. In the first paper in this Series, we present evidence to show that Bangladesh has achieved substantial health advances, but the country's success cannot be captured simplistically because health in Bangladesh has the paradox of steep and sustained reductions in birth rate and mortality alongside continued burdens of morbidity. Exceptional performance might be attributed to a pluralistic health system that has many stakeholders pursuing women-centred, gender-equity-oriented, highly focused health programmes in family planning, immunisation, oral rehydration therapy, maternal and child health, tuberculosis, vitamin A supplementation, and other activities, through the work of widely deployed community health workers reaching all households. Government and non-governmental organisations have pioneered many innovations that have been scaled up nationally. However, these remarkable achievements in equity and coverage are counterbalanced by the persistence of child and maternal malnutrition and the low use of maternity-related services. The Bangladesh paradox shows the net outcome of successful direct health action in both positive and negative social determinants of health—ie, positives such as women's empowerment, widespread education, and mitigation of the effect of natural disasters; and negatives such as low gross domestic product, pervasive poverty, and the persistence of income inequality. Bangladesh offers lessons such as how gender equity can improve health outcomes, how health innovations can be scaled up, and how direct health interventions can partly overcome socioeconomic constraints.

Introduction

Bangladesh has a population of about 153 million, and is the eighth most populous country in the world, and third most populous Muslim-majority country after Indonesia and Pakistan.¹ At the time of independence after the Bangladesh War of Liberation in 1971, the country was desperately poor, and densely populated, with an agrarian economy subject to frequent natural disasters. Henry Kissinger labelled Bangladesh as a country without hope.² However, four decades later, Bangladesh has had exceptional health achievements. In 2010, the UN recognised the country for its exemplary progress towards Millennium Development Goal (MDG) 4 in child mortality,^{3,4} and for being on-track to achieve the maternal mortality reduction goals of MDG5.⁵ More recently, Bangladesh was praised as an example of "good health at low cost".⁶ Neither extreme of previous hopeless desperation, nor recent unqualified applause, captures the subtlety or complexity of Bangladesh's health story. The country presents a puzzling paradox of substantial mortality reductions alongside uneven health burdens due to the mixed effects of direct health actions and many social determinants of health.

The 1971 war had an important role in starting national development processes, which were characterised by social mobilisation, institutional pluralism, and civil dynamism, creating space for many stakeholders, government, non-governmental organisations (NGOs), informal providers, international donors, and commercial enterprises. In health-service delivery, all these stakeholders combined to pursue a

Key messages

- Bangladesh is an exceptional health performer, but it presents the paradox of pronounced reductions in mortality accompanied by persistent malnutrition and low use of some basic health services
- Bangladesh's success might be attributed to a pluralistic health system with many stakeholders, including government and non-governmental organisations, who pursue women-focused, equity-oriented, nationally targeted programmes, such as those in family planning, immunisation, oral rehydration therapy, maternal and child health, tuberculosis, vitamin A supplementation, and others
- Especially noteworthy is Bangladesh's approach to equity, and its widespread deployment of (mostly female) community health workers to bring high-priority services to every household in the country
- The Bangladesh paradox shows successful direct health action in the context of positive and negative social determinants of health—positives such as women's empowerment, widespread education, and mitigation of the effect of natural disasters, and negatives such as low gross domestic product, pervasive poverty, and the persistence of income inequality
- Bangladesh offers many lessons, including how gender equity can improve health outcomes, how health innovations can be scaled up, and how direct health interventions can partly overcome socioeconomic constraints

pro-equity strategy, concentrating direct action on high-priority health issues such as family planning, immunisation, oral rehydration therapy, tuberculosis, vitamin A supplementation, and others. Noteworthy is that these health actions emphasised women's empowerment and gender equity to a degree that Bangladesh, despite its low gross domestic product (GDP), was able to enter the medium range of the UNDP Human Development Index category in 2003.^{7,8} In the health sector, pioneering innovations for new policies, products, and processes were developed that were rapidly adopted and widely disseminated.⁹ Health actions were scaled-up to the entire country through the massive and unprecedented deployment of diverse cadres of mostly female frontline health workers reaching every household.^{10,11}

However, impressive health progress has been imbalanced. Despite progress in human survival, other health indicators have lagged behind. Health service indicators show insufficient access to and use of maternity services.^{12,13} Noteworthy is the persistence of a high prevalence of child and maternal malnutrition, even as the early signs of a rise in obesity have begun to emerge.¹⁴ Bangladesh's pattern of health improvements is imbalanced because of the effects of crucial social determinants of health. Pro-health social determinants include gender equity, widespread education of girls, and mitigation of the effects of frequent natural disasters. Social determinants reducing health advances include low national GDP, high level of poverty, and persistent income inequality. In the first paper in this Series, we present the story of Bangladesh, starting with the history and culture, followed by evidence to substantiate arguments about Bangladesh's remarkable health performance.

Historical overview

Geography and history are important aspects to understand Bangladesh's path of development. Located in south Asia, the country is surrounded on three sides by India (with a narrow border with Burma in the southeast of the country), and with the Bay of Bengal in the south (figure 1). The main language is Bangla (or Bengali). Compared with other countries in the region, the landmass that constitutes Bangladesh is fairly new. It is part of a delta created by silt flowing from the Himalayas and through the Ganges and Brahmaputra (known in Bangladesh as Padma and Jamuna, respectively). The country is crisscrossed by hundreds of small and large rivers that flow eventually to the Bay of Bengal and determine the lives and livelihoods of its people.¹⁵

Bangladesh's rich alluvial lands, cultural heritage, and artisanship have attracted many conquerors, and the delta has mostly been ruled by outsiders. About 85% of Bangladesh's population is Muslim. Hindus form about 10% of the population, and the remaining are Buddhists, Christians, and those who are animistic. The arrival of

Muslims started in the 7th century through Arab traders and preachers, followed by Mughal rulers. In 1757, British rule was established. The British chose Kolkata (West Bengal) as the centre of their rule, which resulted in the economic and political decline of Dhaka (East Bengal, present-day Bangladesh). East Bengal, mostly populated by Muslims, became a hinterland for raw materials for industries in West Bengal. A good analysis of the history as it relates to Bangladesh now is provided by Lewis.¹⁶ In 1905, the Muslims supported the administrative division of Bengal into east and west with the hope of safeguarding their economic, cultural, and political interests. The division was rescinded 7 years later because of strong opposition from educated and powerful Hindus. In 1947, East Bengal joined a few Muslim-majority provinces in the western Indian sub-continent to form Pakistan. The newly formed East Pakistan became a province of Pakistan, separated by 1200 miles of Indian territory. In terms of population, East Pakistan had more people than had the entire western region of the new country.

After the formation of Pakistan, exploitation of Bengalis in East Pakistan by the non-Bengalis in West Pakistan continued. The sense of dissatisfaction culminated in public protests in 1952, when Urdu was declared the state language of Pakistan. Although the Pakistan Government accepted both Urdu and Bangla as state languages when under pressure, the language movement incited the need for self-rule for Bengali people. Independent Bangladesh was formed in 1971, under the leadership of Bangabandhu Sheikh Mujibur Rahman, after the bloody civil war that resulted in the displacement and death of millions of Bengali people. Throughout the War of Liberation, indomitable Bangladeshis embraced a new identity. They were liberal Muslims and their language was Bangla, a

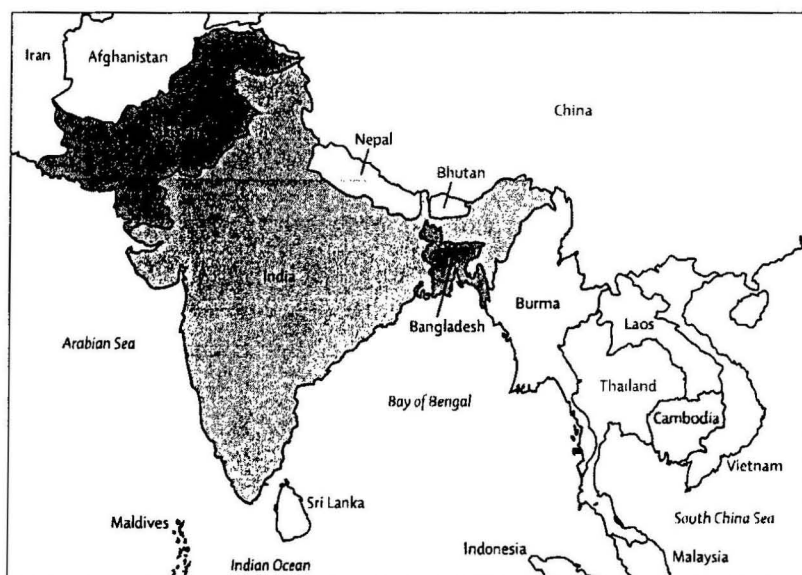


Figure 1: Bangladesh and neighbouring Asian countries

language originating from Sanskrit and Pali. This identity had much to do with the events that unfurled in Bangladesh after the war.

The systematic neglect of East Bengal and then East Pakistan caused poor organisation of both the civil and military bureaucracy of Bangladesh. A weak education system and systematic discrimination meant that Bangladeshis could not adequately compete for government jobs. Before 1947, most of the government positions were filled by bureaucrats from outside East Bengal, and this trend continued after the formation of Pakistan. Independence in 1971 left a vacuum in trained civil servants that was hard to fill quickly. The new government was faced with the challenge to develop an effective civil service, along with other daunting tasks. Quick changes in government and military takeovers were responsible for the sparse development of an

organised and efficient administrative cadre. NGOs, initiated by enterprising individuals soon after the war, provided an alternative force for the development of the country (panel 1).

The paradox

The Economist has recently applauded Bangladesh because of the country's spectacular gains in some of its social indicators.² Analysis of data from various sources (panel 2), reveals that, compared with the country's Asian neighbours, Bangladesh shows exceptional health achievement, but not without qualifications (table 1, figure 1). In addition to neighbouring countries in south Asia and southeast Asia, we have compared Bangladesh

Panel 1: Non-governmental organisations in Bangladesh

Bangladesh's vibrant civil society began in the early 1970s, and was driven by the dreams of a newly liberated nation, the desperate poverty of the post-war period, and the devastation of natural disasters. Some of the largest non-governmental organisations (NGOs) developed into the organisations they are today during this time—their initial focus shifted quickly from relief to poverty alleviation with the realisation that without provision of economic inputs, poor people were likely to remain poor and powerless.¹⁷ This shift towards service delivery and economic assistance created strong donor support for national activities of advocacy, microcredit, education, and health,¹⁸ especially in view of political volatility and the small capacity of the state.

Two decades later, NGOs in Bangladesh gained global prominence for their size, scope, and success, with burgeoning portfolios spanning microfinance, health and education services, social safety-net programmes, agricultural extension, environmental protection, water and sanitation provision, disaster management, legal and human rights education, and capacity building.¹⁹ At the beginning of the new millennium, Bangladesh had the world's largest and most dynamic NGOs.

This committed and capable leadership for the empowerment and emancipation of poor people is one crucial determinant for the ascendancy of NGOs in Bangladesh.²⁰ A second factor behind the growth and prominence of NGOs in health development has been the continuity of foreign aid, partly assured by the country's political stability, high unmet needs, and a good track record of results. A third factor relates to successive governments' accommodating or permissive stance towards NGOs.²¹ From a comparative, and certainly regional, perspective; public policy toward NGOs in Bangladesh has been unusually successful to balance the need for official oversight with the autonomy necessary for NGOs to operate and innovate.¹⁷ At an operational level, NGOs, together with the government, have pioneered one of the world's most successful and innovative tuberculosis treatment programmes,¹⁹ and developed a community healthcare programme that reduced maternal and child mortality.²² Beyond the delivery of services and pro-poor advocacy, NGOs have diversified the commercial sector, partly to lessen dependence on donors during a period of economic downturn and develop an independent source of internally generated revenue. Although many of these ventures have had clear positive developmental effects, some resistance to NGO entry into the for-profit sector has been encountered on the grounds of unfair competition.

The future of NGOs in Bangladesh will be defined by their constantly evolving relations with the government. To redefine and respect this equilibrium will be crucial to foster a further 50 years of global leadership by Bangladesh NGOs.

Panel 2: Data and methods

Along with a comprehensive literature search, data for this paper are from a rich array of primary sources, including four Bangladesh national Demographic and Health Surveys (DHS),^{12,23–25} 10-year national censuses,²⁶ regular social and economic household surveys by Bangladesh Bureau of Statistics,²⁷ and in-depth field studies carried out by organisations such as the International Centre for Diarrhoeal Disease Research, Bangladesh, and BRAC.^{5,14,28,29} Relevant UN estimates,^{13,30–34} and the database of the US Central Intelligence Agency,³⁵ are used for comparative analyses of Bangladesh with neighbouring countries, and official government statistics are cited as indicators of national health system inputs and outputs.^{36–39}

To compare health coverage between south Asian countries, we used the recently published DHS data sources from Bangladesh (2011), Nepal (2011), India (2006), and Pakistan (2007).^{12,40} We created a composite index⁴¹ by averaging the prevalence rate of modern contraceptives (MC), rate of use of antenatal care from a skilled provider (ANCs), rate of use of skilled attendance at delivery (SA), proportion of fully vaccinated children (FVC), proportion using oral rehydration therapy for childhood diarrhoea (ORT), and proportion of children with acute respiratory infection (ARI) treated by a qualified health-care provider. The composite index was calculated as follows:

$$(MC + [(ANCs + SA) / 2] + FVC + [(ORT + ARI) / 2]) / 4.$$

We used the concentration index to quantify the degree of socioeconomic inequality in health-care use. The concentration index is derived from a concentration curve, by plotting the cumulative percentage of population by increasing wealth quintiles on the x axis and the group's share of total use of services on the y axis. The concentration index ranges between -1 and +1. A concentration curve that matches the diagonal line of equality produces a concentration index of 0. The index is a positive value when the curve lies below the line of equality, indicating favourable concentrations of use of services by rich people. A negative value indicates a higher concentration of use of services by poor people.^{42,43}

with the Indian state of West Bengal, which was separated from East Bengal in 1947. West Bengal provides a useful comparison because it shares history, ecology, and Bengali culture with East Bengal. Comparison with Pakistan is also relevant because Bangladesh was part of the country until 1971. Bangladesh's national GDP puts it in the lowest income group of countries and regions, in the same range as neighbours such as Nepal, West Bengal, and Cambodia. However, Bangladesh's life expectancy is superior to that for the other countries, except for Nepal. Bangladesh's infant mortality, under-5 mortality, and maternal mortality rates are also superior to those for the other neighbouring countries and regions, except for West Bengal. Bangladesh is ahead of Pakistan in all education and health indicators. Thus, Bangladesh is a so-called positive deviant in terms of its superior health performance relative to other countries and regions, but it is not alone in outstanding achievement.

Progress in infant, child, and maternal mortality has been substantial and steady during the past four decades (figure 2). The steepest gains have been made in maternal mortality and mortality of children younger than 5 years, and slower gains have occurred in infant mortality. There was a temporary spike of mortality during the 1974–75 food shortage and famine, but this spike is not apparent in 10 year mortality rates.⁴⁴ The unprecedented reversal in excess mortality of girls compared with boys is startling.⁴⁵ This finding is a remarkable empirical demonstration that gender-based health and social interventions can reverse marked biases in the care and treatment of children. Maternal mortality was reduced from 574 deaths per 100 000 livebirths in 1991, to 194 deaths per 100 000 livebirths in 2010.⁵ As a surprise to many sceptics, Bangladesh also had pronounced reductions in birth rate (fertility) from about 7·0 children per woman in 1970, to 2·3 children per woman in 2010 (figure 3). Use of contraceptives in prevention of unwanted pregnancy increased from less

than 10% of all couples in 1970, to 61% in 2010 (modern contraceptive 52%; traditional method 9%).¹² This great reduction of fertility rate undoubtedly contributed to the speed and magnitude of improvements in mortality, particularly in women. Major shifts in cause of death have occurred because of these reductions in mortality and birthrate.⁴⁶ Similar to many countries that have had epidemiological and demographical transitions, Bangladesh has had a decline in infectious diseases and a rapid onslaught of non-communicable chronic diseases in an increasingly urban and ageing population (figure 4).

Bangladesh's exceptional health outcomes are partly due to both the structure of the public sector and the pluralistic health system, which is characterised by equitable and extensive outreach to all households.¹⁷ The country has a three-tier administrative arrangement for its formal health system. A major provider of services is the government, which has hospitals at district and subdistrict levels, and health centres and frontline workers at union and village levels, respectively. Bangladesh's public health system has two (not one) wings because the prioritisation of family planning and maternal–child health services in the 1970s led to the creation of separate wings with separate sectors of public workers. This two-part public system, with its distinctive history, is paralleled by two other major subsystems. Registered private for-profit hospitals and clinics are situated at tertiary and district levels. Even more noteworthy are Bangladesh's non-profit NGOs that provide clinical services, mostly aimed at maternal, newborn, and child health, and family planning, in cities and towns, and satellite clinics and front-line workers in communities. The number of community health workers who are deployed in Bangladesh (more than 160 000 in total, about 55 000 in public sectors, and more than 105 000 in NGO sectors) is a testament to how many services can be provided by paraprofessionals when there is a scarcity of credentialed health professionals.¹⁴⁷ In addition to the formal health-care system, Bangladesh

	Development indicators				Health outcomes			
	Population (millions)	Per head GDP (US\$)	Poverty (%)	Girls enrolled in primary education (%)*	Life expectancy at birth (years)	Infant mortality (per 1000 livebirths)	Under-5 mortality (per 1000 livebirths)	Maternal mortality (per 100 000 livebirths)
South Asia								
Bangladesh	152·9	673	32·0%	92·3%	68·3	42	51	194
Pakistan	173·6	1007	22·3%	69·8%	65·0	66	86	260
Nepal	30·0	524	30·9%	NA	68·0	46	54	380
India	1224·6	1476	27·6%	89·3%	64·8	48	65	230
West Bengal	91·3	612	NA	NA	64·9	33	40	145
Southeast Asia								
Cambodia	14·1	802	30·1%	95·7%	62·1	53	69	85
Laos	6·2	1208	27·6%	87·8%	66·7	37	46	580
Burma	48·0	NA	NA	32·0%	64·2	45	57	240

Data from references 1, 30, 31, and 40. GDP=gross domestic product. NA=not available. *Primary education denotes girls aged 6–10 years.

Table 1: Development indicators and health outcomes for Bangladesh and neighbouring countries and regions

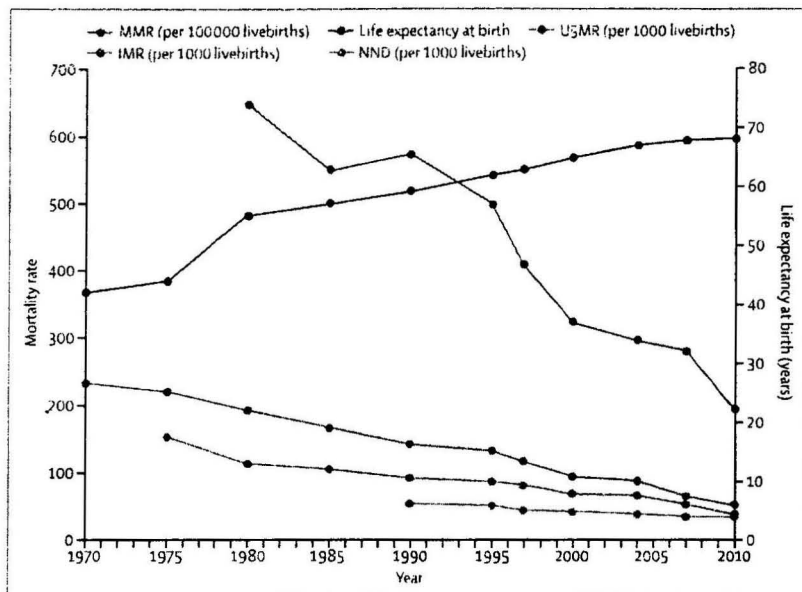


Figure 2: Life expectancy and various mortality rates in Bangladesh (1970–2010)

Data from references 30, 31, and 40. MMR=maternal mortality ratio. U5MR=under-5 mortality rate. IMR=infant mortality rate. NND=neonatal deaths.

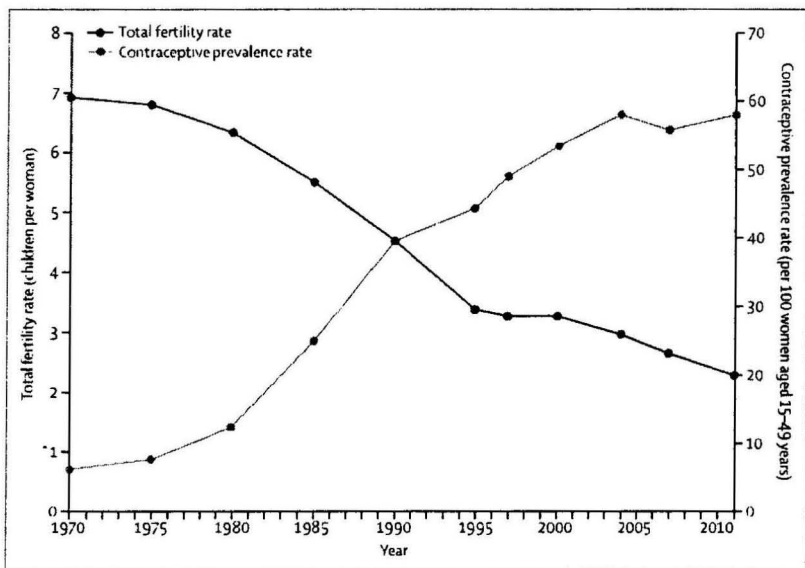


Figure 3: Total fertility and contraceptive prevalence rates in Bangladesh (1970–2010)
Data from references 30, 31, and 40.

has thousands of informal health workers, traditional healers, and private drug retailers throughout its rural countryside."

This pluralistic health system generates impressive health outputs (table 2). For example, outreach and coverage of vaccination and oral rehydration therapy programmes are exemplary compared with neighbouring Asian countries. However, outputs of antenatal and maternity services are less robust. Gains in health

outcomes have been achieved despite inadequate health system inputs, such as health workforce density, distribution and composition, health-sector financing, and the ratio of public versus private expenditures." Bangladesh has low ratios of credentialed professionals—only 0.5 doctors and 0.2 nurses per 1000 people, far less than the minimum standard of 2.28 per 1000 recommended by WHO.⁴⁰ Bangladesh spends only 3.7% of its GDP on health, out of which about a third comes from public resources. Not all the remaining two-thirds are private out-of-pocket payments, since non-profit NGOs also invest in health programmes. These NGOs are private, but are socially (not commercially) driven. Foreign donor contributions are channelled through governmental and NGO routes. The per capita health expenditure of US\$27 (or \$67 purchasing power parity)⁴¹ is nevertheless low, both in absolute terms and compared with neighbouring countries (table 2).

Not all health indicators in Bangladesh are positive. Rates of maternal antenatal care use, skilled birth attendance, and facility-based deliveries are lower than are those for neighbouring countries (table 2). Also of concern is the high prevalence of child malnutrition. Prevalence of stunting (low height-for-age) in children younger than 5 years was 66% in 1990, but had improved to 42% in 2010.⁴² Despite improved survival, nearly half of children in Bangladesh have chronic malnutrition. This aspect of Bangladesh's health story is shared with India, which also has a high prevalence of child and maternal malnutrition.⁴³ The rates of underweight in children from the poorest families decreased from 59% in 2004, to 50% in 2010 (figure 5A). A similar pattern is present when data for maternal education are analysed (figure 5B). Noteworthy is that even in the wealthiest quintile, 21% of children were underweight in 2010. Even in children born to mothers with secondary education, about 30% were malnourished. These data emphasise the complexity of malnutrition, which has many determinants that range from poverty and hunger, low rates of exclusive breastfeeding, inadequate care and complementary feeding, and recurrent infections.

The rising incidence paradox of nutritional deprivation in the midst of increasing economic abundance is shown by the rising incidence of overweight and obesity. Maternal body-mass index (BMI) higher than the cutoff of 23.0 kg/m² has increased from 6% in 1996, to 25% in 2010. Rural women are more likely to be undernourished than are those in urban environments (29% vs 17%), whereas urban women are more likely to be overweight (38% vs 18%).⁴⁴

Poverty and income inequality remain a persistent challenge in Bangladesh. The prevalence of the high poverty level (head count ratio <\$1.25 income per day, purchasing power parity-adjusted) has decreased from 57% in 1990, to 32% in 2010.⁴⁵ Therefore, despite improvements, 47 million people in Bangladesh live below the poverty line. Bangladesh's poverty has been

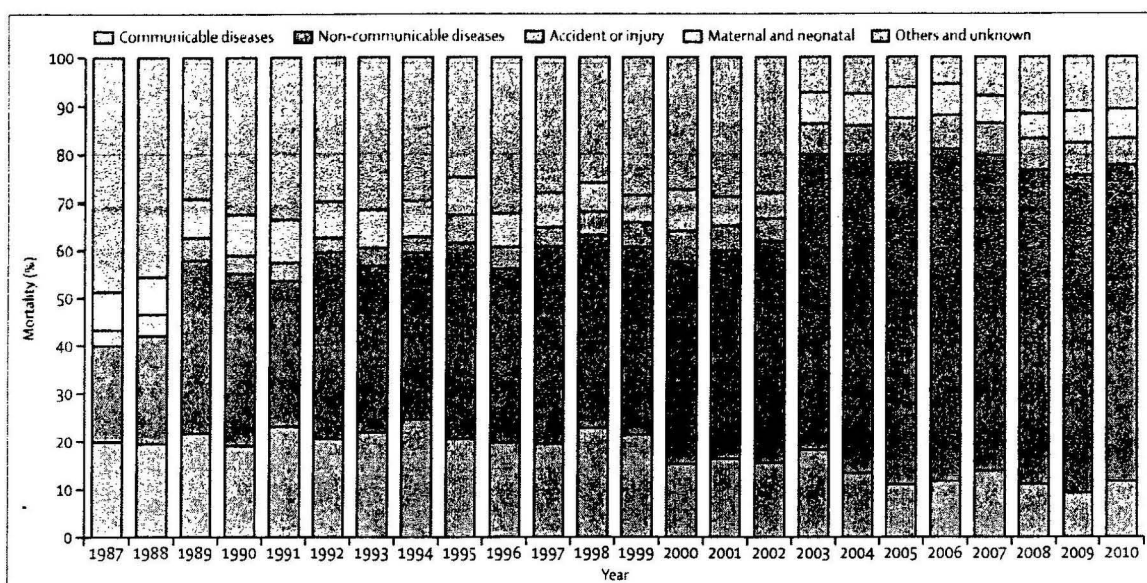


Figure 4: All-ages causes of deaths in Matlab, Bangladesh (1987-2010)
Data from references 28 and 46.

	Health systems					Health outputs			
	Health expenditure (% of GDP)	Public expenditure in health (% of total health expenditure)	Per head health expenditure (US\$)	Doctors (per 1000 population)	Nurses (per 1000 population)	EPI (%)	Diarrhoeal episodes that receive oral rehydration therapy (%)	Skilled attendance at delivery (%)	Facility delivery (%)
South Asia									
Bangladesh	3.7	36.6	27	0.3	0.3	82.0%	83.4%	31.7%	26.9%
Pakistan	2.5	27.0	30	0.8	0.5	47.3%	48.0%	42.1%	37.4%
Nepal	5.4	39.3	33	0.2	0.5	82.8%	40.7%	49.5%	40.6%
India	3.9	31.0	59	0.6	1.3	44.0%	61.2%	48.9%	40.4%
West Bengal	NA	NA	NA	NA	NA	64.0%	69.4%	60.2%	42.0%
Southeast Asia									
Cambodia	5.7	22.4	51	0.2	0.9	78.8%	58.4%	75.1%	61.8%
Laos	2.8	49.0	37	0.4	1.0	NA	NA	41.5%	37.5%
Burma	2.0	13.0	23	0.4	1.0	NA	NA	63.9%	NA

Data from references 30, 31, and 40. EPI—expanded programme of immunisation. NA—not available.

Table 2: Health-system indicators and health outputs in Bangladesh and neighbouring Asian countries and regions

accompanied by lacklustre progress in reducing income inequality (figure 6). Bangladesh's Gini coefficients have remained stagnant at around 0.45 (estimates based on income data) across national surveys from 1990 to 2010.

Despite many complexities, Bangladesh's health achievements have been distinctive. The concentration index—used as a composite index for equity in use of services for family planning, child vaccination, treatment of childhood illnesses, and maternal health services (panel 2)—has improved, dropping from 0.22 in 2000, to 0.10 in 2010. A concentration index of 0.10 indicates that people in all wealth quintiles have received health-care benefits in a reasonably equitable manner. Analysis of recent available

data reveals that, as compared with its neighbours, Bangladesh achieved relatively improved gains in equity in health services, particularly in family planning services and treatment for childhood illnesses (table 3).

We identified further evidence of exceptional health achievements when we assessed life expectancy of the Bangladesh population in relation to three socioeconomic variables—GDP, female education, and poverty prevalence (figure 7). In cross-national comparisons, Bangladesh has a positive deviance in health achievement. After consideration of constraints imposed by GDP and the high prevalence of poverty, direct health action in Bangladesh has generated a superior performance in terms of access to

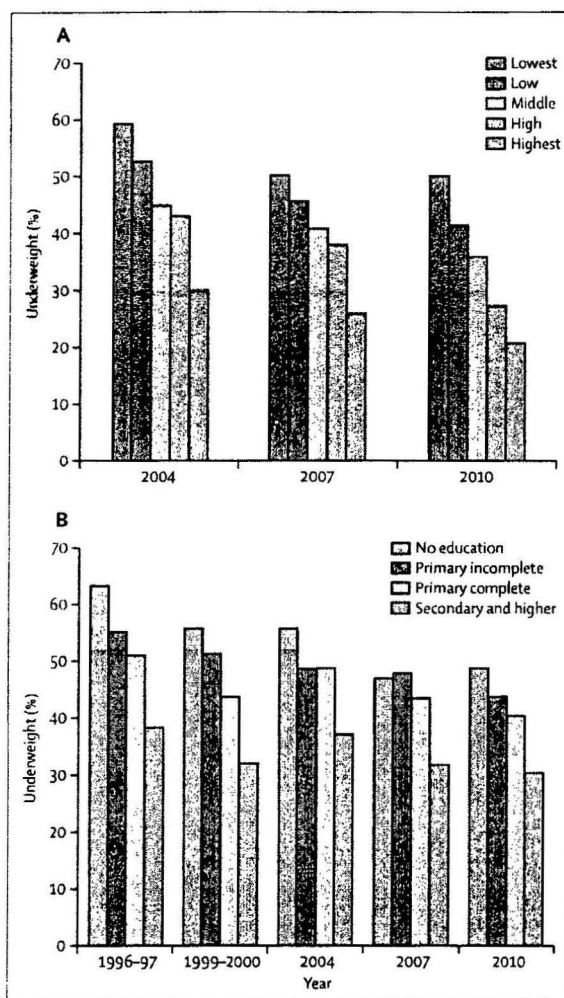


Figure 5: Underweight children by wealth quintiles (A), and underweight children by amount of maternal education (B)
Primary denotes education for girls aged 6–10 years, secondary denotes education for girls aged 11–15 years. Data from reference 40.

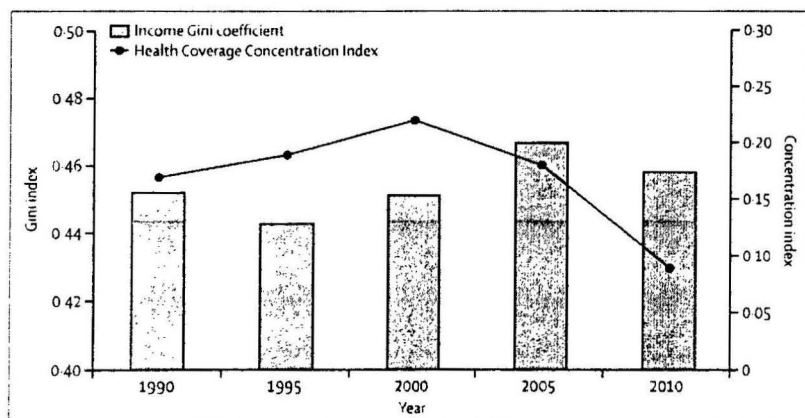


Figure 6: Income inequality (Gini index) and Health Service Concentration Index in Bangladesh (1990–2010)
Data from references 27 and 40.

the mentioned health services. Even after consideration of the advances in education for women, health action in Bangladesh has nevertheless achieved higher health outcomes than have comparable countries. A multiple linear regression for life expectancy of all countries in relation to log. of GDP, percentage of women in education, and percentage of population living below the poverty threshold showed a good fit (adjusted r^2 0.70). Each of the coefficients of the respective covariates was statistically significant. An increase in one log. unit of GDP is related to 3 years in life expectancy gains when the other two covariates are constant. Similarly, an increase of 1% in female education and a decrease of 1% in the proportion of population living below the poverty threshold is associated with 0.09 year and 0.15 year increases in life expectancy, respectively. This effect is greater than would have been expected in view of the negative or positive forces imposed by social determinants of health. The impressive findings for Bangladesh shown in figure 7 suggest that direct health actions in Bangladesh by many stakeholders that have delivered highest-priority health services have exerted a positive effect on health outcomes.

How did Bangladesh achieve its health gains?

The picture of health in Bangladesh

To classify Bangladesh as a country of good health at low cost might oversimplify the subtle and complex picture. In the context of Bangladesh, good health resulted in improved survival rates, but less impressive reductions in morbidity burden. Low cost is deceptive in that it does not distinguish between low national GDP, high prevalence of poverty, or actual investments in the health sector. Nor does the phrase give details of why and how Bangladesh has achieved its distinctive successes. Although Bangladesh is exemplary in its health performance, the phrase good health at low cost must be nuanced for a fuller understanding of lessons from Bangladesh. There is a subtle interplay of factors that might explain much of what is taking place in the country.

War of Liberation

Many contextual factors favoured Bangladesh's success—unique history, cultural heritage, liberal and secular attitudes of its people, inclusive development strategies, and pluralistic health stakeholders. The history and the War of Liberation undoubtedly shaped Bangladesh's development context. The war resulted in the defeat of both foreign occupiers and local religious extremists, and laid the ground for positive and progressive ideas to flourish. Breakthroughs such as large-scale family planning and health programmes were successfully established, despite opposition from conservative religious factions. The national commitment to equity was explicitly articulated in the 1972 constitution and post-independence development strategy, and this extended to the health sector. The adoption of many safety-net programmes shows the government's commitment to take care of the country's

poorest and marginalised populations. Improved roads and communications expanded access to information, social interactions, and health services across the country. A liberal policy environment helped the private sector to flourish, creating jobs for people and earning foreign exchange for the country. After the war, the impoverished government, by necessity, depended on international donors, and their shared policy created an enabling environment space that fostered the talents and innovations of civil society. Indeed, in many ways, Bangladesh's health achievement might be among the most visible and successful national examples of positive and sustained donor investments during the past four decades. The pattern of national development also favoured the improvement of some social determinants of health, including education, agriculture, and communication infrastructures. The emphasis on education has had huge effects on health, as have investment in agriculture, which tripled food production while the population doubled. Improvements to roads and communications expanded access to information, social interactions, and health services across the country. A liberal policy environment helped the private sector to flourish, creating jobs and earning foreign exchange for the country, particularly in the apparel industries and pharmaceutical sectors.¹⁹

Putting women in the forefront

Perhaps the most powerful strategy for health was the country's distinct acknowledgment and support of the contribution of women to national development (panel 3). Educational policies that favoured girls caused near-universal primary (children aged 6–10 years) education, and removed gender disparity in educational access.³⁵ In addition to progressive national policies for women, women were brought to the forefront of development work as leaders, implementers, and receivers of services.^{51,56} Recruitment of women as frontline workers for health and family planning improved the social acceptance of the mobility and work of young women.⁵⁷ Microfinance programmes targeting women noticeably expanded and empowered women in decision making for resource use and negotiation in health and family planning.⁵²

The role of NGOs

Bangladesh is home to some of world's largest and most successful NGOs. After the liberation war, the government created the organisational space, and donors provided financial support, for civic leaders to innovate various development programmes to cater to the needs of neglected groups in society. Organisations such as BRAC, Grameen, Gonoshasthaya Kendra, and Bangladesh Diabetic Samity (BADAS) are well-recognised names in global development (panel 1). BRAC has more than 120 000 full-time workers that serve more than 130 million people across ten countries, and has grown to become the world's largest NGO. Its contribution to the improvement of health of the poor people in rural Bangladesh is well documented.⁵⁸ Grameen's pioneering work in development, fine-tuning, and scaling up of microcredit for rural poor people was recognised with the Nobel Peace Prize in 2006. The work of Gonoshasthaya Kendra led the breakthroughs in the deployment of village-based paraprofessionals⁵⁹ and in progressive policy formulations, such as with Bangladesh's exemplary drug policy.⁵⁸ BADAS' network of hospitals and clinics provide low-cost health services for people with diabetes and other illnesses throughout the country.^{60,61} NGOs, such as the Family Planning Association of Bangladesh and Bangladesh Association for Voluntary Sterilisation, contributed hugely towards increased awareness and providing services for family planning. NGOs as a group have innovated to address issues of poverty, unemployment, health, education, and the environment, and in many cases, the government and NGOs have worked together to achieve a common goal.⁶²

Role of external assistance

Development assistance has had an important role in Bangladesh's development. Before independence, foreign assistance to the country was 0.7% of GDP in 1959–60, which rose to 4.2% in 1969–70.⁶⁴ The Bangladesh Liberation War focused the world's attention on Bangladesh, which increased aid for the new country. During 1970–90, development assistance was about 6% of GDP. After this time, it started to reduce and was 2%

	Family planning services		Maternal health care		Vaccination for children		Treatment for childhood illness		Overall	
	Coverage (%)	Concentration index	Coverage (%)	Concentration index	Coverage (%)	Concentration index	Coverage (%)	Concentration index	Coverage (%)	Concentration index
Bangladesh	52.1%	-0.01	50.9%	0.19	86.2%	0.04	59.0%	0.04	62.0%	0.10
Nepal	42.8%	0.06	50.8%	0.18	87.9%	0.02	35.6%	0.13	54.3%	0.17
India	48.2%	0.10	65.7%	0.17	46.2%	0.21	66.9%	0.06	56.8%	0.23
Pakistan	21.5%	0.18	54.0%	0.22	47.9%	0.16	65.3%	0.05	47.2%	0.19

Data from reference 40.

Table 3: Coverage and concentration index of family planning, maternal, and child health services in Bangladesh (2011), Nepal (2011), India (2006), and Pakistan (2007)

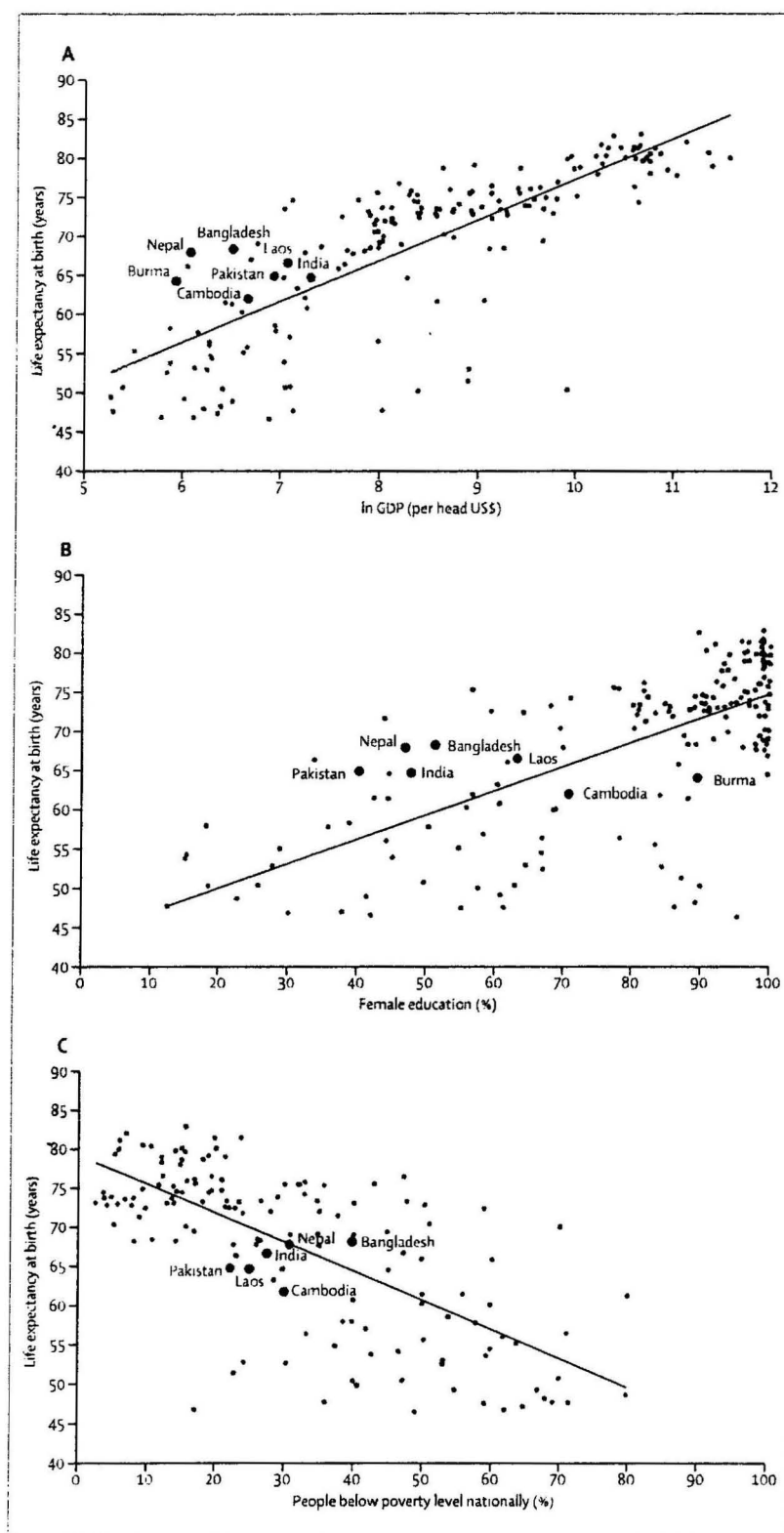


Figure 7: Life expectancy in relation to GDP (A), female education (B), and poverty (C) in countries. Data from references 31 and 35. GDP=gross domestic product.

of GDP in 2005. External resources financed 70% of investments in the 1970s, but this figure reduced to less than 10% in 2005. Opinion is mixed about whether external assistance to Bangladesh has had positive or negative effects.⁶¹ However, external aid was helpful to facilitate the work of the NGO sector, which attracted up to 18% of total aid commitment to the country in 2003.⁶⁴ Donors were keen to ensure that their money reached the people in need, and they regarded NGOs as an effective conduit rather than the country depending only on the government.

Scale-up of innovations

NGOs and the government collaborated to scale up innovative interventions.⁷ The government successfully increased outreach through the creation of new facilities up to the union and lower-levels, recruiting thousands of new workers. The immunisation programme reached almost all parts of the country, increasing the coverage from 2% in 1986, to 59% in 1993–94, to nearly 82% in 2007.^{21,65–67} The national implementation of a programme of oral rehydration therapy by BRAC enabled mothers to prepare homemade oral rehydration saline to combat their children's diarrhoea.^{68,69} In a unique move, the government joined NGOs in a nationwide implementation of the DOTS (directly observed treatment, short-course) programme for tuberculosis.⁷⁰

The culture of research and evidence

Much of the scaling up of innovations was strengthened by a widespread culture that produced and used evidence. Bangladesh respects and invests in research, particularly research in health. Such investment has led to enhanced programme design, and the effective monitoring and evaluation of programmes, leading to their improvement and successful implementation. Bangladesh has nurtured world-class health research institutions such as International Centre for Diarrhoeal Disease Research, Bangladesh, that developed oral rehydration therapy and pioneered much health policy and systems research within Bangladesh and around the world. Unusually for a non-profit organisation, BRAC has developed its own research unit and, more recently, a liberal arts university that has helped the government and NGOs to continuously monitor and guide programme design, policy, and implementation. The Bangladesh Institute of Development Studies pioneered much basic research that clarified the role of health during increasing poverty.⁷¹ The investment in research has helped to build research capacity within Bangladesh, and this Series in *The Lancet* is a testament to this achievement. Of 35 authors contributing to this Series of six papers, 25 are from Bangladesh.⁷²

Resilience against natural disasters

Bangladesh's health achievements were helped by its success in mitigation of the effects of, and in showing

resilience after repeated natural disasters. The paper by Cash and colleagues in this Series¹⁹ documents Bangladesh's innovations to alleviate the effects of natural disasters. For example, the cyclone of 1970 killed as many as 500 000 people compared with recent cyclones that, although of equal force and severity, killed only a few thousand people.¹⁵

Into the future

In the future, Bangladesh is likely to continue to face the complex pushes and pulls of many social determinants. Despite an annual economic growth of nearly 6%, because of improvements in agriculture, exports (especially of apparels), and human resources, poverty and its persistence will continue to hold back Bangladesh's health progress. Even after much policy priority and financial investments, more than 30% of people in Bangladesh are still classified as extremely poor and income inequality has widened with time. Poor implementation and weak bureaucratic leadership share much of the blame.⁷¹ Some of this lag in development is related to poor governance and overdependence by both government and NGOs on donors for policy formulation.⁷⁴ Corruption in Bangladesh is among the highest in the world.^{75,76} Local and national politics are fragmented and dominated by two political parties that continuously struggle to come to a consensus on national issues. Party interests and individual interests tend to dominate major national policy making.^{77,78}

In this political and economic context, some future health challenges are already visible on the horizon. Bangladesh is going through rapid urbanisation, generating cities of unprecedented density and congestion. About a third of city dwellers live in slums without basic infrastructure and social services.⁷⁹ In both urban and rural environments, there are dramatic changes to lifestyle, diet, exercise, and environmental pollution that increase the risks of several non-communicable diseases, including cardiovascular and metabolic diseases, cancers, and sociobehavioural disorders. These factors present both prevention and therapeutic challenges for a slowly adapting public health system. Consequently, the growth of private for-profit commercial medicine has accelerated, especially in urban areas. The Bangladesh health system has been shaped to address the first generation of poverty-linked infectious, nutritional, and maternity-related diseases, but given the epidemiological transition, the health system will have to be adjusted to grapple with chronic non-communicable diseases. For the fragile and evolving Bangladesh health system, the global attention on universal health coverage has not been translated into substantive action.⁸⁰

A major risk in the future is Bangladesh's vulnerability to climate change, particularly because of its ecology as a low-lying delta. Climate change might increase the frequency, severity, and effect of natural disasters, threatening both health and the resilience of society to

Panel 3: Women's empowerment and equity in Bangladesh

Bangladesh has achieved impressive improvements for the lives of women through access to services and legal protection of human rights. In education, the proportion of girls attending primary schools for children aged 6–10 years is greater than that of boys. Women's participation in economic activity has increased from 8% to 57% between 1983 and 2011, putting Bangladesh ahead of neighbours such as India (29%), Pakistan (22%), and Sri Lanka (35%).⁵¹ In the export-oriented apparel industry, women comprise more than 85% of the 3 million workers. In the informal sector, microcredit recipients now number more than 20 million women. Women's participation in economic activities has substantially empowered them within and beyond their own families.⁵² In health, increased access to comprehensive emergency obstetric care and family planning has contributed to a great fall in maternal mortality.⁵³ Employment of female community health workers has increased access to modern health services for women.⁹ Politically, women have dominated the Bangladesh Government for almost half of its 40 years of independence, with women serving as heads of government, leaders of the opposition, and speakers of the parliament. In the current government, three important ministries (foreign, agriculture, and defence) are headed by women. The constitution has guaranteed equal rights to women. Special legislative measures have been adopted to protect women from domestic and social violence, sexual harassment, and abuse. In a landmark judgment, the Bangladesh high court has declared extrajudicial punishments (of women) through the religious courts (fatwa) illegal.⁵⁴

However, everything is not as positive as it seems. Girls enrol in school in large numbers, but many drop out before completion. Women in formal employment are less skilled and more poorly paid than are their male counterparts. Although laws are in place to protect women's rights, enforcement is scarce. Women still face discrimination and violence. Some hurdles have been successfully overcome, but more daunting challenges remain.

prepare, respond, and recover. Moreover, even as Bangladesh grapples with health problems, not all health actions are benign. Contamination of drinking water with arsenic has occurred because of the use of ground water through tube wells for safe drinking water.^{81,82} In this unfortunate case, one development intervention generated yet another development challenge, one that will not be easily amenable to simple resolution.

Ultimately, the Bangladesh paradox is how to balance quantity and quality of life, and how to balance targeted health action with social determinants of health. Bangladesh's child survival accomplishments are laudable, but the country's social determinants are both pushing and pulling on the balance of health advancement.⁸³ How Bangladesh navigates this balancing act will be important, not only for its citizens, but also to generate important lessons for the world.

Contributors

AMRC and AB were the main coordinators of *The Lancet* Bangladesh Series, including this paper. LCC drafted the paper with MEC, SR, and AMRC. LCC and MEC produced and analysed the data. AB and ZH helped to edit and revise the review.

Conflicts of interest

We declare that we have no conflicts of interest.

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