

Hypertension and Diabetes in Bangladesh:

Findings from the Bangladesh
Demographic and Health Survey
(BDHS) 2017-18 and Policy Implications



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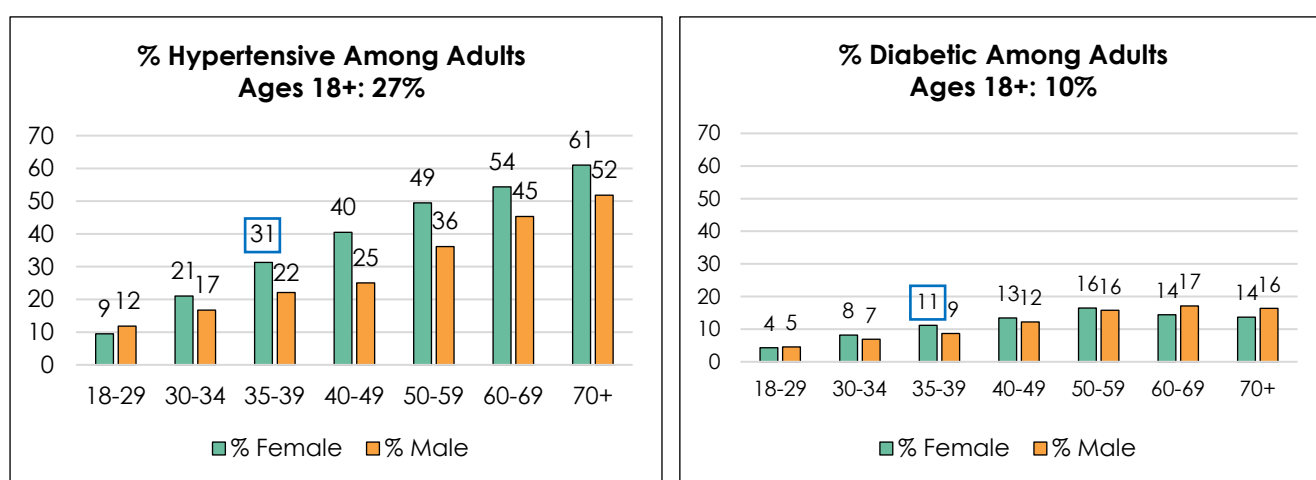
Major Non-Communicable Diseases in Bangladesh

In Bangladesh, non-communicable diseases (NCDs) now account for two out of three deaths annually, up from one in ten several decades ago. The reasons for this increase include, among others, that deaths due to communicable diseases have decreased and the decline in fertility and improving life expectancy have shifted the population age structure to older age groups where NCDs are more prominent.

Prevalence by Age and Sex

Two of the major NCDs, hypertension and diabetes, are prevalent in Bangladesh. The 2017 Bangladesh Demographic and Health Survey (BDHS) found that among adults ages 18 years or older, 27.3 percent had hypertension and 10.0 percent had diabetes. Prevalence of hypertension and diabetes both increased with age, and females were more likely to be hypertensive than males, which is unusual before menopause (Figures 1A and 1B).

Figures 1A and 1B. Hypertension and diabetes prevalence (%), females and males, BDHS 2017-18



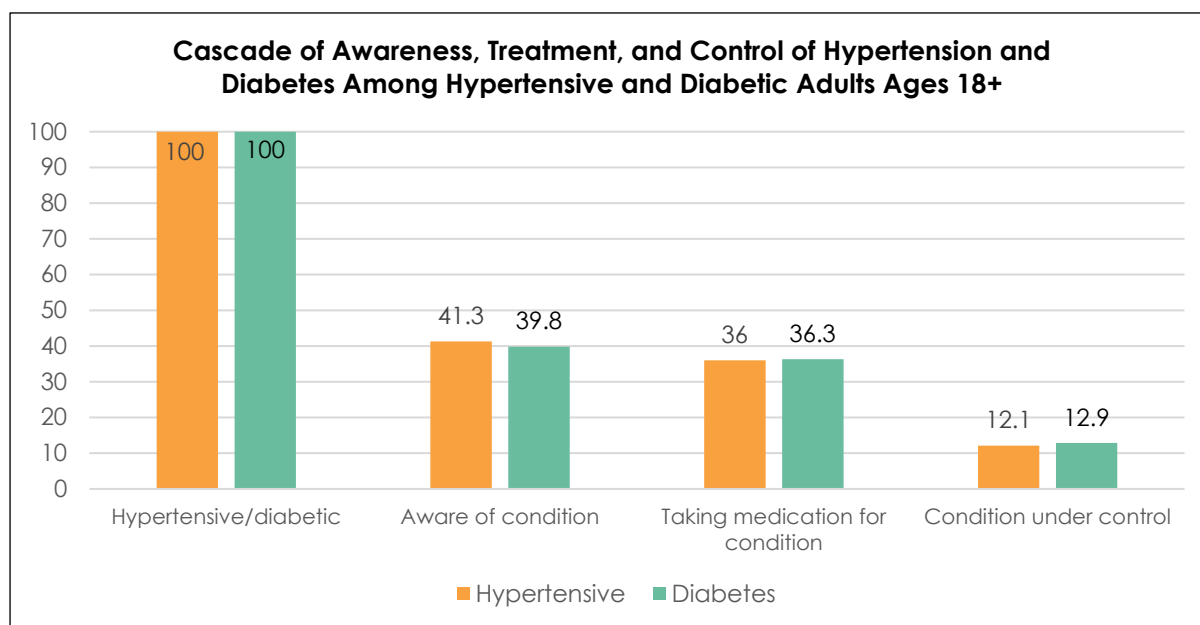
Projections of the Future Burden of Hypertension and Diabetes

If current age- and sex-specific prevalence rates remain constant, the growth and ageing of Bangladesh's population over the next three decades (based on UN World Population Prospects 2019 projections) will drive numbers of hypertension cases up—from 30 million in 2020, to a projected 38 million in 2030, 46 million in 2040, and 52 million by 2050. Similarly, for diabetes, numbers would rise from 11 million cases in 2020, to a projected 14 million in 2030, 16 million in 2040, and 18 million by 2050. These are conservative estimates, as comparisons of the 2011 and 2017-18 BDHS age- and sex-specific prevalence rates show that these rates are not constant but are increasing over time.

Management of Current Cases of Hypertension and Diabetes

Figure 2 shows that only two in five people with hypertension or diabetes were aware that they had the condition, and only one in eight (12-13%) of those with these conditions had them under control. On the positive side, most of those who were screened and were aware of their condition reported taking medication. This suggests that the system of receiving medical treatment for hypertension and diabetes, either through the public, private, or nongovernmental organization (NGO) sector, is working reasonably well once people get screened. Unfortunately, only one in three of those who have been prescribed medication have their condition under control. This implies a breakdown in the initial prescription of medicines, or in the follow-up where modifications of the drug dosage or type may be necessary, or where additional combination therapies are given to achieve control. There may be personal reasons for discontinuation of treatment by individual patients, including cost, side effects, access to the medication, or not understanding that lifelong treatment and lifestyle changes are needed. Much more needs to be understood regarding medication compliance if widespread control is to be achieved.

Figure 2. Cascade of hypertensive and diabetes cases by awareness, treatment, and control, Bangladesh 2020¹



Policy Recommendations

Expand Screening for Hypertension and Diabetes

- Reduce the age threshold for screening females from 40+ years to 35+ years, as one-third of women ages 35-39 years are positive for hypertension, and one in ten are positive for diabetes.
- The burden of screening and treating millions is beyond the capacity of the Ministry of Health and Family Welfare (MOHFW) Community Clinics (CCs) and Upazila Health Complexes (UHCs). Screening and treatment should also be available at Union Health and Family Welfare Centers (UHFWCs). The private sector, especially pharmacies and NGOs, could also provide these services, especially in urban areas where a large portion of the population seeks services from the private sector and/or NGOs.
- The use of the private sector and NGOs is more urgent in urban areas where the primary MOHFW infrastructure is not as developed as in rural areas. For example, in urban areas, there are no MOHFW CCs, UHFWCs, or UHCs, though there are some urban dispensaries.

Reduce the Age Threshold for Females for Referral by Health Assistants

The NCD Program of the MOHFW currently uses an age threshold of 40 years or older (as well as any pregnant women) for initial screening for hypertension or diabetes by CC staff. Those suspected to be positive for either, or both, conditions are then referred for confirmatory screening by a physician at the nearest UHC. The prevalence of hypertension/diabetes by age and sex show that targeting adults ages 40 years and older for referral misses a substantial number of females in a high-risk lower age group for hypertension/diabetes from active referral for screening. Among females ages 35-39 years, 31 percent have hypertension; with their risk of being hypertensive much higher than that of males ages 40-49 years (25%). Similarly, females ages 35-39 years are as likely to be diabetic as males ages 40-49 years (Figures 1A and 1B).

¹ Based on calculations from National Institute of Population Research and Training (NIPORT), and ICF. (2020). Bangladesh Demographic and Health Survey 2017-18; pgs. 219; 221. Dhaka, Bangladesh, and Rockville, Maryland, USA: NIPORT and ICF.

The most updated estimates of hypertension and diabetes for Bangladesh indicate a very substantial burden—48.7 million to be screened, and 28.6 million (sum of the total cases of hypertension and total cases of diabetes) expected positive cases of hypertension and diabetes needing treatment—as per the current NCD guidelines. If the age threshold for screening women for hypertension and diabetes was lowered to age 35, the screening load would increase by 6.5 million—becoming 55 million—and would detect an additional 2.9 million cases requiring medication (Table 1).

Table 1. Estimated number of people (by males/females, place of residence) needing screening for hypertension/diabetes and number of follow-up visits required for hypertension/diabetes cases, according to different age cut-off points for screening

Current 2020 numbers, females and males, different age cutoffs for screening (all numbers in millions)							
Females and males ages 40+				Females ages 35+ and males ages 40+			
Hypertension				Hypertension			
	Urban	Rural	Total		Urban	Rural	Total
Number of cases to be screened	17.7	31.0	48.7	Number of cases to be screened	20.0	35.2	55.2
Number of expected hypertensive cases	8.3	12.7	21.0	Number of expected hypertensive cases	9.1	14.0	23.1
Follow-up visits	100.0	152.5	252.5	Follow-up visits	109.1	167.4	276.5
Diabetes				Diabetes			
Number of cases to be screened	17.7	31.0	48.7	Number of cases to be screened	20.0	35.2	55.2
Number of expected diabetic cases	3.5	4.1	7.6	Number of expected diabetic cases	3.9	4.5	8.4
Follow-up visits	42.4	48.8	91.2	Follow-up visits	46.7	53.5	100.2

Note: Estimates from population numbers by age and sex for 2020 from UN World Population Prospects 2019, and age-sex specific hypertension and diabetes prevalence rates from BDHS 2017-18.

Update National NCD Program Guidelines

- To reduce the follow-up workload for health staff, medications for hypertension should be prescribed for longer periods—three or six months, after the initial prescription.
- Train non-physicians to conduct follow-up examinations. Refer to physicians only if the patient's condition is not under control.

The NCD program currently follows the World Health Organization's (WHO) guidelines which require hypertensive patients to return to a facility each month for follow-up. During follow-up, in addition to blood pressure retesting, another month's supply of medication is collected. This accounts for a huge number of follow-up visits annually. If medication could be provided for longer periods, possibly monthly initially, then every three or six months subsequently, once the condition is controlled, the burden on the health system would be reduced. The current requirement that follow-up assessments should be performed only by physicians should be reviewed so that lower-level health providers may perform selected assessments. If follow-up checks and resupplies could be done at the UHFWC or CC levels, this will also reduce the burden on the UHCs. Accomplishing this, however, would require effective collaboration at various levels between the Directorate of General Health Services (DGHS) and the Directorate General of Family Planning (DGFP).

An example of the delegation of follow-up to more peripheral non-physician staff is the very successful Kaiser Permanente Northern California hypertension program, which increased the proportion of hypertensive patients having their condition under control from 44 percent in 2001 to 80 percent in 2009, and to 90 percent by 2013. After initial physician diagnosis, the patients were followed up by medical assistants (MAs) after two to four weeks. The MAs informed the physician who then directed treatment

decisions and follow-up planning. This greatly reduced costs to the patients, and the burden on physicians.²

If the private and NGO sectors are to play a meaningful role in NCD management, they must be oriented on the guidelines for screening and treatment and have access to low-cost or free NCD medications to provide to those patients who cannot afford them. It may be prudent to utilize these additional resources through contractual arrangements in a coordinated manner. There will need to be strict monitoring mechanisms in place, and these mechanisms may be different for private sector and NGO sector facilities.

Expand Facilities for Screening and Treatment

- Allow for follow-up at peripheral facilities, like UHFWCs, or even CCs, to reduce caseloads on UHC staff. Also, allow for follow-up at private sector or NGO facilities.
- The MOHFW could provide subsidized or free medications to the private and NGO sectors, under contractual arrangements, to ensure that medications are accessible to the poor.

Table 2. Public, private, and NGO facilities which could provide screening and treatment for NCDs

	Rural	Urban
Government sector	421 UHCs	Tertiary hospitals
	4,300 UH&FWCs	35 Urban Dispensaries
	13,100 CCs	
Private sector	Private hospitals	Private hospitals
	5,500 Blue Star Pharmacies	2,500 Blue Star Pharmacies
		150 Grade "A" Pharmacies
NGO sector	Unknown	Urban PHC project clinics

Rural areas: The country's rural areas currently rely on about 421 UHCs (of these 60 are located at district headquarters, which are urban)³ to conduct confirmatory testing; implying, on average, 260 tests per UHC per working day. Each UHC located in a rural area will need to complete 1,400 follow-up visits for hypertension, and 450 daily follow-up visits for diabetic patients, each working day. This is a huge caseload. One suggestion is to expand capacities of the UHFWCs to assist in follow-up screenings and communicate with primary physicians at the UHC level. For screenings, union-level facilities that perform antenatal care tests should be capable of measuring blood pressure (BP) and blood glucose.⁴ Outside the public sector, there are 5,500 Social Marketing Company (SMC) "Blue Star" pharmacies in the rural areas, which have staff trained for screening and have the necessary equipment. An integrated approach to training primary-level service providers to conduct periodic clinical quality assessments, and develop provider guidelines, would enable both public, NGO, and private sector service providers to expand hypertension and diabetes screening at primary health care (PHC) facilities.

Urban areas: For the 18 million people requiring screening in urban areas, the approach must differ from that in rural areas. There are no CCs to serve as a first point of contact. However, there are major hospitals and numerous NGO clinics, as well as private consultation chambers with a qualified doctor. There are also numerous pharmacies licensed by the government, of which about 150 may qualify as grade "A", and

² Jaffe, M., Lee, G., Young, J., Sidney, S. Go, A. (2013). Improved blood pressure control associated with a large-scale hypertension program. *JAMA*, 310(7):699-704.

³ Retrieved from <http://facilityregistry.dghs.gov.bd/search.php>; http://app.dghs.gov.bd/inst_info/other/uhc.php

⁴ MOHFW. (2016). Bangladesh Essential Services Package (ESP); pgs. 29-30.

thus be suitable to provide screening. There are also 36 urban dispensaries managed by DGHS—some of which were recently renovated, with support from the Japanese International Cooperation Agency (JICA)—with a physician, nurse, and Sub-Assistant Community Medical Officer (SACMO) which could be trialed for urban NCD management. There are currently about 2,500 SMC “Blue Star” pharmacies, with another 1,000 coming onstream. Apart from involving NGO facilities as discussed above, partnering with the private sector for urban areas needs to be pursued. Experience gleaned from other countries suggests that pharmacists can identify and address patient barriers to compliance with medication for both hypertensive and diabetic patients. Evidence from rural USA,⁵ Ghana,⁶ and Nepal⁷ shows that, with active involvement of pharmacies, both BP levels and adherence to medication were improved among hypertensive patients.

Improve the Health System’s Capacity for Management of Hypertension and Diabetes

- More than half of the health facilities in Bangladesh provide some level of diabetes or hypertension services. However, only about one in five among these health facilities offer both diagnosis and management. The proportion of facilities offering these services needs to be increased.
- None of the health facilities providing services for diabetes or hypertension were “fully ready” (that is, they had all the essential components, including trained staff, guidelines, medicine, and equipment) to provide any of the NCD services. On average, public and private health facilities were around 50 percent ready (that is, they had 50 percent of the essential components) to treat hypertension and diabetes. Readiness needs to be increased.
- The MOHFW needs to focus on improving facility readiness by providing adequate training and supply of equipment, medicines, and guidelines in the government health facilities, particularly at the primary level.

Using data from the Bangladesh Health Facility Survey (BHFS) 2017, service availability and readiness for diabetes and hypertension were assessed using globally accepted standards.⁸ It was found that among all health facilities, 53 percent offered any diabetes services, and 70 percent offered any hypertension services. However, only 9 percent and 16 percent of all the facilities offered both diagnosis and management of diabetes and hypertension, respectively.

A facility is classified as “ready” to provide services for a specific NCD if all the following components are present: NCD guidelines; at least one trained provider in NCDs; and the necessary equipment, diagnostic supplies, and medicines. A standardized, composite readiness score⁹ for health facilities based on the BHFS 2017 data indicates that none of the existing health facilities have all components present to deliver diabetes or hypertension services. Figure 3 shows that peripheral level facilities, either public or NGO, have only around 40 percent of the components needed to screen for diabetes, and around 60 percent of the components to screen for hypertension.

⁵ Stanton-Robinson, et al. (2003). Evaluation of community pharmacist-provided telephone interventions to improve adherence to hypertension and diabetes medications. *J. Am Pharm Assoc*, 58(4S):S120-S124. doi:10.1016/j.japh.2018.04.030.

⁶ Marfo & Owusu-Daaku. (2017). Exploring the extended role of the community pharmacist in improving blood pressure control among hypertensive patients in a developing setting. *J. Pharmaceutical Policy and Practice*, 10(39). doi:10.1186/s40545-017-0127-5.

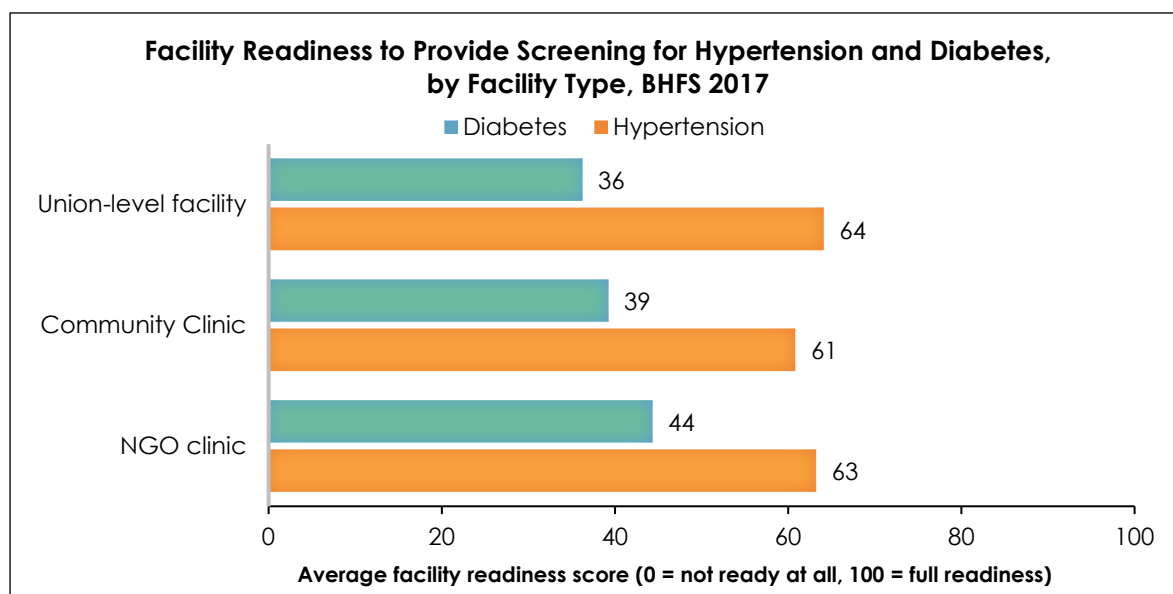
⁷ Sharma, et al. (2014). Impact of community pharmacy-based educational intervention on patients with hypertension in Western Nepal. *Aust. Med. J.*, 7(7):304-313. doi:10.4066/AMJ.2014.2133.

⁸ Health Statistics and Information Systems. Service Availability and Readiness Assessment (SARA): an annual monitoring system for service delivery: reference manual: version 2.2 [Internet]. Geneva, Switzerland: World Health Organization. Retrieved from:

http://apps.who.int/iris/bitstream/handle/10665/149025/WHO_HIS_HSI_2014.5_eng.pdf

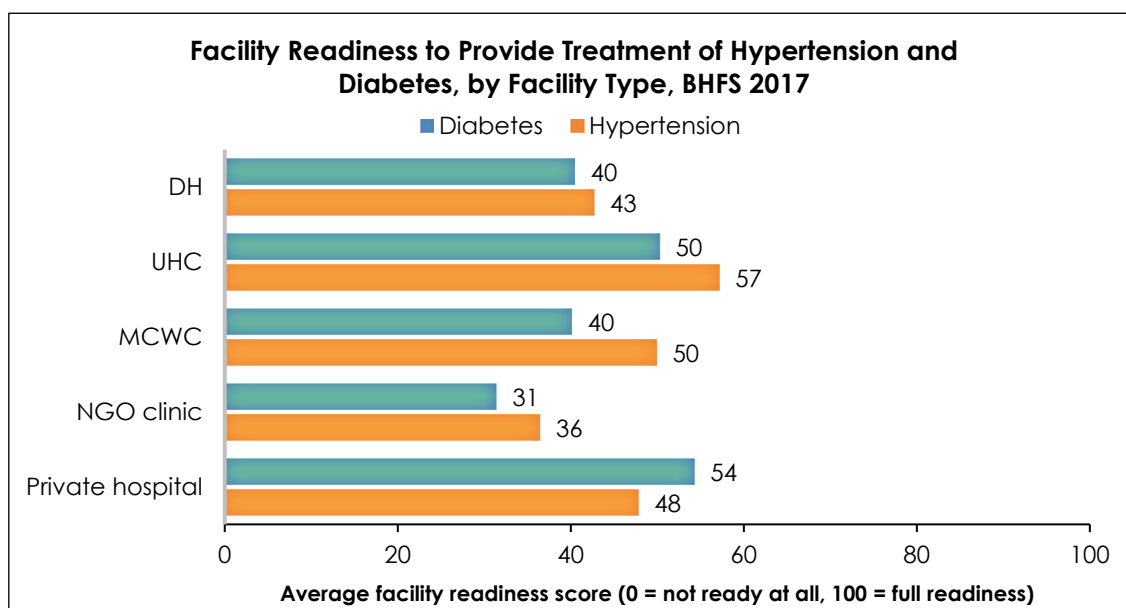
⁹ Wang, W., Mallick, L., Allen, C., Pullum T. (2019). Effective coverage of facility delivery in Bangladesh, Haiti, Malawi, Nepal, Senegal, and Tanzania. *PLoS One*, 14(6):e0217853.

Figure 3. Readiness of primary-level public and NGO facilities to provide screening for diabetes and hypertension, BHFS 2017



For readiness to provide treatment, Figure 4 shows that even higher-level public facilities, such as district hospitals and UHCs, were far from prepared. The BHFS 2017 found that none of the health facilities could be considered fully ready, mainly due to a shortage of trained staff and low availability of guidelines and medicines. On average, the higher-level facilities that provide diabetes and hypertension treatments have around 50 percent of the components required for intended services. The MOHFW needs to focus on improving facility readiness by providing adequate training and essential commodities to government health facilities. Much needs to be invested in local level public facilities to improve readiness if the demand for services is to be met. Selective involvement of NGOs and private sector facilities, and at the very least hospitals, can hopefully meet much of the growing demand. Based on the experience gained from delivering vaccination and reproductive health services in Bangladesh and other countries, the MOHFW can also explore ways to effectively engage the NGO and private sectors to address existing service gaps for the major NCDs.

Figure 4. Readiness of public, private, and NGO facilities to provide treatment for diabetes and hypertension, BHFS 2017



Improve Access to Information

- The MOHFW can make greater use of electronic and social media to provide information to raise awareness of the symptoms and consequences of hypertension and diabetes. It should provide information on why the public needs to be screened and what to do if they are detected as positive and require long-term treatment.

As seen in Figure 2, only two out of five screened during the BDHS survey were aware from prior health system screening that they had the condition. Community mobilization is needed to raise awareness about the need for screening for diabetes and hypertension and about suggested lifestyle modifications to better manage their condition(s), including the adoption of healthy habits (e.g., improved nutrition, regular exercise, and not smoking).

There are many avenues to convey relevant health education messages to individuals through electronic and print media. Mobile messaging is now known to be effective for supporting follow-up and adherence to medication and ensuring successful NCD management. A recent study in India showed that the cumulative incidence of diabetes over two years was significantly lower among those with pre-diabetes who received frequent text messages on mobile phones on healthy lifestyle principles (18%) than among the control group on standard care (27%).¹⁰ District Health Information Software, version 2 (DHIS2) is used for collecting data on health services and might be considered in the future for providing useful information for program managers to inform the public.

Prioritize Surveillance, Monitoring and Evaluation, and Research

- Bangladesh will benefit from longitudinal surveillance following various cohorts of urban and rural populations at risk of hypertension and diabetes. There is a major shortcoming in achieving successful management of these conditions, and much more needs to be understood about compliance with medication. Additional knowledge is needed regarding the effective drug regimens needed at different ages.
- Women are clearly at an elevated risk of hypertension than men due to being more restricted to home and being less involved in physical activity (manual labour or physical exercise). They are also more likely to be overweight or obese. Thus, different gender-sensitive interventions may be needed for access to screening, compliance with medication, and reducing risk factors.
- Interventions to change dietary practices and increase physical activity are needed but will require testing of different approaches, and rigorous evaluation over time.

As highlighted in the Multi-Sectoral Action Plan (MSAP), a national priority research agenda for NCDs, based on consultation with academia and relevant stakeholders, is necessary. The objective should be to support an NCD research alliance to improve the use of NCD surveillance and research data.

Globally, the best-known study of NCD risk factors and treatments is the Framingham Study started in Massachusetts in 1948 and continuing today.² A well-designed large-scale cohort study using a reasonably low-cost model should be undertaken in Bangladesh. The primary focus for Bangladesh would not be identifying risk factors, as these are largely known. Rather, the focus should be on the most effective ways to raise awareness, increase compliance with medication, and improve successful management. Attention is also needed on preventive actions to reduce NCD risk factors.

Multisectoral Approaches

The Multisectoral Action Plan recognizes that NCD prevention and control requires coordination across many ministries, civil society, academia and research institutes, NGOs, and development partners. It is a challenge to bring all 20 stated agencies and ministries on board, so a selection is highlighted in the section below. In addition to activities at government and ministry levels, there must be action at community and individual levels.

¹⁰ Nanditha, A., et al. (2020). A pragmatic and scalable strategy using mobile technology to promote sustained lifestyle changes to prevent type 2 diabetes in India and the UK: a randomized controlled trial. *Diabetologia*, 63:486-496.

Strengthen Advocacy, Leadership, and Partnerships

The advocacy component needs to focus on the completely inadequate level of funding (less than three percent of the annual health budget) in the national health program for widespread screening and management of NCDs. Leadership is needed to bring selected ministries, such as those for education and food, on board to induce permanent changes in dietary practices, food production, and consumption. The Ministry of Home Affairs and Ministry of Local Government and Rural Development (LGRD) must work to improve living conditions in urban areas to facilitate increased physical activity (e.g., creating more green space, reducing air pollution, and clearing footpaths of obstructive vendors). Partnerships between the MOHFW and the private and NGO sectors will be required to provide adequate screening and management.

Take Action to Promote Healthy Diet

Following two of the most successful NCD projects—the North Karelia Project in Finland¹¹ and Blue Zones Project¹² in the USA—a multifaceted approach of reducing consumption of red meat and salt; increasing vegetable, fruit, whole grain, and nut consumption; and using local residents recruited from women’s organizations in the villages to influence dietary change could be effective for Bangladesh, if adapted to the country context. However, regardless of the country, individual change is more likely to be sustained if there are enabling environments in place. Food systems, marketing patterns, purchasing power, and cultural factors all play important roles in determining individual and family lifestyles. An enabling environment requires supportive legislative, regulatory, and fiscal policies at the national level, as well as availability of supportive environments at schools, workplaces, and communities, and the availability of healthy choices that are obtainable within normal purchasing power.

Increasing access to healthier food choices, especially for low-income communities, requires ample supply of fresh foods—including regulations that support this—and facilitating access to high-quality diets through economical food pricing policies. Assessing trends in consumption patterns, and their implications for the food economy, is also important because it has implications for all components of the enabling environment as it pertains to food. All sectors in the food chain, from farm to table, will have to be considered while developing any “healthy diet policy.” Additionally, long-term, 360-degree communications strategies to ensure effective interpersonal communication on a healthy diet should be in place. Policymakers should be mindful that food consumption and diet are the result of generational habits and require effective communication to bring about the necessary changes.

¹¹ Vartiainen, E. (2018). The North Karelia Project: Cardiovascular disease prevention in Finland, *Global Cardiology Science and Practice*. Retrieved from <https://doi.org/10.21542/gcsp.2018.13>

¹² Retrieved from <https://www.weforum.org/agenda/2017/06/changing-the-way-america-eats-moves-and-connects-one-town-at-a-time/>

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