

Non Communicable Diseases in Bangladesh



BANGLADESH
HEALTH WATCH

Non-Communicable Diseases in Bangladesh

Current Scenario and Future Directions

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Foreword

This report on the Non-communicable Diseases (NCDs) is the sixth report presented by the Bangladesh Health Watch (BHW) on the state of health in Bangladesh. BHW, a civil society advocacy initiative since 2006 has been producing analytical reports on different issues that deserve priority attention of the government as well as non-government stakeholders who are committed to improve the health condition and health system of Bangladesh. So far five reports have been published. The first report focused on health equity (BHW, 2006); the second report on health workforce (BHW, 2007); the third report on governance of the health sector (BHW, 2009); the fourth report on universal health coverage (BHW, 2011); and the fifth report on urban health (BHW, 2014). All the BHW reports have attempted to present up-to-date data on the topic under discussion, analyze their policy and program implications and recommend long and short term actions. The reports were presented in public dialogues attended by policy makers, program implementers, civil society advocacy groups, and development partners as well as media representatives. All BHW reports drew widespread media coverage, and generated discussion and debate about various policy and program options that need to be considered by all stakeholders.

This sixth BHW report which is titled *Non-communicable Diseases in Bangladesh: Current Scenarios and Future Directions* follows in the tradition of the last five reports. It presents up-to-date data on the emerging problem of NCDs for health and health system of Bangladesh in the era of Sustainable Development Goals (SDGs). In the last four decades, Bangladesh

was able to make significant health gains and achieve health related Millennium Development Goals (MDGs). This was in part due to the priority given by the government as well as non-government organizations to tackle communicable diseases which accounted for majority of deaths in the country in the first two decades after independence. Health policy and programs were targeted to improve the health of children and women of reproductive age. However, at present NCDs account for 59% of total deaths in Bangladesh. Similar to many other low and middle income countries, Bangladesh has undergone an epidemiological transition from communicable to non-communicable diseases. But the health system of the country is not yet prepared to address the emerging epidemic of NCDs.

This report discusses the epidemiology of different NCDs and identifies various risk factors involved. It focuses on four major NCDs e.g. cardiovascular diseases, diabetes, cancer and chronic respiratory diseases. The report reviews the existing national policies and programs on NCDs and investigates the challenges involved in their implementation. It highlights the current health system's limitations for the management of the NCDs.

The report identifies three key challenges for the health system. The first is to mainstream NCD service provision at the primary healthcare (PHC) level. Here emphasis should be placed on prevention based on modifiable risk factors through life style changes. The second challenge is to establish a regulatory framework and coordination at the national level for control of tobacco and drug consumption and environmental pollution.

The third challenge is the establishment of a comprehensive and integrated NCD surveillance system for informed decision making and design of innovative interventions.

The report makes five major recommendations. The first is to build awareness on the extent and importance of the NCDs at the level of policy makers, practitioners and the community. The second is to develop an integrated multi-sectoral approach to prevent and manage NCDs with the Ministry of Health and Family Welfare (MoHFW) playing a stewardship role. The third is to strengthen the health system at all levels to address NCDs, especially developing the human and physical capacity at the PHC level for preventive services, screening for early diagnosis and treatment. The fourth is to establish a surveillance system and registry of the four major NCDs at the national level. The final recommendation is to generate evidence

for delivering preventive and curative NCD services, keeping equity and universal coverage in focus.

I believe this report will not only raise awareness about the urgency of addressing the emerging threat of NCDs, but more importantly catalyze specific actions by the government, non-government and private sector to improve and strengthen national capacity to prevent and manage NCDs.

Rounaq Jahan

Convener

Advisory Board Bangladesh Health Watch

April 26, 2017

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Finally, we acknowledge the contribution of our donor, The Rockefeller Foundation.

Acronyms

BADAS	Bangladesh Diabetic Samiti
BCCP	Bangladesh Center for Communication Program
BCPS	Bangladesh College of Physicians and Surgeons
BIRDEM	Bangladesh Institute of Research & Rehabilitation in Diabetes, Endocrine and Metabolic Disorder
BSMMU	Bangabandhu Sheikh Mujib Medical University
CANSUP	Cancer Support Society
CCD	Certificate Course in Diabetology
CCU	Coronary Care Unit
CDiC	Changing Diabetes in Child Program
CHW	Community Health Worker
COBRA-BPS	Control of Blood Pressure and Risk Attenuation-rural Bangladesh Pakistan Sri Lanka
COIA	Commission on Information and Accountability
COPD	Chronic Obstructive Pulmonary Diseases
CSO	Civil Society Organisation
CVD	Cardio Vascular Diseases
DGHS	Directorate General of Health Services
DGFP	Directorate General of Family Planning
DHIS2	District Health Information System 2
FCTC	Framework Convention on Tobacco Control
FRP	Financial Risk Protection
GATS	Global Adult Tobacco Survey
GK	Gonoshasthaya Kendra
GSHS	Global School-based Students Health Survey
HCDP	Healthcare Development Project
HFS	Health Facility Survey
HIC	High Income Country
HIES	Household Income and Expenditure Survey
HMIS	Health Management Information System
HMSS	Health and Morbidity Status Survey
HNPSIP	Health, Nutrition and Population Strategic Investment Plan
HPNSDP	Health, Population and Nutrition Sector Development Programme
HTN	Hypertension



ICHRI	Ibrahim Cardiac Hospital and Research Institute
ICU	Intensive Care Unit
IDF	International Diabetes Federation
IEC	Information, Education and Communication
IEDCR	Institute of Epidemiology, Diseases Control and Research
LFAC	Life for a Child
LMIC	Lower and Middle Income Country
LD	Line Director
MCWC	Maternal and Child Welfare Centre
MIS	Management Information System
MLP	Mid Level Providers
MNCC	Multi-sectoral NCD coordination committee
MNCH	Maternal Neonatal and Child Health
MoHFW	Ministry of Health and Family Welfare
NCCRFHD	National Center for Control of Rheumatic Fever Heart Diseases
NCDC	Non-communicable Disease Control
NHF	National Heart Foundation
NICRH	National Institute of Cancer Research and Hospital
NICVD	National Institute of Cardiovascular Diseases
NIDCH	National Institute of Diseases of the Chest and Hospital
NIMH	National Institute of Mental Health
NINS	National Institute of Neurosciences and Hospital
NIKDU	National Institute of Kidney Diseases and Urology
NITOR	National Institute of Traumatology and Orthopedic Rehabilitation
NTCC	National Tobacco Control Cell
OOP	Out of Pocket Expenditure
PEN	Package for Essential NCD
PHC	Primary Health Care
PPP	Public Private Partnership
PTCA	Percutaneous Transluminal Coronary Angioplasty
RHD	Rheumatic Heart Disease
RTA	Road Traffic Accident
SDG	Sustainable Development Goal
SHR	Social Health Record
THE	Total Health Expenditure
SES	Socioeconomic Status
STEPS	STEPwise Approach to Surveillance
UHC	Universal Health Coverage
UHC	Upazila Health Complex
UHFWC	Upazila Health and Family Welfare Centre
WBB	Work for Better Bangladesh
WDF	World Diabetes Federation



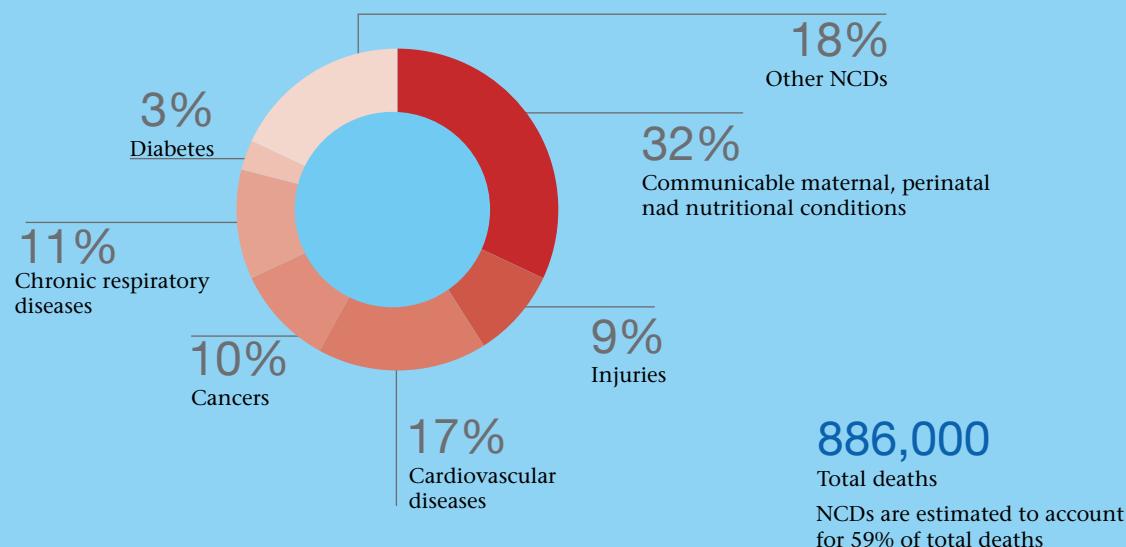
Executive Summary

The low and middle-income countries like Bangladesh are fast undergoing “epidemiological transition”, thanks to the spectacular success of modern medical science, economic development, improved water and sanitation, and substantial control of the communicable diseases. The longevity of the Bangladeshi population has increased (from around 45 years in early ‘70s to 65+ years in the second decade of twenty-first century), simultaneous with its entry into the third stage of ‘demographic transition’ (low birth and death rates) and near stabilization of its population. So far so good! The flip side of the coin is that these countries are becoming “old before they are rich” (WHO, 2016), and burdened with the rapid rise of non-communicable diseases (NCDs). This is posing a major challenge to the existing health systems (primarily geared to address communicable diseases of women and children) as the governments in LMICs are yet to pick up the momentum for the ever expanding needs for policies and plans, services, and infrastructures for preventing NCDs (Islam *et al.*, 2014).

NCDs are chronic diseases that develop progressively, impacts on functional health with the passing of time, and need health services sustained for a

prolonged period including ‘end-of-life’ pain management and other services. The major NCDs include cardiovascular diseases, diabetes, cancer and chronic obstructive pulmonary diseases (e.g., chronic bronchitis and bronchial asthma). Of lesser prevalence are the accidents and injuries, mental illnesses, and environmental (air, water and soil) pollution. Most of these NCDs have common lifestyle-related risk factors such as tobacco and alcohol consumption, inappropriate diet (less of vegetables and fruits and more of salt, sugar and fat), and low physical activity. The adverse personal, socio-familial, and economic consequences of non-communicable diseases (NCDs) are felt by all societies and economies, but are particularly alarming for the vulnerable and marginalized populations in resource-poor settings such as in Bangladesh. Currently, NCDs account for 59% of total deaths in Bangladesh (17% cardiovascular and 11% chronic respiratory diseases, 10% cancers, 9% injuries, 3% diabetes and 10% other NCDs) (WHO, 2014). The challenge it has thrown to the largely “weak, inadequately resourced and fragmented” health systems (Ahmed *et al.*, 2013) is quite substantial.

Bangladesh Health Watch, a civil society initiative since 2006, is producing



Proportional mortality (% of total deaths, all ages, both sexes) in Bangladesh

Source: WHO-NCD Country Profiles, 2014c

analytical reports on issues related to improvement of the health system from a critical perspective, and does the relevant advocacy activities. So far, five reports on equity (BHW, 2006), health workforce (BHW, 2007), governance (BHW, 2009), universal health coverage (BHW, 2011), and urban health (BHW, 2014) have been published. In 2016, this emerging problem of NCDs for health and health system of Bangladesh in the era of the SDGs is taken up for analysis and discussion. We limited our inquiry to the four major NCDs responsible for major chronic disease burdens e.g., cardiovascular diseases, diabetes, cancer, and chronic respiratory diseases. A descriptive analysis of the current scenario is done, based upon secondary data from published and unpublished materials, and attempts are made to sort out key action points for future health systems response.

This report has six chapters. After a brief introduction to the contents (Chapter 1), the second chapter deals with the epidemiology of different NCDs prevailing in the country including prevalence of risk factors involved. The third chapter reviews the existing national policies on NCDs, and briefly deals with the challenges involved in its implementation. An inventory of various programmes and interventions currently in operation for NCDs is done next (Chapter 4), which is followed by a discussion of current health system's preparedness and limitations for addressing the management of the NCDs (Chapter 5). The final chapter (Chapter 6) makes a synopsis of the findings and draws out the key actions for addressing effectively and efficiently the challenge of NCDs. Each of the chapters is led by an expert in its own field, assisted by a group of peer researchers.

The major NCDs and the life-style risk factors

Low and middle-income countries (LMICs) like Bangladesh are currently undergoing an epidemiological transition like their predecessors in the developed world. This phenomenon is characterised by a transition from predominantly communicable disease to a combination of communicable and non-communicable diseases---the so-called 'double burden of disease' (Boutayeb 2006). NCDs now account for 59% of the total disease burden in Bangladesh (WHO, 2014). Inappropriate diet (fast foods and beverages with high salt and sugar, less of fruits and vegetable), low physical activity (arising from sedentary life-style and faulty urban planning), and consumption of tobacco, alcohol (and recreational drugs) are some of the life-style related risk factors which are responsible for this changed scenario. Earlier study found a substantial proportion of the rural population (>70%) having three or more risk factors for chronic NCDs (Ahmed *et al.*, 2009). The recent trends in NCD-related risk factors in Bangladesh clearly indicate future acceleration of NCD prevalence and deaths with time as one- third of the population in Bangladesh would be over 60 years by 2050. This poses a challenge to the current health systems which is primarily geared to address the communicable diseases, especially of the mother and children! This review also identified key issues positioning NCDs within the Universal Health Coverage (UHC) and Sustainable Development Goals (SDGs) in the country context.

NCD policies and strategies: challenges of implementation

Currently, there are quite a number of national policies and strategies targeted towards specific NCDs, e.g., National Guidelines for Management of Hypertension in Bangladesh, Guidelines for care of Type 2 Diabetes mellitus in Bangladesh, National Strategic Plan of Action for Tobacco control 2007 – '10, National Cancer Control Strategy and Plan of Action 2009 – '15 etc. Besides, few policies and strategies such as 'Multi-sectoral Action Plan for NCD Control and Prevention (2016 – '21)' and 'Strategic Plan for Surveillance and Prevention of NCDs in Bangladesh (2011 – '15)' discuss about a comprehensive approach to the problem. However, the problems with these policies are that these are hardly comprehensive in nature and miss the much needed inter-sectoral and inter-ministerial coordination and directions to tackle the problem on a national scale. As such, the country still lacks a comprehensive and integrated NCD prevention and control strategy and plan of action across the public and non-state sectors in the urban and rural areas, covering the entire population.

On-going programmes for managing major NCDs

Preventive and promotive care, especially in the primary and secondary levels, is yet to get appropriate focus and attention that is needed from a long-term perspective to reduce NCD burden in the country. A review of current on-going NCD-related programmes show that the government's role is limited mainly to provide NCD-related

health education to people and capacity development of the existing health workforce at these levels. Specialized services are typically concentrated in the urban areas, mainly in the tertiary facilities. While the NGOs, private providers (for- and not-for-profit) and practitioners of traditional medicine play a large role in NCD-related service delivery, there is lack of efforts to integrate them systematically into a comprehensive framework of programmes. There is also lack of proper monitoring and surveillance of current activities due to constraints in physical and human resources.

The major on-going programmes addressing the NCDs are: Non Communicable Disease Control and Public Health Intervention Program, NCDC (deals with building awareness on NCD and provide NCD care, establishing dedicated NCD corners in the government hospitals, and equipping facilities with necessary instruments); Upazila NCD project (deals with developing capacity of the providers for NCD diagnosis and management); Health Care Development Project, HCDP (a Public Private Partnership project to test a model of integrated care in urban and rural areas with a focus on major NCDs); Tertiary level hospitals for CVDs, Cancer, lung and kidney diseases, mental illnesses etc. to provide modern NCD care in diagnosis, treatment and management with relevant sub-specialties. In the private for and not-for-profit/NGO sector, institutions such as BADAS/BIRDEM, ASHIC, WBB Trust, BRAC, icddr, b etc. are involved in providing both preventive and clinical services on specific diseases, especially targeting the disadvantaged population in some remote/hard-to-reach areas.

How far the health systems is prepared to address NCDs

At the end of the day, the question is: how far the health system is prepared to address the emerging challenges of managing NCDs? Currently, the existing health services at the PHC level is deficient in i) appropriately trained health workforce, necessary instruments (functional) for screening of NCDs, ii) emphasising prevention rather than cure while disseminating NCD information, and iii) supply of essential NCD medicines. There are also gaps at secondary and tertiary levels with respect to number of available experts, diagnostics, and treatment and follow-up services over time. Raising priority for NCD issues in other relevant sectors and ministries such as –education, local government, agriculture, food and nutrition etc. needs further attention. Strong national stewardship of the MoHFW is needed to coordinate a meaningful, multi-sectoral response for delivering comprehensive NCD services. Public private partnership (PPP) may be leveraged in initiating joint actions on many aspects of franchising the capacity building efforts for NCD prevention and management as a short-term measure.

Challenges and recommendations

Given the current scenario regarding the policies, strategies and programmes on NCDs, the following challenges are identified for a comprehensive approach to address NCDs in future:

1. *Mainstreaming NCD service provision at the PHC level: emphasising prevention based on modifiable risk factors through lifestyle changes*

Given the modifiable nature of risk factors associated with NCDs (i.e. high salt and sugar intake, less consumption of vegetable and fruits, tobacco and alcohol consumption, sedentary lifestyle etc.) it's important that primary level health facilities be made the focus of all NCD-related activities and thus appropriately equipped with trained health workforce, necessary equipments for screening, essential medicines for treating common NCDs, and a functional referral chain.

2. Absence of regulatory framework and lack of coordination at the national level

Regulatory mechanisms for control of tobacco and alcohol consumption, and harmful effects from environment (air, water, soil, and chemical pollution) and urban planning (unhealthy built environment) including its enforcement, is essential for prevention of NCD burden at the population and community levels.

3. Lack of robust database at national level for NCD surveillance and monitoring, incorporating common data from rural and urban areas as well as public, for-profit private and other non-state sectors

There is lack of a comprehensive, all inclusive and integrated NCD risk factors and disease burden database is necessary for informed decision making, designing innovative interventions, and monitoring and evaluation of on-going programmes, all in a cost-effective way.

To address these challenges, **five recommendations/action points** are made for immediate action:

- ▶ **Build awareness** on the extent and importance of the NCDs at present

and in near future and its linkage to poverty alleviation, economic development and achieving UHC at the policy, practitioners, and the community level.

- ▶ **Develop an integrated, multi-sectoral approach** to prevent and manage NCDs, with government, especially the MoHFW, in the stewardship role.
- ▶ **Strengthen the current health systems at all levels to address NCDs** with a focus on developing human and physical capacity at the PHC level for preventive services to affect modifiable NCD risk factors, and screening for early diagnosis and treatment including follow-up services for identified cases.
- ▶ **Establish a comprehensive surveillance system and registry** for the four major NCDs at the national level including monitoring and evaluation of NCD programmes, both on-going and the future ones.
- ▶ **Generate evidence** for delivering preventive and curative NCD services effectively and efficiently, keeping equity and universal coverage in focus.

In conclusion, a 'concerted, strategic, and multi-sectoral policy approach' is essential for dealing with the emerging epidemic of NCDs in Bangladesh. The quicker we understand and appreciate this, and mobilize our energy for actions, the better for the health of the country.

“

Non-communicable diseases are a major barrier to economic growth and social development. Their prevention and control must, therefore, be integrated into national and global development agenda.”

Mwai Kibaki, President of Kenya
UN high-level meeting on NCDs

“

Four in five deaths from NCDs now occur in low- and middle-income countries. Without decisive action, the NCD burden threatens to undermine the benefits of improving standards of living, education and economic growth in many countries.”

Martin Silink, President
International Diabetes Federation

CHAPTER ONE

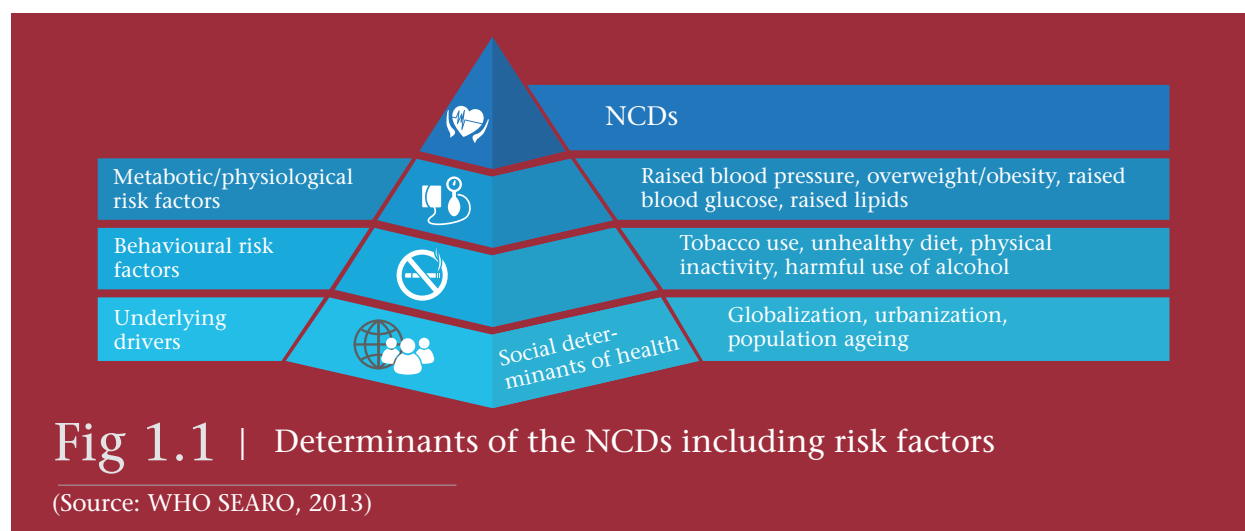
INTRODUCTION

SYED MASUD AHMED

The low-and middle-income countries (LMIC) are ageing, thanks to control of communicable diseases and economic ‘development,’ and they will become “old before they are rich” (WHO, 2016). These countries are at a cross road: the demographic transition (from declining fertility and increased life-expectancy) has opened up the opportunity of reaping ‘demographic dividend’ due to less children and elderly to be cared for by the income-earning population. On the other hand, epidemiological transition (from communicable to pre-dominantly non-communicable diseases, the ‘double burden’) has thrown up a challenge to the existing as yet mostly unprepared health system of these countries.

NCDs are chronic diseases that develop progressively, impacts on functional health with the passing of time,

and need health services sustained for a prolonged period including ‘end-of-life’ pain management and other services. The major NCDs include cardiovascular diseases, diabetes, cancer and chronic obstructive pulmonary diseases. Of lesser prevalence are the accidents and injuries, mental illnesses, and environmental (air, water and soil) pollution. Most of these NCDs have common lifestyle-related risk factors such as tobacco and alcohol consumption, inappropriate diet (less of vegetables and fruits and more of salt, sugar and fat), and low physical activity. The prevalence of risk factors and incidence of NCDs vary according to various social determinants of health such as SES, sex, race, ethnicity, religion, education etc. (CSDH, 2008). The challenge for the LMICs is that most of the health systems, plausibly so, are geared to address the



communicable diseases and mainly targets children and reproductive-age women. The challenge is also compounded by the fact that experiences from the high income countries (HIC) may not be valid, since the cultural values and norms between HICs and LMICs varied widely, necessitating new, culture-sensitive approaches to tackle the situation.

Bangladesh, as an aspiring middle-income country, is also under this trap. Its health system continues to cater to the needs of children and reproductive-age women with little preparedness and skills to address the emerging epidemic of the NCDs. There is also the need to align with the SDG target 3.4, which emphasizes the need to reduce mortality from the NCDs. Currently, NCDs account for 59% of total deaths in Bangladesh (17% cardiovascular and 11% chronic respiratory diseases, 10% cancers, 9% injuries, 3% diabetes and 10% other NCDs) (WHO, 2014). The elderly population aged ≥ 60 years is projected to increase to 19% of the total population by mid-century, potentially increasing the NCD burden and spending on health. Currently,

two important policy documents are being developed, the 7th five-year plan 2016–2020, and the fourth health sector plan (HPNSIP, 2016-2021). The main policies have been formulated, and the detailed operational plans are being drawn. Thus, this is the high time to discuss, debate, and strategise approaches and interventions to mainstream preventive NCD interventions in the existing PHC infrastructure in a sustainable manner.

Bangladesh Health Watch, a civil society advocacy initiative since 2006, is producing analytical reports on issues related to improvement of the health system from a critical perspective. So far, five reports on equity (BHW, 2006), health workforce (BHW, 2007), governance (BHW, 2009), universal health coverage (BHW, 2011), and urban health (BHW, 2014) have been published. In continuation, this time we picked up this emerging problem of NCDs for health and health system of Bangladesh in the era of the SDGs. We limited our enquiry to four major NCDs that are responsible for major chronic

disease burdens e.g., cardiovascular diseases, diabetes, cancer, and chronic respiratory diseases. A descriptive analysis of the current scenario is done and attempts are made to sort out key actions for future health system response. Two other conditions e.g., mental health illnesses (including disabilities) and accidents and injuries (including road traffic accidents) merit separate discussion on their own given importance for significant proportion of the population, which we hope to do in future reports.

This report has six chapters. After this brief introduction to the contents, the second chapter deals with the epidemiology of different NCDs prevailing in the country including prevalence of risk factors involved. The third chapter reviews the existing national policies on NCDs, and briefly deals with the challenges involved in its implementation. An inventory of various programmes and interventions currently in operation for NCDs is done next (Chapter 4), which is followed by a discussion of current health system's preparedness and limitations for addressing the management of the NCDs (Chapter 5). The final chapter (Chapter 6) makes a synopsis of the findings and draws out the key actions for addressing effectively and efficiently the challenge of NCDs. Each of the chapters is led by an expert in its own field, assisted by a group of peer researchers.

Epidemiology and risk factors (Chapter 2)

Like many LMICs experiencing a rapid epidemiologic transition in recent

years, NCDs now account for 59% of the total disease burden in Bangladesh (WHO, 2014 and Engelgau, 2011). A substantial proportion (>70%) of the rural population have three or more risk factors for chronic NCDs (Ahmed *et al.*, 2009). Ageing, lifestyle changes (related to diet, physical activity, smoking, alcohol, drugs), and rapid urbanization are considered the major driving force for this changed scenario. A third of the population in Bangladesh would be over 60 years by 2050, and will face the associated health system challenges to address the NCDs in a sustainable way.

NCD policies and challenges of implementation (Chapter 3)

There are a number of policies and strategies specifically directed towards a particular NCD, and a Strategic Plan for Surveillance and Prevention of NCDs 2011-2015 and The Multi-sectoral Action Plan for the NCD Control and Prevention (2016-2021). However, these are fragmented, and the country still lacks a comprehensive and integrated NCD prevention and control strategy and plan of action across the public and non-state sectors in the urban and rural areas, covering all population.

Inventory of current programmes on NCDs (Chapter 4)

A number of programmes in the public and private sectors are providing specific NCD services, albeit, in a fragmented manner not under a comprehensive plan. In the public sector the current major programmes are: Non Communicable Disease

Control and Public Health Intervention Program, NCD (awareness on NCD and NCD care, establishing dedicated NCD corners in government hospitals, and equipping facilities with necessary instruments); Upazila NCD project (developing capacity of the providers for NCD diagnosis and management); Health Care Development Project, HCDP (a PPP project to test a model of integrated care in urban and rural areas with a focus on the major NCDs); Tertiary level hospitals in CVDs, cancer, lung and kidney diseases, mental illnesses etc. to provide modern NCD care in diagnosis, treatment and management with relevant sub-specialties.

In the private for and not-for-profit/ NGO sector, institutions such as BADAS/BIRDEM, ASHIC, WBB Trust, BRAC, icddr, etc. are involved in providing both preventive and clinical services on specific diseases especially targeting the disadvantaged in remote/hard-to-reach areas as well as much needed research for generation of evidence for the most cost-effective, and appropriate mode of delivery of, services including developing the capacity for delivering such services.

Health System's preparedness to address NCD challenge (Chapter 5)

This chapter presents a brief review of the existing health infrastructure in the country and how far this is capable of meeting the challenges posed by the emerging burden of NCDs. Review of the existing health service delivery infrastructure found PHC deficient in appropriately trained health workforce,

necessary instruments for screening of NCDs which are functional, emphasis on prevention rather than cure, following a lifestyle approach to change every day behaviour, and lack of essential medicines necessary for treating common NCDs including mental illnesses. There are also gaps in secondary and tertiary levels with respect to number of available experts, diagnostics, treatment and follow-up services over time. There is no comprehensive and integrated surveillance system to monitor and evaluate NCD programmes and risk factors and attempts should be taken to make the database all inclusive. Raising priority for NCD issues in other sectors such as – the Ministry of Education, Ministry of Local Government, Ministry of Agriculture, and Ministry of Food needs further attention. Strong national stewardship of the MoHFW is needed to coordinate a meaningful multisectoral response for managing NCDs. PPP may be leveraged in initiating joint actions on many aspects of franchising the capacity building efforts for NCD prevention and management as a short-term measures.

Summary and action points (Chapter 6)

In this chapter, a review of the other chapters on epidemiology, policies and plans, services and infrastructure is done and three key challenges were identified:

1. *Mainstreaming NCD service provision at the PHC level: emphasising prevention based on modifiable risk factors through lifestyle changes*

Most current programmes and interventions around NCDs are focused on curative management rather than prevention, especially at the secondary and tertiary level health facilities/hospitals. Given the modifiable risk factors associated with NCDs (i.e. lifestyle changes, smoking, rise in obesity, urbanization, climate change, etc), it's important that primary level health facilities be made the focus of all cost-effective activities and thus appropriately equipped with trained health workforce, necessary equipments for screening, essential medicines for treating common NCDs, and a functional referral chain.

2. Absence of regulatory framework and lack of coordination at the national level

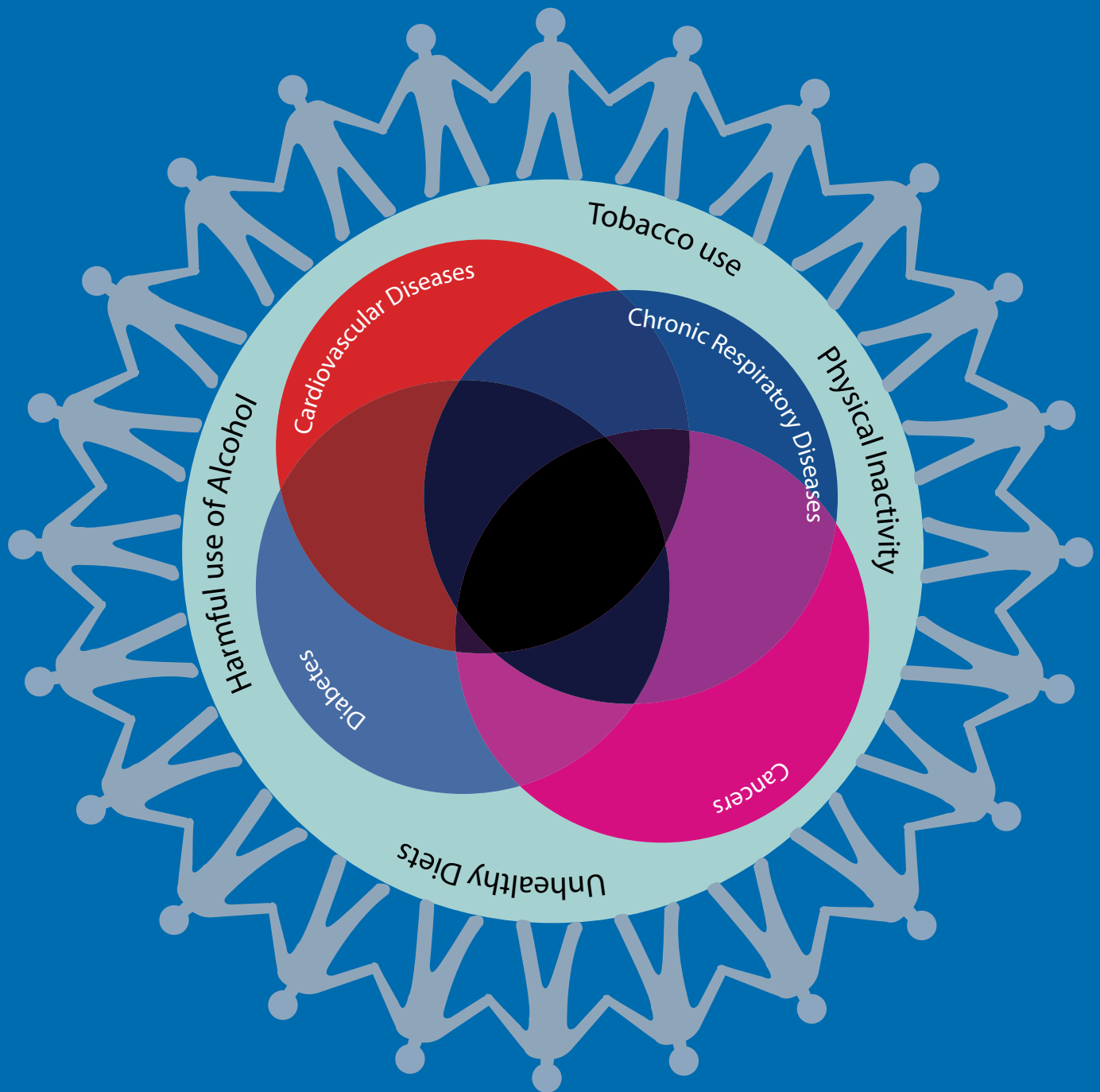
Regulatory mechanisms for control of tobacco and alcohol consumption, and environment (air, water, soil, and chemical pollution) including its enforcement is essential for prevention of NCD epidemic at the population level.

3. Lack of robust database at national level for NCD surveillance and monitoring, incorporating common data from rural and urban areas as well as public, for-profit private and other non-state sectors

Establishment of a comprehensive, all inclusive, integrated NCD risk factors and disease burden surveillance is urgently needed for informed decision making and design of innovative intervention.

To address these challenges, **five recommendations** are made for immediate action:

- ▶ **Build awareness** on the extent and importance of the NCDs at present and in near future and its linkage to poverty alleviation, economic development and achieving UHC at the policy, practitioners, and the community level.
- ▶ **Develop an integrated, multi-sectoral approach** to prevent and manage NCDs, with government, especially the MoHFW, in the stewardship role.
- ▶ **Strengthen the current health systems at all levels to address NCDs** with a focus on developing human and physical capacity at the PHC level for preventive services to affect modifiable NCD risk factors, and screening for early diagnosis and treatment including follow-up services for identified cases.
- ▶ **Establish a comprehensive surveillance system and registry** for the four major NCDs at the national level including monitoring and evaluation of NCD programmes, both on-going and the future ones.
- ▶ **Generate evidence** for delivering preventive and curative NCD services effectively and efficiently, keeping equity and universal coverage in focus.



CHAPTER TWO

EPIDEMIOLOGY OF NON-COMMUNICABLE DISEASES (NCDs) IN BANGLADESH

MALABIKA SARKER, MOHAMMAD DIDAR HOSSAIN,
LAL B RAWAL AND DEWAN S ALAM

SUMMARY

Like many low and middle income countries (LMICs) around the world, Bangladesh has been experiencing a rapid epidemiologic disease transition in recent years. This chapter describes the current scenario (prevalence, trends and risk factors) of the common and emerging NCDs in Bangladesh such as diabetes, hypertension, chronic obstructive pulmonary diseases (COPD), cancers, mental illnesses, and road traffic accidents (RTA). Given the limited resources and weak and fragmented health systems in Bangladesh, the country has already begun to face significant challenges to address the problems of NCDs. Consistent with this shifting epidemiological profile, preventable risk factors including tobacco use, unhealthy diets, physical inactivity, and alcohol are continuing as increasing problems in Bangladesh. The recent trends in NCD-related risk factors in Bangladesh clearly indicate future acceleration of NCD prevalence and deaths. This review also identifies the key issues positioning NCDs within the Universal Health Coverage (UHC) and Sustainable Development Goals (SDGs) in the country context.

INTRODUCTION

The global burden of non-communicable diseases (NCDs) is increasing rapidly and has silently reached a pandemic proportion (Mendis *et al.*, 2015 and WHO, 2014a). Currently, almost two-thirds of the total deaths globally are attributable to NCDs and nearly 80% of these deaths occur in low and middle-income countries (LMICs) (WHO, 2014a). What is even more significant is the fact that over 40% or 16 million of these deaths are premature deaths occurring under the age of 70 years, and the majority of these (82%) occur in LMICs. Among all NCDs, diabetes, hypertension (HTN), cardio vascular diseases (CVD), chronic obstructive pulmonary diseases (COPD) and certain cancers are considered as

major contributors responsible for more than half of the NCD related annual mortality, morbidity and health services utilization (Engelgau *et al.*, 2011, Bleich *et al.*, 2011 and WHO, 2011). Two other emerging causes of illnesses, mostly unrecognized or less prioritized in low income countries are, road traffic accidents (RTAs) and mental illness. While more than 1.2 million people die each year due to RTAs (WHO, 2015), mental health related problems constitute 14% of the global disease burden (WHO, 2016).

Like many LMICs, Bangladesh has been experiencing a rapid epidemiologic transition in recent years (WHO, 2011 and Karar *et al.*, 2009). Despite an overall reduction in mortality (Karar *et al.*, 2009, Bleich

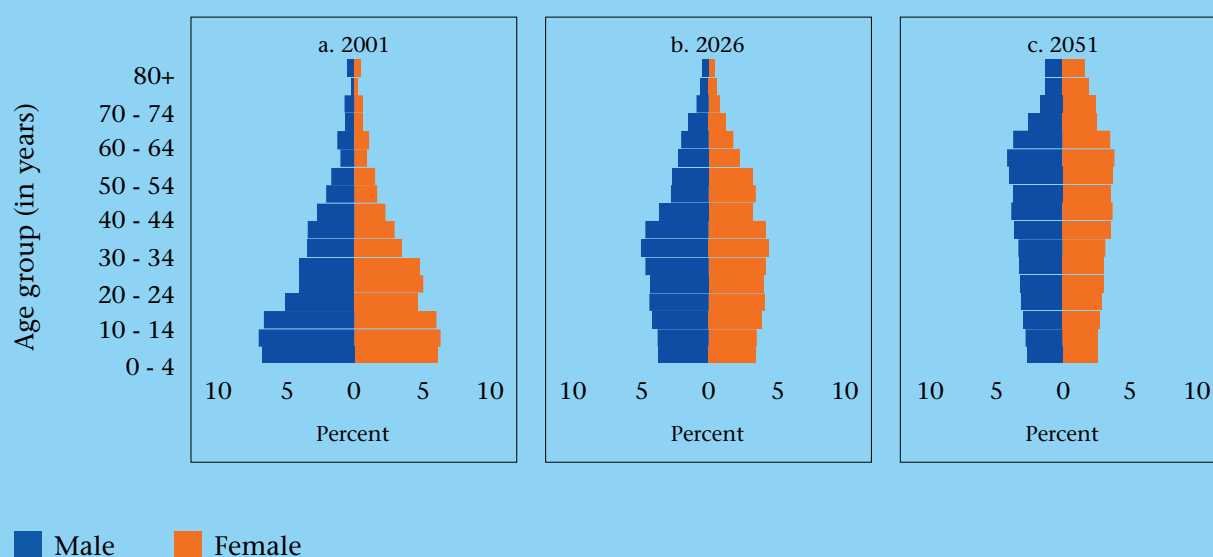


Fig 2.1 | Changing age structure of the population in Bangladesh, 2011, 2025 and 2051

Source: El-Saharty *et al.* 2013

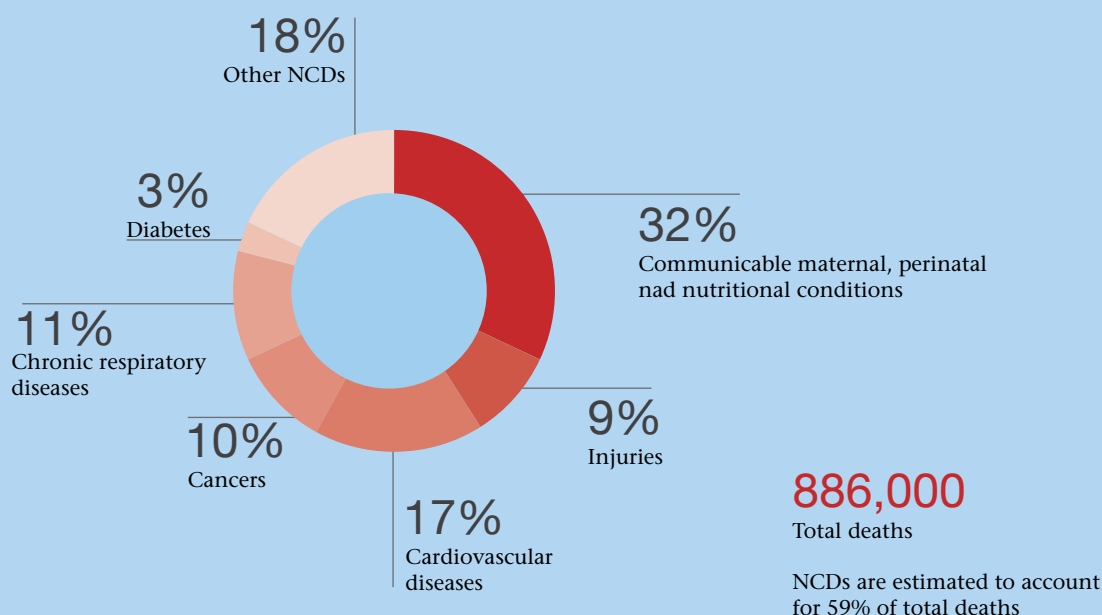


Fig 2.2 | Proportional mortality (% of total deaths, all ages, both sexes) in Bangladesh

Source: WHO, 2014c

et al., 2011, Alam *et al.*, 2013 and El-Saharty *et al.*, 2013), NCDs (inclusive of injuries) account for 59% of the total disease burden in Bangladesh (WHO, 2014c and Engelgau *et al.*, 2011).

A number of risk factors are responsible to the development of NCDs. Ageing population, lifestyle changes, and rapid urbanization are considered the major driving force for the NCD epidemic. Ageing is not just a predictor of higher incidence of NCDs but also a strong determinant of NCDs related complications and survival. It is estimated that a third of the population in Bangladesh would be over 60 years by 2050 (El-Saharty *et al.*, 2013), and given the limited resources and weak and fragmented health systems in Bangladesh, the

country has already begun to face significant challenges to address the problems of NCDs. In a risk factors prevalence survey in 2005, a substantial proportion (>70%) of the rural population were found to have three or more risk factors for chronic NCDs (Ahmed *et al.*, 2009).

This chapter describes the current scenario of the common and emerging NCDs in Bangladesh such as diabetes, hypertension, chronic obstructive pulmonary diseases (COPD), cancers, mental illnesses, and road traffic accidents (RTA). It also identifies the key issues positioning NCDs within the Universal Health Coverage (UHC) and Sustainable Development Goals (SDGs) in country context.

DIABETES MELLITUS

Prevalence and trends

Globally, Bangladesh is one of the top 10 high-burden countries with diabetes where an estimated 8.4 million people have diabetes and another 7.8 million have pre-diabetes (IDF, 2013). A meta-analysis showed an increasing drift of diabetes prevalence from 3.9% in late 1990s to 9% during 2006-2010 (Saquib *et al.*, 2012). Similarly, prevalence in rural Bangladesh population has increased more than threefold, from

2.3% to 7.9% during 1999-2009 (Bhowmik *et al.*, 2013). A more recent scoping review reported pooled estimate of diabetes prevalence from published studies from 1994 to 2013 to be 7.4% (Biswas *et al.*, 2016), the prevalence being higher among males compared to females in the urban areas, and the reverse in the rural areas. The burden of pre-diabetes is also noticeable, estimate to be 16.6% in a recent study on obesity (Alam *et al.*, 2016), and co-morbidity with pulmonary TB, 15.5% (Sarker *et al.*, 2016).

Risk factors

Well established risk factors for type 2 diabetes include older age, female gender, high BMI, abdominal obesity, physical inactivity, hereditary factors, and urban residence (IDF, 2015). Risk factors are widely prevalent in Bangladeshi people across gender and in both rural and urban areas (Zaman *et al.*, 2016). The prevalence is significantly higher in urban population compared to rural populations (Alam *et al.*, 2016 and Sarker *et al.*, 2016), and is skewed towards female, people with higher income and better education (Akter *et al.*, 2014 and Rahman *et al.*, 2015).

Obesity, in particularly abdominal obesity, is often referred as the prime determinant for the development of type 2 diabetes (Rahim *et al.*, 2007, Rahman *et al.*, 2007 and Akter *et al.*, 2014). Impact of obesity is even more pronounced when both BMI-based overweight/obesity co-exist with abdominal obesity which is common

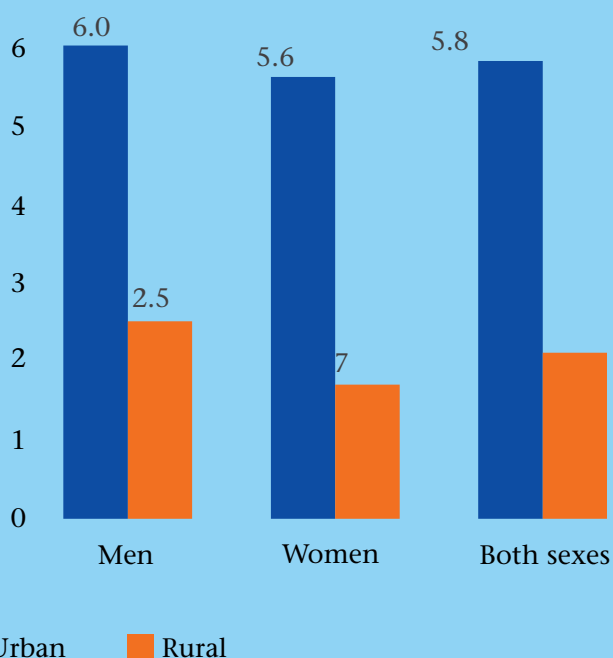


Fig 2.3 |

Prevalence of self-reported (documented) diabetes in rural and urban areas in Bangladesh

Source: WHO, 2011

in Bangladesh (Alam *et al.*, 2016). Several other NCDs often co-exist with diabetes, hypertension being one of the most shared comorbidities (Bhowmik *et al.*, 2013 and Akter *et al.*, 2014). Mental health problems, particularly

depression is common among hospitalized diabetic patients (62% reported depressive symptoms), the prevalence being higher (71%) among the females (Islam SMS *et al.*, 2015).

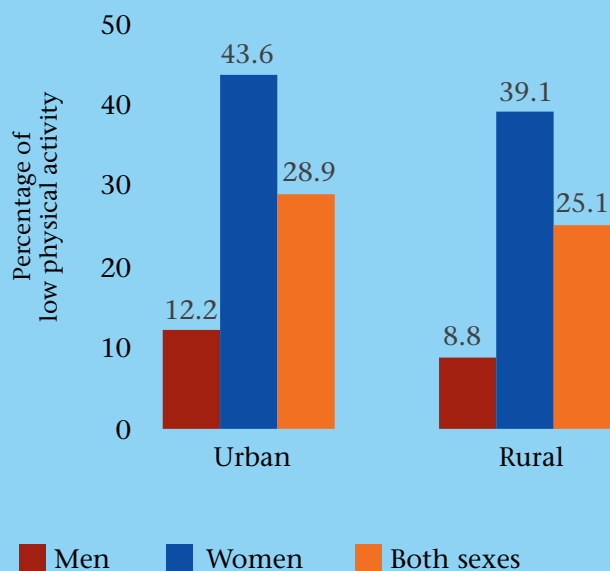


Fig 2.4 |

Prevalence of low physical activity (<600 MET-minutes) in rural and urban areas in Bangladesh

Source: WHO, 2011

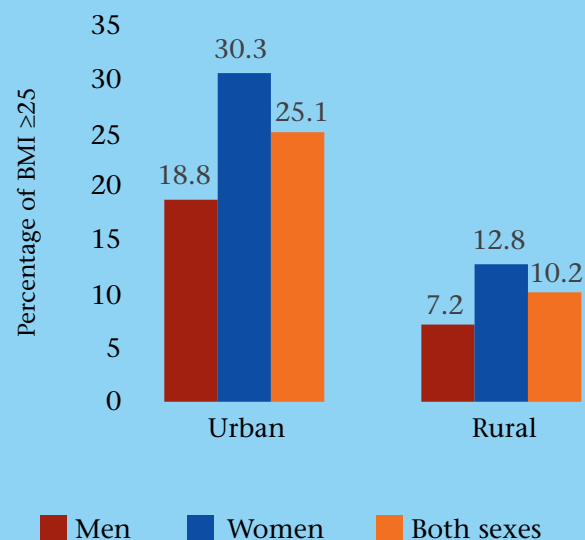


Fig 2.5 |

Percentage of people having BMI 25 (kg/m2) or above in urban and rural areas in Bangladesh

Source: WHO, 2011

HYPERTENSION

Prevalence and Trends

Hypertension is another major NCD problem, affecting over a quarter of the adult population in Bangladesh (Chowdhury *et al.*, 2016). A systematic review reported that around 14% Bangladeshi adults suffer from hypertension (Saquib *et al.*, 2012). A study in rural and semi urban surveillance sites of icddr,b found the prevalence of hypertension to be more than double that of in the semi-urban

population (24%) compared to the rural population (11%) (Alam *et al.*, 2014).

Risk factors

Older age, higher education, female gender and higher socioeconomic status are found to be associated with hypertension (Chowdhury *et al.*, 2016, Chowdhury and Chowdhury, 2015, Islam *et al.*, 2016, Mondal *et al.*, 2013, Khanam *et al.*, 2015 and Ahmed *et al.*, 2014). Overweight or obesity, is also a major risk factor for hypertension both in urban and rural areas (Chowdhury *et al.*, 2016, Khanam *et al.*, 2015 and Bhowmik *et al.*, 2015). Physical activity or sedentary lifestyle is often responsible for developing hypertension (Chowdhury and Chowdhury, 2015, Islam and Majumder, 2012, Islam *et al.*, 2016, Mondal *et al.*, 2013 and Islam *et al.*, 2015b). In Bangladesh, 27% of the population (10% men and 41% women) engage in low level of physical activity (<600 metabolic equivalent minutes per week) (WHO, 2011). High salt intake in particular constitutes, a major risk factor for hypertension (Mondal *et al.*, 2013, Ahmed *et al.*, 2014 and Islam *et al.*, 2015b) and salt intake in Bangladeshis is much higher than what is recommended by the WHO (Joint WHO/FAO Expert Consultation, 2003) or dietary guidelines for Americans 2010 (U.S. Department of Agriculture and U.S. Department of Health and Human Services, 2011).

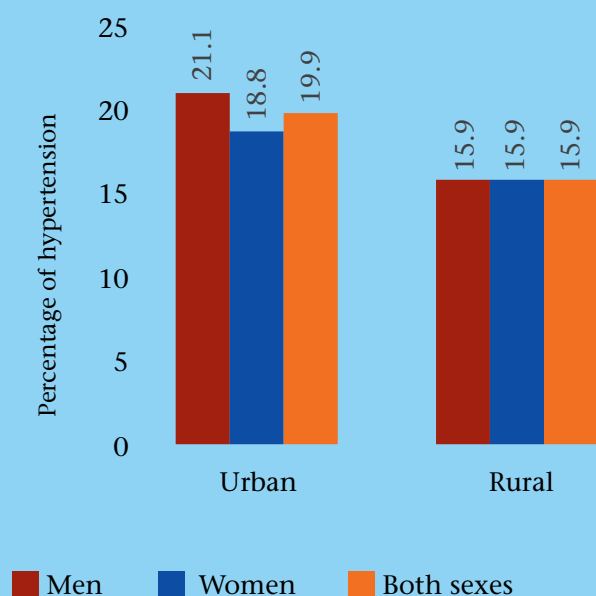


Fig 2.6 |

Prevalence of hypertension (blood pressure >140/90 mmHg or drug treatment) in urban and rural areas in Bangladesh

Source: WHO, 2011

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

Prevalence and Trends

COPD is an irreversible and progressively deteriorating respiratory disease characterized by progressive air flow limitation (Global Initiative for Chronic Obstructive Lung Disease, 2016). There is a dearth of information regarding COPD in Bangladesh, only few studies reported COPD prevalence in Bangladesh (Alam *et al.*, 2015, Bangladesh Lung Foundation, 2010 and Islam *et al.*, 2013). Although COPD is known to affect 10 to 13% of adults over 40 years of age in Bangladesh (Alam *et al.*, 2015), most of the patients remain undiagnosed until the condition becomes severe enough to cause respiratory distress and warrant immediate intervention. A facility based survey, conducted among respondents of 35 years of age or above, using operational severity criteria adopted from Global Initiative for Obstructive Lung Disease (GOLD), found the percentage of mild, moderate, severe and very severe COPD to be 43, 27, 20 and 10, respectively (Islam *et al.*, 2013).

Risk factors

Unlike diabetes and hypertension, prevalence of COPD is higher in rural population (Alam *et al.*, 2015, Bangladesh Lung Foundation, 2010). Major factors associated with COPD include smoking, older age, lower socioeconomic status, illiteracy, history of asthma, household solid fuel use and low BMI (Alam *et al.*, 2015, Bangladesh

Lung Foundation, 2010 and Islam *et al.*, 2013). Although males suffer from COPD more than females, the ratio is narrow in rural areas compared to urban areas which may be attributable to high exposure to indoor air pollution from burning of bio-mass fuel for cooking, again affecting the females more (Alam *et al.*, 2015). Majority of the COPD patients were active smokers, about 80% of them use to smoked 10 packs of cigarettes per-years; this may be compounded by other factors. Globally, 20 packs a year is set as the benchmark for in developing COPD (Bangladesh Lung Foundation, 2010). In a recent multi-country study including Bangladesh, low level of education, low household income and lower composite socioeconomic index is found to be the major determinants for developing the condition (Grigsby *et al.*, 2016).

CANCER

Prevalence and trends

Although Bangladesh has no population-based cancer registry, however, an estimated 122,715 new cases of cancer developed in 2012 which increased to 136,719 in 2015 (GLOBOCAN, 2012). Among males, lung cancer and mouth/oropharynx cancer rank as the top two prevalent cancers and cancer cervix uteri and breast cancer for women (Hussain, 2013). The cancer registry maintained by the National Institute of Cancer Research and Hospital (NICRH), Dhaka, showed lung cancer to be the leading cancer (17%), followed by cancers of breast (12%), lymph nodes

and lymphatics (8%) and cervix (8%) for sexes combined among all ages. In males lung (25.5%) and in females breast (25.6%) and cervical (21.5%) cancers were the predominant ones (National Institute of Cancer Research and Hospital, 2009). Several studies showed similar gender specific cancer prevalence in Bangladesh (Shahriar *et al.*, 2012 and Parveen *et al.*, 2015). In malignant hematological disorders more male (69%) are affected than females (31%) and acute myeloid leukemia is the most common condition among both the gender (Hossain *et al.*, 2014b).

Risk factors

Tobacco is the single most important modifiable risk factor for cancer

(Hussain and Sullivan, 2013). “The puffed rice” (locally known as ‘moori’) is made using urea fertilizer, a carcinogenic, that makes ‘Moori’ white and larger in size (Ali, 2013). The risk factors with high attributable fraction for cancers in men are tobacco smoking followed by chewing betel leaf (Shahriar *et al.*, 2012), and in women, these are weight gain, oral contraceptive use, sexually transmitted infections (Shahriar *et al.*, 2012, Iqbal *et al.*, 2015 and Jabeen *et al.*, 2013). Higher education and socioeconomic status, history of induced abortion, history of breast feeding, oral contraceptive use, current smoking, personal history of breast disease, family history of breast cancer and family history of other cancers are the risk factors, especially for the breast cancer (Jabeen *et al.*, 2013).

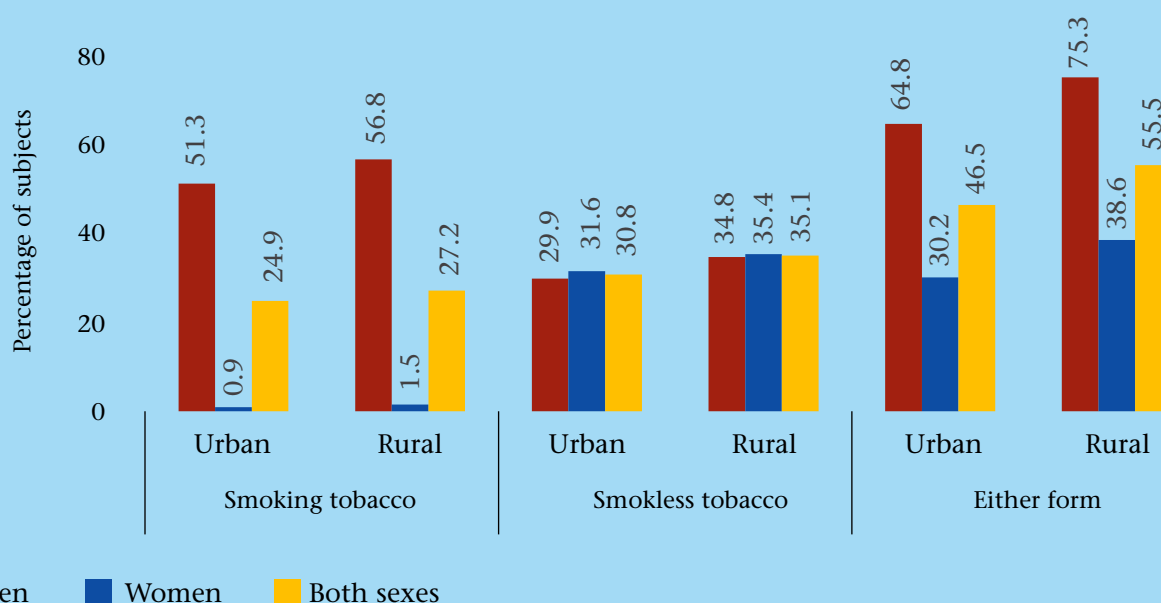


Fig 2.7 | Prevalence of current tobacco use, smoking or smokeless forms in rural and urban areas in Bangladesh

Source: WHO, 2011

MENTAL HEALTH

Prevalence and trends

Mental health is generally a neglected, under-researched and largely hidden public health problem in Bangladesh. A systematic review demonstrated the growing trend in the occurrence of mental disorder during 1975-2013. The prevalence varied from 6.5 to 31 percent among adults' and from 13 to around 23 percent among children (Hossain *et al.*, 2014a). A recent cross sectional study revealed that the prevalence of depressive symptoms among adolescents was 14% (Nasreen *et al.*, 2016). The prevalence of psychiatric disorders in urban community was found to be 28% in a 2003 study, where somatoform disorders were the most common condition among the respondents, followed by mood, sleep, anxiety, and substance related disorders (Islam *et al.*, 2003). Similarly, in rural area, 42% of the healthy participants were found to have mild depression, and 17% were severely depressed (Das *et al.*, 2014). Post-Partum Depression is not uncommon, in a longitudinal study among rural women, the prevalence of depressive symptoms was found to be 18% during pregnancy, and 46% during the postpartum period (Nasreen *et al.*, 2011).

Risk factors

Prevalence of depression was higher among females compared to males in almost all studies in Bangladesh (Islam *et al.*, 2015c and Firoz *et al.*, 2007). Pregnancy is found to be associated with depression and anxiety

among women from different socio economic status (Nasreen *et al.*, 2011 and Gausia *et al.*, 2009). Patients with diabetes are more likely to suffer from depression (Islam *et al.*, 2015a, Islam *et al.*, 2015c, Asghar *et al.*, 2007, Roy *et al.*, 2012, Bhowmik *et al.*, 2012 and Rahman *et al.*, 2011). Women's literacy, poor relationship with partner, forced sex, intimate partner violence, and previous depression are associated with ante partum and postpartum depression (Edhborg *et al.*, 2011 and Nasreen *et al.*, 2011). Depression in women is also higher when they have gestational diabetes mellitus (26%) compared to women without such comorbidity (10.38%) (Natasha *et al.*, 2015). Again among adolescents, older age (15-19 years), poor relation with parents and poverty are found to be associated with depressive symptoms in both sexes, as also; reproductive illness and sexual abuse in case of girls and family history of depressive symptoms in case of boys (Nasreen *et al.*, 2016).

ROAD TRAFFIC ACCIDENTS (RTA)

Prevalence and trends

The Road Traffic Accidents (RTA) is a significant cause of premature death and disability in young population (World Health Organization, 2014b). The increasing trend of RTA is a major threat to life among road users (paedestrians included) in Bangladesh. According to WHO (2014), the age adjusted death rate from RTA is 13

per 100,000 of population and ranks Bangladesh 109 in the world (WHO, 2014d). Almost all accidents occur at dry and sealed surface, and good and straight road at fair weather condition (Ahsan *et al.*, 2011) but 35% of total accidents on national highways are occurring only in 4% of total national highway kilometrage (Hoque *et al.*, 2006). It is responsible for 1-2% loss in GDP in the country and irreversible tragedy for victim families with loss of life and property. In Dhaka city, 43% of accidents involve pedestrians (Maniruzzaman and Mitra, 2005).

Risk Factors

Poor road conditions and reckless driving of commercial vehicles are the two foremost reasons for fatal road accidents (Sharmeen and Islam, 2011). Collisions involving trucks and buses are the major contributors (80%) to

road accident fatalities, especially pedestrian fatalities. In urban areas of Bangladesh pedestrians often represent up to 70% of road accident fatalities (Hoque, 2004). About 7% of these accidents and 3% of the people died involved cars. The car drivers are mostly young and middle aged (18-35 years) often without holding valid driver license accounting for nearly 79% of accidents (Ahsan *et al.*, 2011). Although drink driving is a major risk factor for RTA, no data exist what proportion of drivers involved in RTA were driving under the influence of alcohol.

Sustainable Development Goals (SDGs) and Way Forward

The 2030 agenda for Sustainable Development Goals (SDGs) recognized NCDs as a major challenge and positioned NCDs into the center of




the post-2015 development framework (United Nations, 2015). The SDGs agenda, in its goal 3.4 sets out the target of reducing one-third of the premature mortality from NCDs by 2030, through prevention, treatment and promotion of mental health and well-being. The framework also sets out the target of cutting down to half the number of global deaths and injuries from RTAs (SDG goal 3.6). Further, the public health approaches to NCDs prevention and controls, such as tobacco prevention and control, and prevention and treatment of substance abuse and harmful use of alcohol also have been highlighted in the SDG agenda for 2030 (United Nations, 2015).

In Bangladesh emphasizing the key SDG principle of “no one should be left behind”, policies such as the

Seventh Five Year Plan 2016-2020 were accordingly aligned (MoHFW, 2016). The Health Nutrition and Population Strategic Investment Plan (HNPSIP) sets out eight key strategic objectives, one of which directly addresses the issue of rapidly increasing problem of NCDs in the country and its’ associated risk factors with an aim to “promote healthy lifestyle choices within a healthy environment” (MoHFW, 2016). The plan has further given due importance to multi-sectorial approaches for NCDs prevention and control, with the need for involving all relevant sectors such as education, infrastructure development, finance, agriculture, environmental engineering etc. for sustainable tackling of NCD issues over time.







CHAPTER THREE

NATIONAL POLICIES ON NCDs AND CHALLENGES OF IMPLEMENTATION

A M ZAKIR HUSSAIN, A H M ENAYET HOSSAIN AND
FARUK AHMED BHUIYAN

SUMMARY

This chapter provides a critical insight into existing national policies on NCDs and the barriers in implementing them. With the burden of NCDs in the country in recent times, a number of policies albeit in a fragmented manner are being formulated to tackle the situation in the coming days. This chapter also presents an analysis of six major policies that incorporated NCDs to be addressed. Health, Nutrition and Population Strategic Investment Plan, HNPSIP 2016–2021 suggested lifestyle approach to reduce the treatment cost without giving any specific direction. The Seventh Five-year Plan 2016–2020 emphasised on health promotion recognizing role of private sector but growing concerns of environmental pollution, waste management and mental illness not addressed. The Multi-sectoral Action Plan for the NCD Control and Prevention (2016–2021) suggested involvement of different stakeholders without clear definition of roles and responsibilities. Strategic Plan for Surveillance and Prevention of NCDs in Bangladesh 2011–2015, identified key risk factors and major challenges to improve NCD management and situation. National Communication Strategy and Action Plan for Reduction of NCD High Risk Behaviours in Bangladesh, 2014–2016, identified five areas of action to generate awareness against NCDs. National Health Policy 2011, none of the aims and principles of this policy have mentioned NCDs specifically. The chapter concluded that the country still lacks a comprehensive and integrated NCD prevention and control strategy and plan of action across the public and non-state sectors in the urban and rural areas, covering all population.

Policy, simply, is “whatever governments choose to do or not to do” (Dye, 1984). A policy, according to Anne Schneider and Helen Ingram (Schneider and Ingram, 1997), not only includes laws and regulations that govern a particular policy area but also the procedures of implementation—practices, texts, symbols, discourses—items that may often not be formally written down but are very real in practice. With the tangible increase in the burden of NCDs in the country in recent times, with all its challenges, a number of policies albeit in a fragmented manner are being formulated to tackle the situation in the coming days. This chapter presents a descriptive analysis of these current policies relevant to NCDs, and is followed by a discussion of the challenges involved in its implementation.

HEALTH, NUTRITION AND POPULATION STRATEGIC INVESTMENT PLAN, HNPSIP 2016–2021

One of the ten key driving forces (number seven) of the forthcoming HNPSIP 2016–2021 involves “*tackling the rising burden of NCDs through cross-sectoral work to establish healthy lifestyles and healthy environment.*” A lifestyle approach is suggested for “*prevention, with a focus on young people to head off the rise in NCDs, through lifestyle and environmental actions, and the support and care for those suffering from NCDs.*” The document correctly states that investments in lifestyle choices and healthy environments

will reduce future costs of treating rapidly expanding burden of chronic NCDs (MoHFW, 2016). The projected increase in NCDs, if unchecked, will require huge investments in specialized medical centres, diagnostics, and highly trained specialist health staff and expensive medication. Given the funding gap that exists in the health sector in Bangladesh (currently less than one percent of GDP is invested in health by the public sector), this will be a financial burden that the country may find difficult to afford.

Reaching the young with effective public health messages for healthy lifestyle (e.g., related to diet, exercise, recreational drug abuse, etc.) has been advocated for addressing the impending epidemic of the NCDs. Besides, regulatory regime for better environmental conditions such as enforcement of existing laws on air, water and soil pollution, measures to control risk behaviours (e.g., smoking), promote road and waterway safety, etc. is emphasized (HNPSIP 2016-2021). So far so good! However, one would expect that, as a strategic document, it should have also answered the ‘how’ part, since whatever has been described is not new. For example, the document could have stated what it would take to convince people to adopt a healthy lifestyle? What are the areas that need to be looked into to improve the environment and how to reach those who need NCD-related services? The document also has hardly anything on addressing gender-based violence, road traffic accidents and injuries and mental health issues.

THE SEVENTH FIVE-YEAR PLAN 2016 - 2020

The seventh five-year plan emphasizes *“massive health promotion and prevention efforts for impending NCDs.”* It recognized *“the role of the private sector in the treatment of NCDs”* but expressed concern about poor regulation. The document exhorts that the response from the government needs to take into account how to increase efforts for prevention of NCDs and how to ensure a well regulated service delivery system for NCD treatment (Bangladesh Planning Commission, 2015). But the document does not detail out exactly what should be done and how. Growing concern about environmental pollution (soil, water, air), especially in Dhaka urban area, has been mentioned but not been connected to NCDs. Enumeration of some of the NCD-related hazards in this regard could have been useful in designing appropriate measures to address these. Management of wastes in health facilities is another important environmental health issue in which limited progress has been made. But what relation medical and e-wastes have with health in general, and NCD in particular, has not been mentioned. Background paper on health strategy for preparation of seventh five-year plan has given emphasis on mental health aspects: lack of awareness about it and needed services including overcoming social stigma. This is laudable, given the emerging importance of mental health illnesses in the country.

The suggestion given for cancer screening and a well-coordinated single

surveillance system for NCD control programme is a good suggestion that the system can adopt. It has also been suggested that in the absence of a health sector research strategy, well-coordinated and concerted efforts will not be possible. The other challenges the document mentions is about using research findings for the benefit of people through appropriate policy/programmatic interventions. It rightly mentions that the coastal belt people affected by salinity are in danger of NCDs like hypertension and pregnancy complications like pre-eclampsia and eclampsia. Breakthrough longitudinal research on fetal origin of adult disease has given us new understanding on relationship between under-nutrition and subsequent NCDs.

The National Nutrition Policy 2015 dealt quite elaborately on nutrition-related NCDs, including rising trend of obesity and consequences of obesity and overweight (MoHFW, 2015). The policy puts emphasis on social and behavioural change communications to warn people on the consequences of consuming fatty and salty foods and encourage them to include more vegetables and fruits in their diet.

THE MULTI-SECTORAL ACTION PLAN FOR THE NCD CONTROL AND PREVENTION 2016 - 2021

This three-year action plan suggests setting of a multi-sectoral NCD coordination committee (MNCC) by the prime minister and chaired by the health minister. The NCDC programme of the DGHS will serve as the Secretariat to the MNCC

and will organize six annual MNCC meetings. Among its activities include: engagement of local governments; awareness building for NCD prevention among stakeholders including policy makers and politicians; setting up healthy cities, schools and work places; scaling up PEN interventions in primary health care and upazila health complex, and making basic NCD drugs available at the primary health care level. The document also suggests that the cabinet will be made accessible to stakeholders, donors, and media (Government of Bangladesh, 2015). The success of the implementation of the strategy and the action plan will depend on how much the stakeholders can be involved in the bilateral dialogue and partnerships. The document, however, segregates the implementing and the district level taskforces without any linkage between them. This does not reflect well on the roles, responsibilities, and the ambits of the district level health systems.

STRATEGIC PLAN FOR SURVEILLANCE AND PREVENTION OF NCDs IN BANGLADESH 2011 - 2015

The strategic plan 2011-2015 has identified key risk factors which influence the onset and course of chronic diseases such as tobacco consumption, unhealthy diet (deficient in vegetables and fruits and high fat content), physical inactivity, raised blood pressure and blood glucose, air, water and soil pollution, etc. To ameliorate current situation, it underscores three major areas of action in i) surveillance of NCD risk factors and

NCD disease burdens for generation of evidence for policy formulation and effective action; ii) health promotion and prevention of NCDs through development of supportive environments, strengthening community actions and capacity building, and orient health services according to people's need. But it is not clear on how to create supportive environment and what community actions are to be strengthened; and finally, iii) effective strategies to improve NCD care beginning from the PHC level.

Major challenges identified by the strategy document include capacity development at different tiers of health system for providing NCD care, providing essential NCD drugs at the PHC facilities, institutional arrangements for long-term follow-up and care, establishing a comprehensive database, and enforcement of NCD-relevant laws. Besides, developing intra and inter-ministerial coordination with MoHFW as the lead agency, and coordination with the non-state sectors, community participation for NCD management, and emphasizing prevention over treatment are other challenges worthy of note (DGHS, 2011). To improve the situation, measures such as developing a common platform for surveillance with participation of all stakeholders, prevention and management of NCDs in the community, and promoting research for cost-effective delivery of NCD services are advocated. The strategy document also lays importance to leadership, multi-sectoral partnership and community mobilization, apart from other

interventions that have been mentioned in all NCD-relevant documents, e.g., advocacy, research, surveillance, etc. It also envisages development of collaboration among educational institutes related to NCD care to include relevant materials in the curricula, and development of standards and protocols for NCD services at all levels of health care services.

NATIONAL COMMUNICATION STRATEGY AND ACTION PLAN FOR REDUCTION OF NCD HIGH RISK BEHAVIOURS IN BANGLADESH 2014 - 2016

The strategy document aimed to develop effective and sustainable communication to generate awareness for reduction of NCD high-risk behaviours. It advocated five areas of action to achieve this – a) campaign for reducing high risk behaviours (media campaign, sensitizing the community leaders and teachers, developing awareness among the media persons, policy dialogues, etc.); b) developing appropriate tools/methods for building awareness customized to specific audience (IEC and BCC materials for NCD, using IT/mobile phones for awareness campaigns, organizing dissemination meetings, etc.); c) capacity building at individual and institutional levels; d) prioritizing research for communicating to the hard-to-reach population; and finally, e) review and updating the existing regulatory framework for addressing the new challenges of NCDs. A monitoring and evaluation protocol

oversees the performance of the interventions (DGHS, 2013).

NATIONAL HEALTH POLICY 2011

Health Policy 2011 in its 19 priority aims did not mention NCD, neither in the 16 principle policies. NCDs are mentioned under the caption of ‘Challenges’ which included blindness, mental health, injury, drowning, burn, and deafness. No relationship was drawn between environment and NCD or between food and NCD (MoHFW, 2012). No priority was drawn on research. It agrees though that behaviour surveillance is not adequate. The policy did not associate lifestyle with NCD. In the strategy part, NCD prevention and treatment were mentioned but not on how and what should be done in this regard. The policy document named diabetes, hypertension, heart disease and arsenicosis, especially on awareness and lifestyle change-related interventions but not much on other NCDs.

DISCUSSION

The existing policies, acts and implementation strategies relevant to the management and prevention of the NCDs are examined and suggestions given in passing above while suggesting on how to better operationalize implementation of policies, including bridging the gaps identified. These suggestions are expected to contribute to the formulation of the current seventh

five-year plan and operationalising the next health and population sector plan. Besides bridging the gaps in the existing documents for future revisions and updating, the regulatory bodies have to be strengthened effectively and urgently. Analysis would be useful to first identify the weaknesses and strengths before measures are taken for a regulatory regime. In future, wide participation of the beneficiaries and experts should be ensured while updating these crucial documents. For developing healthy city/healthy community, it is imperative that the beneficiaries are involved from the beginning so that they own the policies, strategies, plans of action, and take interest in their implementation.

For carrying out the NCD prevention and control agenda forward,

strengthening of the relevant management structure including line directorship is warranted. There are two programme managers and four deputy programme managers to plan and implement NCD control programmes. What is needed now is to develop preventive and control programmes based on the evidence generated through studies sponsored by the line director's (LD) office. It is necessary that the line directorship develops necessary sector-wide vision and inculcates the required stewardship role across the sector for implementing the agenda, involving all the relevant sector-wide stakeholders.

Hospital-based surveillance data are not submitted timely from all the public sector hospitals, while no



private sector hospital is obliged to submit such data. Health management information systems' (HMIS) capacity is still weak to ensure collecting and managing data from all the sources. LD might work with HMIS on how to collect and manage data regularly from the reporting units. Cancer registry and sentinel surveillance sites need to be established. Periodic steps survey should be conducted for finding out changing trends in the NCD risk factors over time for appropriate adjustments in NCD programmes.

Capacity exists even at the community clinic level to screen hypertension and diabetes but it has not been put into service routinely and regularly. Additionally, chronic pulmonary obstructive diseases, cancer (cervical,

breast, lung and prostate cancer in particular), mental health problems (psychosis, schizophrenia and manic depression), and injury-based (road traffic and disaster related) services need to be established at all tiers based on competency and efficiency. These services should include tier-based capacity for clinical examination, medication, advice, and referral. Preventive measures for all forms of tobacco need to be taken up efficiently and effectively. Bureau of Health Education, DGHS conducts some health communication programmes on NCDs, which should nevertheless be a regular feature and should aim general public through interpersonal communication, especially in the rural areas.





CHAPTER FOUR

CURRENT PROGRAMMES FOR PREVENTION AND MANAGEMENT OF NON-COMMUNICABLE DISEASES IN BANGLADESH

ALIYA NAHEED, SUNJIDA BINTA ALI AND AHM ENAYET HUSSAIN

SUMMARY

This chapter is an inventory of current programmes and activities for prevention and management of non-communicable diseases (NCD) in Bangladesh. The activities include awareness and health literacy capacity building, diagnostics and treatment management implemented by the public and non-state sectors including the non-government organizations (NGO). Findings reveal that the government's role in managing NCDs is limited mainly to provide health education to people and capacity development of the health workforce with less focus on preventive care at primary and secondary levels, and available services typically concentrated in urban areas in tertiary facilities. While the NGOs, private providers (for- and not-for-profit) and practitioners of traditional medicine play a large role in service delivery there is lack of comprehensive and systematic efforts, and proper monitoring and surveillance due to constraints in both physical and human resources.

INTRODUCTION

In Bangladesh's Health Population and Nutrition Development Plan (HPNSSP 2011-2016) (MoHFW, 2011), non-communicable diseases (NCD) are defined in two broad categories - conventional and non-conventional. Conventional NCDs relate to cardiovascular disease (CVD), diabetes, chronic obstructive pulmonary disease (COPD), cancer, arsenicosis, mental health disorders, hearing disabilities, and oral disease. Road injuries and violence against women are grouped under non-conventional NCDs (MoHFW, 2011). Bangladesh has a long history of specialty hospitals and foundations in both public and private sectors (for-profit and not-for-profit, NGOs), which provide dedicated treatment for specific NCDs. Although the current health sector plan includes prevention and care of NCDs at all levels to be a high public health priority, there has been little focus on prevention over the conventional programmes targeting maternal, neonatal and child health for achieving the Millennium Development Goals (MDG) (Alam *et al.*, 2013). The NGOs and private providers (formal and informal) also play important roles in NCD-related service delivery, mainly in rural areas.

Due to their high prevalences and mortality rates, this chapter will mainly focus on programmes and interventions directed towards CVDs, diabetes, cancer, and COPDs only.

AVAILABLE SERVICES FOR CARDIOVASCULAR DISEASES (CVD) AND HYPERTENSION

CVDs including hypertension and their consequences account for 17% of all deaths in Bangladesh (WHO, 2014). According to Bangladesh Health Facility Survey 2014, 16% (28% excluding Community Clinics or CC) of all health facilities are able to diagnose, prescribe treatment for and manage patients with CVDs. Ten percent of the CCs and MCWCs provide any cardiovascular services. The services at these facilities are limited to the measurement of blood pressure or referrals. Over half of the urban facilities provide services for CVDs compared to 13% of the rural facilities. Among the facilities, 11% had at least one staff member who received in-service training in CVDs, 95% had a stethoscope, and 88% had a blood pressure instrument, excluding the CCs (Table 4.1).

Table 4.1 | Availability of services, trained staff, and equipment for CVD care within the health facility

Facility type	No. of facilities	Number of facilities offering services for CVD	Facilities offering services for CVD (%)	Trained staff (%)	Equipment		
					Stetho-scope (%)	Blood Pressure apparatus (%)	Adult scale (%)
District and upazila public facilities	47	34	71.10	20.1	98.2	93.8	74.5
DH	5	5	95.2	16.9	98.3	96.6	74.6
MCWC	8	1	9.8	0.	88.9	88.9	100
UHC	35	28	80.8	21.2	98.4	93.4	73.9
Union level public Facilities	374	62	16.6	2.9	91	85.9	57.5
UHFWC	149	24	16	2.4	91.3	80	57.8
UHFWC (upgraded)	117	13	11.3	2.2	85.6	85.6	68.8
USC/RD	108	25	23.2	3.8	93.7	91.8	51.1
Public community clinic (CC)	1010	97	9.6	14	93.3	80.9	91.4
NGO clinic/hospital	81	30	36.5	10.4	100	100	82
Private hospital	36	27	77	6.9	97.9	97.9	75
Urban	130	71	54.5	12.1	98.7	97.2	75.6
Rural	1418	179	12.6	10.4	93.1	84.4	78.6

Source: National Institute of Population Research and Training (NIPORT) (2014) Bangladesh Health Facility Survey (HFS), 2014

Notes: DH= District Hospital, UHC = Upazilla Health Complex, UHFWC= Union Health and Family Welfare Center, USC/RD= Union Sub Center/Rural Dispensary

AVAILABLE SERVICES FOR PREVENTION AND MANAGEMENT OF DIABETES

In Bangladesh the prevalence of diabetes among adult is 7.4% (International Diabetes Federation, 2015). It is more prevalent in female (10.3%) than male (9.4%) (Akter *et al.*, 2014). Bangladesh ranked 8th out of ten countries with largest number of people with diabetes. According to Bangladesh Health Facility Survey 2014, 18% (26% excluding CCs) of health facilities in Bangladesh diagnose, prescribe treatment for and manage patients with diabetes. As expected, diabetes services are most likely to be available in district hospitals (DH) (95%), private hospitals (80%), and UHCs (81%). Urban facilities (57%) are more likely to offer diabetic services than rural facilities (14 %). Private hospitals and NGO

facilities were much more likely to have the capacity to conduct all three tests (blood glucose, urine protein, and urine glucose) than public facilities. None of the CCs conducted urine protein tests. Few facilities offer essential medicines for treating diabetes if available. The CCs and union level public facilities do not have the capacity to offer medications for treating the illnesses because a prescription from physician is required. Among the other facilities, private hospitals and district hospitals were more likely to have medicines for management of diabetes (Table 4.2).



Table 4.2 | Availability of diabetes services, trained staff and equipment for diabetes services within the health facility

Facility type	Number of facilities	No of facilities offering services for diabetes	Facilities offering services for diabetes (%)	Trained staff (%)	Equipment		
					Blood pressure apparatus (%)	Adult weighing scale (%)	Height board (%)
District and upazila public facilities	47	34	70.7	13.8	93.7	74.4	55.6
DH	5	5	95	8.5	96.6	74.6	57.6
MCWC	8	1	8.7	0	87.5	100	37.5
UHC	35	28	80.7	15.1	93.4	73.8	55.7
Union level public Facilities	374	41	11	1.4	83.2	51.6	24
UHFWC	149	15	10	1.3	80	47	18.6
UHFWC (upgraded)	117	9	7.5	3.4	78	78	22
USC/RD	108	17	16	0.5	88	42	30
Public community clinic (CC)	1010	137	13.6	30.4	75.6	87	64
NGO clinic/hospital	81	34	42.3	12.5	100	82.8	59.3
Private hospital	36	29	80	11.8	98	74	40
Urban	130	75	57	11	97.4	76	53
Rural	1418	200	14	23	79.5	79	54

Source: National Institute of Population Research and Training (NIPORT) (2014) and Bangladesh Health Facility Survey (HFS), 2014

PUBLIC SECTOR PROGRAMMES AND INSTITUTES FOR PREVENTION AND MANAGEMENT OF NCDs

NCDC project of the Directorate General of Health Services (DGHS)

The Non-communicable Disease Control and Public Health Intervention Programme launched by DGHS (NCDC project of DGHS) in 2007 aimed to spread awareness about NCDs and NCD care with emphasis on CVD and cancer. This programme has so far successfully developed awareness of NCDs among senior citizens and provided equipment for improving the quality of NCD care (Bleich *et al.*, 2011). Also, the DGHS has established 'NCD corners' in selected upazila health complexes (UHC) in parallel with the existing services. Dedicated to providing services for CVDs, diabetes, and chronic respiratory diseases (asthma and COPD) and screening for certain cancers, this initiative serves as a key approach for NCD service delivery in Bangladesh. Each NCD corner is planned to have dedicated staff and equipment, and has been piloted in three UHCs (Alam *et al.*, 2013).

Upazila NCD Project

In 2007, the Ministry of Health and Family Welfare (MoHFW) introduced this project with the aim of developing NCD management capacity among public and private providers in the upazilas(sub-district). They started with three upazilas and later on expanded to

137 upazilas by 2011/12. The project trained healthcare providers on NCDs and their detection and management at primary healthcare (PHC) level, established dedicated NCD corners with one doctor and two nurses, equipped the upazilas with necessary equipment, ensured the availability of common anti-hypertensive and anti-diabetes medicines, and developed referral linkage for advanced management of the NCD illnesses (Bleich, *et al.*, 2011). The focus of this project is mainly on diabetes and hypertension.

Health Care Development Project (HCDP): A public-private partnership (PPP) project.

Many countries, including Bangladesh, now acknowledge the role of private sector in fighting complex health challenges and are incorporating PPPs in their development discourse. The government of Bangladesh envisions PPP to be "a win-win relationship between the government and various private sector players for the purpose of delivering a service by sharing the risks and rewards of the venture under a contractual obligation" (GoB's Policy and Strategy for PPP 2010) (MoF, 2010). It is true that PPPs are not a panacea for NCD epidemic, but they are important in broader healthcare service provisions. Current such projects are described below.

A large scale public-private partnership (PPP) project for general health care delivery (Health Care Development Project, HCDP) is supported by the government of Bangladesh (GoB), Dutch government and a

Consortium of local banks. The aim of the programme is to test a model of integrated care service delivery in urban and rural areas focusing on the major NCDs (BADAS, 2011 and Bleich *et al.*, 2011). A network of 20 hospitals and health centres are being developed in and around Dhaka, as well as in northern parts of Bangladesh, upto the upazila level. It provides free service (insulin, glucometer, children camp, other services), primary care (clinical service, training on glucometer operation and insulin injection for the patient, behaviour change communication etc.), secondary and tertiary care (diagnostic intervention, advanced surgical interventions, laboratory tests, radiology and imaging interventions), and general health care. It is also implementing programme on awareness, education and primary prevention of diabetes and other projects on diabetes prevention programme (e.g., diabetes prevention intervention study, extension of diabetes care, and changing diabetes in children programme) (BADAS, 2012).

National Institute of Cardiovascular Disease (NICVD)

This tertiary hospital in public sector aims to establish modern cardiovascular care services in the country and to develop trained manpower in this field to fulfill emerging demand. NICVD provides outpatient services (consultation, non-invasive investigations, and cardiac surgery) and inpatient services (support services, counseling for diet, nutrition, lifestyle, emergency services, invasive diagnosis, etc.). It developed the first pediatric cardiology department of

the country and is providing both invasive and non-invasive services. It recently established telemedicine service, which is supporting doctors and patients in remote areas of the country with expert opinion. They also conduct training programmes for nurses (CCU, ICU, OT) supporting technologists, and non-government doctors so that they may provide better services to the community. Post-graduate medical courses and diplomas are offered to doctors, to help them provide specialized cardiac care at different government/non-government hospitals in Bangladesh and abroad (NICVD website).

NOT-FOR-PROFIT PRIVATE SECTOR FOUNDATIONS/ INSTITUTIONS FOR PREVENTION AND MANAGEMENT OF NCDs

National Heart Foundation

National Heart Foundation, a not-for-profit private sector hospital, provides diagnostic services (Coronary Care Unit or CCU), outdoor and indoor services, pathology and biochemistry laboratory, blood bank facility, diagnostic paediatric cardiology, radiology and imaging, and clinical services (surgical and non-surgical interventions). Preventive services include rehabilitation programmes for post-MI, post-surgical and post PTCA cases, exercise programme, counseling for life-style modification, dietary changes, post-surgery care, heart camps, mass-oriented seminars and rallies, observance of World Heart Day, World Hypertension Day, obesity

clinic, publications, tobacco cessation services affiliated with four medical college and hospitals (NHF, 2010,2011 and 2014).

Ibrahim Cardiac Hospital and Research Institute (ICHRI)

Another not-for-profit private hospital, aims to prevent and treat cardiac patients, creates awareness on risks associated with development of CVDs and develops skilled manpower. It has already established itself as a highly reputed cardiac institute in the country with a team of dedicated doctors, nurses, technicians and efficient support service management team. It has a 150-bed hospital with facilities for invasive and non-invasive cardiology, cardiac surgery, thoracic surgery, vascular surgery, cardiac rehabilitation, and radiology including volumetric CT angiogram (BADAS, 2012).

Bangladesh Institute of Research & Rehabilitation of Diabetes, Endocrine and Metabolic Disorders (BIRDEM)

An institute of BADAS, BIRDEM provides diagnostics as well as primary and secondary clinical care of diabetes for both outpatients and inpatients. The institute has a 600-bed modern multi-disciplinary hospital with approximately 500,000 registered diabetic patients. Around 3,000 patients attend the OPDs, services being provided in two shifts– morning and evening. BIRDEM Academy also runs 16 post-graduate courses in various disciplines of medical science. It

conducts research for which it has been designated as WHO Collaborating Centre for Research on Diabetes and its Complications. It provides a wide range of services, especially for poor, which include recording socio-economic profile of patients, follow-up of poor patients, and providing insulin and medicine free of cost, education, skill-building training, rehabilitation services, etc. (BADAS, 2012).

NOT-FOR-PROFIT NON-GOVERNMENT ORGANISATIONS FOR PREVENTION AND MANAGEMENT OF NCDs

Besides the above-mentioned programmes, there are other small-scale programmes and interventions implemented by different NGOs and civil society organizations (CSO), which are described below.

BRAC

The community-based NCD programme of BRAC aims to aware people on the importance of healthy lifestyle to prevent onset of NCDs, and screening risk factors for early detection of hypertension and diabetes including referral to appropriate facilities. The NCD service is being provided by the community health workers (CHW) (ShasthyaSebikas/ ShasthyaKormis) trained in measuring blood pressure and blood glucose (with glucometer). They refer potential patients to next level of partner clinics/ health centres for confirmation of diagnosis and initiation of treatment.

The CHWs then ensure compliance with case management protocols by the patients, besides educating them on self-management of the diseases. The BRAC programme is now operating in 139 upazilas of 61 districts and nine city corporation areas.

ICDDR,B

Two projects of icddr,b that have gained immense success and

acceptance from the government are the NCD scorecard to increase awareness on prevention and control of NCDs, and the Control of Blood Pressure and Risk Attenuation-rural Bangladesh, Pakistan, Sri Lanka Feasibility Study (COBRA-BPS)(icddr,b, 2012).

NCD Scorecard

The scorecard developed by icddr,b has four domains with specific indicators, e.g. governance (plans and leadership), risk factors (tobacco use, physical inactivity, poor diet, and harmful use of alcohol), surveillance and research, and health systems response (percent of population dying from NCD under 70, percent of GDP spent by government on health, and number of health workers per 10,000 population). In each of the 23 countries included in the survey in 2011, the representatives of the government, NGOs, academia, and the private sector were asked to score performance in a scale of 0 (no activity) to 3 (highly adequate), and performance was measured as a percentage of the maximum possible aggregated score (Table 4.3). As is evident, Bangladesh performed poorly in all domains except governance (moderate) (<http://www.ncdglobalscorecard.org/bangladesh/>).

Table 4.3 | NCD Scorecard: high level results by income group

	Governance	Risk factors	Surveillance & research	Health system response	Respondents (N)
High-income countries	81%	48%	71%	94%	79
Chile	71%	48%	52%	87%	21
England	86%	60%	79%	88%	25
USA	88%	48%	79%	96%	12
Uruguay	57%	33%	40%	93%	21
Upper middle-income countries	52%	35%	38%	71%	225
Argentina	69%	46%	62%	71%	29
Belize	48%	20%	26%	67%	15
Brazil	52%	44%	48%	64%	27
China	67%	33%	64%	63%	41
Costa Rica	64%	44%	52%	83%	20
Dominican Republic	48%	37%	33%	62%	8
Mexico	64%	40%	48%	51%	23
Panama	57%	35%	38%	71%	9
Peru	57%	33%	29%	45%	15
South Africa	52%	28%	24%	75%	15
Tunisia	43%	22%	29%	66%	23
Lower middle-income countries	43%	20%	14%	22%	97
El Salvador	52%	19%	24%	38%	11
Guatemala	38%	22%	29%	9%	37
Honduras	29%	19%	19%	27%	10
India	57%	34%	26%	17%	12
Nicaragua	43%	18%	19%	51%	12
Pakistan	29%	17%	0%	21%	15
Low income countries	48%	32%	21%	25%	28
Bangladesh	52%	29%	24%	24%	20
Kenya	50%	32%	29%	19%	8
Total					429

Source: <http://www.ncdglobalscorecard.org/>

Key:

- ≤20 (very low performance)
- 41-60 (moderate performance)
- 61-80 (high performance)
- >80 (very high performance)
- 21-40 (low performance)

COBRA-BPS

The COBRA-BPS, a three-year multi-country project, was launched in 2016 and funded by the Wellcome Trust and UK-MRC to DUKE-NUS (icddr, b, 2015). The collaborating partners in Bangladesh are icddr, b (NCD initiative under the Health Systems and Population Division) and the GoB (DGHS). This randomized controlled trial (RCT) project aims to investigate integrated primary care strategies to control hypertension. A varying combinations of 1) home health education by trained CHWs, 2) trained government primary health centre mid-level providers led care, and 3) trained private practitioners were tested to see which combination was the most effective in lowering blood pressure among adults with hypertension in rural communities. In addition, the full-scale study also has a cost-effectiveness component. The initial works have been done including the baseline survey. The project is ongoing.

Bangladesh Diabetic Samiti (BADAS) (previously Diabetic Association of Bangladesh)

BADAS, a dedicated non-profit organization in private sector, implements multifaceted services to provide care to diabetic patients, especially the poor. It provides free services and medicines, health education on diabetes and its management (using posters, leaflets, flip charts, and training tools), and general and specialized clinical services, diagnostics and surgical intervention as and when needed.

Changing Diabetes in Children (CDiC) Programme

Launched in 2010 at BIRDEM Dhaka, CDiC programme is a joint initiative of BADAS, Novo Nordisk, and World Diabetes Federation (WDF). The overall goal of the project is to increase access to diabetes care for children with type 1 diabetes and provide free, comprehensive and sustainable healthcare through an integrated approach and team work which includes paediatric diabetologist, diabetes educators, psychologist, nutritionist and others. Being financed by Novo Nordisk, CDiC provides free insulin for children enrolled in the programme. Dedicated clinics are established in Dhaka, Chittagong and Faridpur. Care is provided through clinic service, education, psychosocial screening and counselling, yearly review, and complication screening to improve the glycemic control and quality of lives.

Life for A Child (LFAC) Programme

Life for a child (LFAC) programme in Bangladesh is a joint initiative of BADAS and International Diabetes Federation. It is an innovative and sustainable support programme in which individuals, families and organizations contribute monetary or in-kind donations to help children with diabetes in developing countries. It aims to provide the best possible healthcare to all young people with diabetes in developing countries, through strengthening of paediatric diabetes services in these countries. In 2015, there were 2,200 registered patients (aged 1-23

years) in Bangladesh, with a slight preponderance of females over males. In addition, BADAS has taken two innovative programmes funded by WDF for better prevention and management of gestational diabetes in Bangladesh (BADAS, 2011).

NCD SERVICES PROVIDED THROUGH FOR-PROFIT PRIVATE ORGANIZATIONS

In recent years, there has been a tremendous development of private sector to provide specialized services for almost all diseases including NCDs. The hospitals like Apollo, Lab Aid, Square and United could establish a corporate culture in health sector. Although they cater services to the rich, they could prevent a lot of people from going abroad for treatment. These hospitals should extend services to patients from nearby areas with emergencies as a part of their corporate social responsibility. It has been reported in media that they did not receive patients of road traffic injuries even with a life-threatening situation.

Available services for management of cancer.

It is estimated that there are 1.3 to 1.5 million cancer patients in the country and about 200,000 new patients are diagnosed annually and 150,000 die of the disease (MoHFW, 2008). Cancer registry report from the NICRH revealed lung cancer to be most common among males while breast and cervix cancer to be most common among females (Table 4.4). It

also revealed that >66% of the cancers occur in the age group 30-65 years. Such data disclose the impact of cancer as a major public health problem in the most economically productive age group (MoHFW, 2008)

GoB has a unique National Cancer Control Strategy and Plan of Action 2009-2015 which aims to provide a continuum of care through a comprehensive programme. Currently, most of the chemotherapy drugs required to treat cancer is available in the country, but there are problems with high cost of treatment, lack of adequate radiation facilities and trained health workforce (e.g., medical physicist), and lack of a national cancer registries (Uddin *et al.*, 2013 and Hussain, 2013).

Public sector facilities for cancer treatment and management

National Institute of Cancer Research and Hospital (NICRH)

NICRH is the only tertiary level cancer institute in Bangladesh with 150 beds and nine full-fledged OT facilities with other supports like post-operative ward, critical care unit (CCU) and central sterilization unit. According to 2008 hospital statistics, an average of five patients were admitted daily while an average of 44 OPD patients visited this hospital daily. Hospital death rate was 3.5% and bed occupancy was 95% (NICRH, 2009). This institution provides modern detection and treatment facilities including day-care and emergency services (like ICU), radiotherapy, psychotherapy, etc. for cancer patients. It also provides

specialized training facilities for nurses and paramedics for cancer patient management, run post-graduate courses and provide training facilities on cancer for doctors, and introduced and maintains hospital-based cancer registry. NICRH also conducts research, and organize public awareness campaigns for cancer prevention and control.

Bangabandhu Sheikh Mujib Medical University (BSMMU)

BSMMU offers two post-graduate courses on radiation oncology—one in medical oncology (MD in Medical Oncology) and another in surgical oncology (MS in Surgical Oncology). These courses are conducted by NICRH. The only palliative care centre under government management is functioning at BSMMU since 2007 with 18 beds in the inpatient department, in addition to outpatient, home care, and telephone care facilities. At present, this centre has started a national training programme in collaboration with Asia Pacific Hospice Palliative Care to disseminate the concept of palliative care throughout the country (Uddin *et al.*, 2013).

Private for-profit facilities for cancer treatment and management

Besides the government facilities, few private centres are also providing cancer care in Bangladesh. Among these, the Kumudini Hospital pioneered radiation treatment in the country. Another private centre named Delta Oncology Centre is the largest private cancer care centre in the country, having two linear accelerators, two cobalt and two brachytherapy machines (low dose and high dose rates) with 350-bed capacity. In addition, Square Hospital and United Hospital in Dhaka and KhwajaYunus Ali Medical College Hospital at Sirajganj in northern Bangladesh are also equipped with modern dual-energy linear accelerator. Few professional bodies like Oncology Club (Bangladesh Chapter of SAARC Federation of Oncologists), Cancer Society, Bangladesh Society of Radiation Oncologists, Gynae Oncology Society, etc., are also making significant contribution towards improvement of cancer care facilities in the country (Uddin *et al.*, 2013).

Table 4.4 | Top five malignancies based on sex attending NICRH in 2007

Men (%)	Women (%)	Both Sexes (%)
Lung (25.5%)	Lung (5.6%)	Lung (17.3%)
Lymphoma (7.4%)	Lymphoma (4.1%)	Lymphoma (6.0 %)
Esophagus (5.9%)	Esophagus (3.4%)	Esophagus (4.6%)
Larynx (5.4%)	Breast (25.6%)	Breast (12.3%)
Stomach (5.1%)	Cervix uteri (21.5%)	Cervix uteri (9.1%)

Source: Cancer Registry Report of the NICRH, 2005-2007

NGOs for cancer treatment and management

There are quite a number of small scale projects in the non-government sector which implement various innovative strategies to identify, treat and manage cancer in Bangladesh. Advanced Breast Cancer Identifying and Treating Project (Amader Gram, an ICT4D initiative) and Cancer Support Society (CANSUP) in Chittagong are working on breast self-examination and cervical cancer screening with technical assistance from WHO (CANSUP). Gonoshasthaya Kendra (GK) is in the process of establishing a cancer hospital for the poor adjacent to its Savar campus (GK). ASHIC Foundation is taking care of child cancer cases and raising public awareness for early detection, improved treatment, and social acceptance (ASHIC Foundation for children cancer) The 'Work for Better Bangladesh Trust' (WBB, 2013) works with government, MoHFW, developmental partners, and INGOs to control tobacco consumption and its indirect effects by advocating for smoke-free places, campaigning for tobacco control law and organizing workshops at divisional and national levels, etc. (Sujon, 2013).

Available services for management of Chronic Obstructive Pulmonary Diseases (COPD) including asthma

There has been a lack of population-based data on COPDs (chronic bronchitis and emphysema) in Bangladesh. In a study among people aged >40 years in Matlab conducted during 2011-2012, the prevalence of COPD was found to vary between

10 to 13% (GOLD standard and LLN standard respectively) using a hand-held spirometer (Alam *et al.*, 2015). Prevalence of COPD was found to be higher among males than females, and higher among rural than urban residents. Another population-based study in Dhaka City in 2009 found the prevalence of COPD to be 11% using spirometer among people aged ≥35 years.

Bangladesh has no complete, specific or defined national guidelines on COPD management. Consequently, it is lagging behind in COPD treatment. There is one tertiary level hospital in the public sector which specializes in respiratory diseases, viz National Institute of Diseases of the Chest and Hospital (NIDCH). It is the only institute in Bangladesh that extends modern specialized medical and surgical treatment to complicated chest and TB patients, and also offers training of medical manpower in the specialization of tuberculosis and chest diseases.

Public-Private Partnership (PPP) for tackling NCDs

One weapon in the health sector's arsenal against NCDs is the organization of activities under the Public Private Partnerships (PPPs). PPP paradigm first emerged in the mid-1990s, and a partnership between the private and public sector enabled joint provision of clinical goods and services to a mass population at a low cost. "PPP is a win-win relationship between the government and various private sector players for the purpose of delivering a service by sharing

the risks and rewards of the venture under a contractual obligation” (Asia Foundation, 2010). Many countries, including Bangladesh, now acknowledge the role of the private sector in fighting complex health challenges and are incorporating PPPs in their development discourse (MoF, 2010).

In countries that have implemented PPP in health sector, mixed results have been observed (Barlow, Roehrich, and Wright, 2013 and Asia Foundation, 2010). While it has some advantages such as provisioning large capital investment, augment resources- funds, technology, HR, project delivery on time and on budget, opportunity to regulate & accountability etc., it has some disadvantages as well. These include higher capital and transaction, monitoring and set up costs, lack of integration between clinical models and infrastructure design, partner management of banks, suppliers, and consultants over a long period of time etc.

Currently, there are two projects under this modality, e.g., building two hemodialysis centres at the Chittagong Medical College Hospital and National Institute of Kidney Diseases and Urology (NIKDU) respectively. It is true that PPPs are not a panacea for NCD epidemic, but, they are important in broader health care service provisions. With the enforcement of most enabling policy frame work and infrastructural environment, adequate financing and skills training, PPPs can help address health inequalities between low and high income groups and aid in the ongoing struggle with NCDs.

CONCLUSION

Primary prevention of NCD risk factors will be crucial, but the government has not yet adopted a comprehensive prevention strategy as a priority, which is a weak point in the NCD strategic plan. It is important that the NCDC Program of the DGHS pay a closer attention while developing an operational plan under the new multisectoral plan (2016-2021) (GoB, 2015) for prevention of NCDs targeting the most vulnerable people at risk. As of now, PHC facilities provide little information or awareness on chronic diseases, and there is dearth of NCD medicines and relevant diagnostic products for screening the NCDs. NCD treatment is provided only in tertiary care facilities, which are typically concentrated in urban areas. This creates a rural-urban divide in terms of access to tertiary level NCD treatment and care. In order to achieve universal health coverage, Bangladesh needs to integrate NCD prevention, curative and rehabilitative services at different strata of the health systems, and begin provision of NCD services up to the PHC level. NCD prevention and control will require long-term investment and longstanding implementation through a multisectoral approach involving non-health agencies; hence can be very expensive. A holistic approach should be adopted by the government for improving coverage of NCD services with quality of care at all levels, and reduce one-third premature mortality from NCDs to meet the sustainable development goal 3 by 2030.



CHAPTER FIVE

CURRENT HEALTH SYSTEM SCENARIO FOR ADDRESSING NON-COMMUNICABLE DISEASES IN BANGLADESH

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SUMMARY

Major share of current NCD care in the country originates in the public sector. At the primary care level of the public sector, NCD corners have been established at 300 upazilla health complexes which are mostly ill-equipped and goes against integrated service delivery approach. At the secondary level, NCDs services are provided as part of general services and there is less focus on preventive services. At the tertiary level, specialized institutes provide specialized NCD services without any collaborative network downwards. In the non-state sector, the NGOs, institutes, for-profit hospitals and public-private partnership ventures provide NCD services, mainly in the urban areas. In addition to existing infrastructural, fiscal and logistical gaps, there is also shortage of trained workforce for providing quality NCD services. Despite the excellent progress in national data platform; utilization of data for evidence – based policy making to control and prevent NCD is still a long way to go. At the same time, health literacy on NCDs is in its infancy in Bangladesh. NCD prevention and control requires strong national stewardship with multi-sectoral coordination. Equipping the health care centres with basic NCD medicines, equipment's, skilled workforce and a functional referral system is necessary with commitment at the highest level to address the emerging NCD epidemic in the country.

INTRODUCTION

Healthcare services for non-communicable diseases (NCD) in Bangladesh are provided from both the public and the non-state sectors. The current health system infrastructure in these two sectors, with relevance to the NCDs, is described in this chapter. The public sector provides comprehensive services at all levels (from primary to tertiary), but the non-state sector is predominant at tertiary care level. The review has identified capacity gaps in preparation for addressing the emerging burden of NCDs, and measures needed to overcome this.

PUBLIC SECTOR

In the public sector, the responsible ministry (the Ministry Of Health and Family Welfare or MoHFW) has two executing wings – the Directorate General of Health Services (DGHS) and the Directorate General of Family Planning (DGFP). These two wings are led by their respective director generals (DG), supported by additional DGs, line directors, and hospital directors. Both directorates have separate management and delivery structures from national down to union/ward levels (Ahmed *et al.*, 2015). In the public sector, healthcare services are provided from three different tiers – primary, secondary and tertiary levels (MoHFW, 2015). Although the structure and function of the health system in Bangladesh are pluralistic (Ahmed *et al.*, 2015), the NCD services are predominantly provided by the public sector through the focal ministry (El-Saharty *et al.*,

2013). However, it is still inadequately organized with poor fiscal and human resources, not so good governance, highly centralized service delivery models, and absence of comprehensive nationwide surveillance system (Islam and Biswas, 2014).

Primary care level

The primary level health care services are provided through an extensive network of health facilities and contain three tiers. These are the community clinics (closest to communities), the union health and family welfare centres/Union sub-centres (at the union level), and the upazila health complexes (at the upazila/sub-district level) (MoHFW, 2016). From community to upazila levels, the upward referral linkages are supposed to be in place, these three in turn linked to the districts hospitals (secondary level) (MoHFW, 2015). The NCD services available at these three tiers of primary care are at an early stage (Bleich *et al.*, 2011), as can be seen from the discussion in Chapter 4. Although there are some preventive services like awareness building and health education programmes related to lifestyle change available at the community level, there is the problem of referral linkage, and availability of diagnostics, even at the upazila level. It is worth noting here that tobacco consumption and high dietary salt intake (Zaman *et al.*, 2016) in Bangladesh are two important modifiable risk factors in which community clinic can contribute largely. Additionally, WHO PEN (WHO, 2010) screening services piloted in Bangladesh can be useful to

inform how to reduce the NCD gaps in primary care (Zaman *et al.*, 2016).

At the union and upazila levels where the doctors are posted, NCD services are not systematically offered, nor the other workforce are trained in diagnosis and management (Zaman, *et al.*, 2016). Of late, dedicated NCD corners have been established at the outpatient departments of around 300 upazila health complexes. In these corners, a doctor-nurse team is supposed to make initial assessment of the suspected cases referred from different OPDs and to take necessary measures for diagnosis and management including referral to higher facilities if needed. However, these corners are mostly ill-equipped both in terms of human resource and physical resources, and largely remain dysfunctional. Furthermore, the establishment of NCD corners goes against long cherished integrated service delivery ('NCD corners have 'cornered' the NCD services').

Currently, about one-fourth of the Bangladeshi people live in urban areas. Therefore, primary healthcare in urban areas also needs special attention. Rather it remained more neglected than described above. Cities glitter with tertiary level high-end hospitals from which simple services such as blood pressure and glucose measurements cannot be obtained without a day's wage loss. One has to wait in queue for a whole day for getting such measurements free of charge. In turn they become costlier than paid services. Thousands of primary healthcare facilities are needed to cater the services to the people

living in cities and big towns. The roles assigned to a single ministry (local government) have long been debated considering inadequacy of services. There are schools of thought that urban primary healthcare should be a shared responsibility of two ministries -local government and health.

Secondary care level

The district hospitals (Zila Sadar hospital) are usually concerned with the provision of diagnostic and curative services. These have core health workforce for providing healthcare services and laboratory services (MoHFW, 2015). Limited NCD services are provided at this level as part of general services such as the services provided by specialists on internal medicine. Other specialized units, such as cardiology, also provide specialized NCD services. There is no standard practice for referral system. Therefore, patients mostly follow self-referral according to their choice and ability. NCD preventive services are less focused (if at all), and essential service package is inadequate to address the NCDs, and registry system is also incomplete (El-Saharty *et al.*, 2013). District hospitals should facilitate development of referral and back referral system within the district. A district epidemiologist is needed to deal with the issues of evidence generation from health facilities and community level and to develop locally appropriate intervention models integrated with other successful health programmes in the district.

Tertiary care level

In the tertiary level, healthcare services are provided through medical college hospitals, specialized hospitals and institutes which are largely concentrated in the big cities and urban areas (Alam *et al.*, 2013). In the medical college hospitals, NCD services are provided from the respective specialized departments as in-and out patient services. The only medical university in the country (BSMMU) provides secondary and tertiary NCD care. Some specialized institutes like National Institute of Cardiovascular Diseases (NICVD), National Institute of Diseases of the Chest and Hospital (NIDCH), National Institute of Neurosciences and Hospital (NINS), National Centre for Control of Rheumatic Fever and Heart Diseases (NCCRFHD), National Institute of Traumatology and Orthopaedic Rehabilitation (NITOR), National Institute of Cancer Research and Hospital (NICRH), National Institute of Kidney Disease and Urology (NIKD&U), and National Institute of Mental Health (NIMH) provide mainly specialized NCD clinical services. However, patients admitted to these academic hospitals for diagnosis and treatment may suffer from inadequate and delayed services due to high patient load.

Lack of adequately trained (especially public health perspectives) doctors, nurses and diagnosticians to address NCDs is a constraint in public tertiary facilities. Although the biochemical investigations required for accurate diagnosis are available on a fee-for-service basis, certain sections of the

population have difficulty in accessing these services due to geographical factors, even when services are offered at a minimum charge (Alam *et al.*, 2013). There is a provision of registry system at this level but these are not well documented. Limited facilities are available for the rehabilitation of certain NCDs. There is no standard referral system. Therefore, patients are left to self-referral. A system of back referral to lower level hospitals probably could reduce excess workload of these hospitals.

NCD SERVICES PROVIDED BY THE NON-STATE SECTOR

In the non-state sector, hospitals led by professional societies, foundations, and NGOs provide preventative and curative services on NCDs, and also in collaboration with the public sector under public-private partnership (PPP) model (Chapter 4).

Fighting the tobacco menace

Some NGOs like Work for Better Bangladesh Trust (coordinates a big network of NGOs – Bangladesh Anti-Tobacco Alliance), Adhunik ('Amra Dhumpan Nibaron Kori' meaning we prevent tobacco smoking), Eminence, Manash, Progga, etc. work for building awareness on the health effects of tobacco products, and other NCD risk factors. One grassroots level community organization (Ekhlaspur Center of Health) has provided a few best practice examples of tobacco and hypertension control (Ahmed *et al.*, 2016 and Zaman *et al.*, 2016). It has shown that smoke-free homes can

be facilitated by involving schools (Ahmed *et al.*, 2016) and tobacco cessation can effectively be done through simple counselling at the hypertension clinics (Zaman *et al.*, 2016). Similar counselling can also bring down dietary salt consumption and these best practices can be replicated in all community clinics.

ADDRESSING THE EMERGING NCD EPIDEMIC: HEALTH SYSTEM PREPAREDNESS

In this section, the challenges before the current health systems regarding the management of NCD epidemic are discussed with special focus on the health workforce, ICT for NCDs, access to essential technologies and medicines for treating NCDs, and financing for tackling the NCDs.

Health workforces

In addition to the existing in frastructural, fiscal and logistical gaps there is deficiency of skilled human resource. Beyond the skill mix, a substantial number of posts often remain vacant. Unauthorized absenteeism, especially of doctors, in remote areas and governance in general has come to the centre point of discussion. The DGHS has started organizing video conference connecting the district and divisional health authorities every day. Management is gradually becoming digital. Therefore, it is expected that overall management, human resource management in particular, will improve in the coming days.

Integration of a comprehensive and cost-effective approach to deal with the NCD prevention, early detection and management can gain a momentum through this initiative.

The ongoing increase in burden of the NCDs has already over-stretched the health systems of Bangladesh. Sufficient numbers of motivated and responsive health workforce, with a wide variety of skills, are required to overcome the current NCD crisis. Bangladesh has been identified as one of the countries with severe health workforce shortages (Ahmed *et al.*, 2011). There is deficiency of trained personnel for providing NCD care at all levels of the service delivery (Alam *et al.*, 2013). Even within this insufficient manpower better results could be achieved by revising the duties of the health assistants. There could be a shift of their focus from communicable disease to NCDs. The workload related to the communicable diseases has been decreasing to some extent because many of them are already controlled or nearly eliminated. These skilled health assistants have proved to be one of the pillars of recent MDG achievements in health sector. Therefore, their optimum use towards NCD control should come under a policy shift concurrent to the ongoing epidemiological transition.

Basically, chronic care models emphasize the importance of primary health workers within the overall mix of different professional groups who are close to the community and can thus play a key role in prevention, screening, and supporting long-term

home-based care (WHO, 2011). To perform these tasks, there is a large pool community healthcare providers in addition to the health assistants. There are around 13,500 functional community clinics out of 18,000 all over the Country. However, their community healthcare providers are not sufficiently trained for providing preventive and screening services close to community (Zaman *et al.*, 2016 and Naheed, 2014). There have been a few sporadic efforts to build their capacity by DGHS with support from WHO and some non-state actors. There have been efforts under the sector programme also but more is needed to NCD agenda.

Human resource at professional level also deserves special attention. NCDC of DGHS run short course training and orientations of doctors, nurses and other paramedics using manuals developed with WHO support. Several institutes also run similar training courses. Besides, they (the institutes) in the public and non-state sectors also offer specialized degree/diploma courses related to NCDs (Table 5.1). Producing quality manpower by the institutes should be a continuous process to meet the challenges of NCDs.

Table 5.1 | List of institutes that run NCD related courses*

Institutes	Courses/Programmes
A. Public sector	
1. Bangabandhu Sheikh Mujib Medical University	MD, MS, MPhil in relevant fields, MPH covering an NCD module
2. Bangladesh College of Physicians and Surgeons	Membership, Fellowship in relevant subjects
3. National Institute of Preventive and Social Medicine	MPH covering NCD module; MPH (NCD) introduced in 2017
4. National Institute of Cardiovascular Diseases	MD, MS, D Card.
5. National Institute of Diseases of Chest & Hospital	MD, MS, DTCD
6. National Heart Foundation Hospital and Research Institute	MD, MS, Dip Cardiac Nursing, Dip Cardiac Technology
7. National Institute of Cancer Research and Hospital	MD, MS
8. National Institute of Kidney Disease and Urology	MD, MS

Institutes	Courses/Programmes
B. Non-state sector	
9. Bangladesh Institute of Research and Rehabilitation in Diabetes Endocrine and Metabolic Disorders (BIRDEM)	MPhil Endocrinology CCD
10. Bangladesh University of Health Sciences	MPH (NCD)
11. American International University Bangladesh	MPH (covering an NCD module)
12. BRAC University	
13. Daffodil International University	
14. North South University	
15. Varendra University	
16. National Institute of Neuroscience and Hospital	MD, MS

*Information has taken from website and personal contact

Information system for health

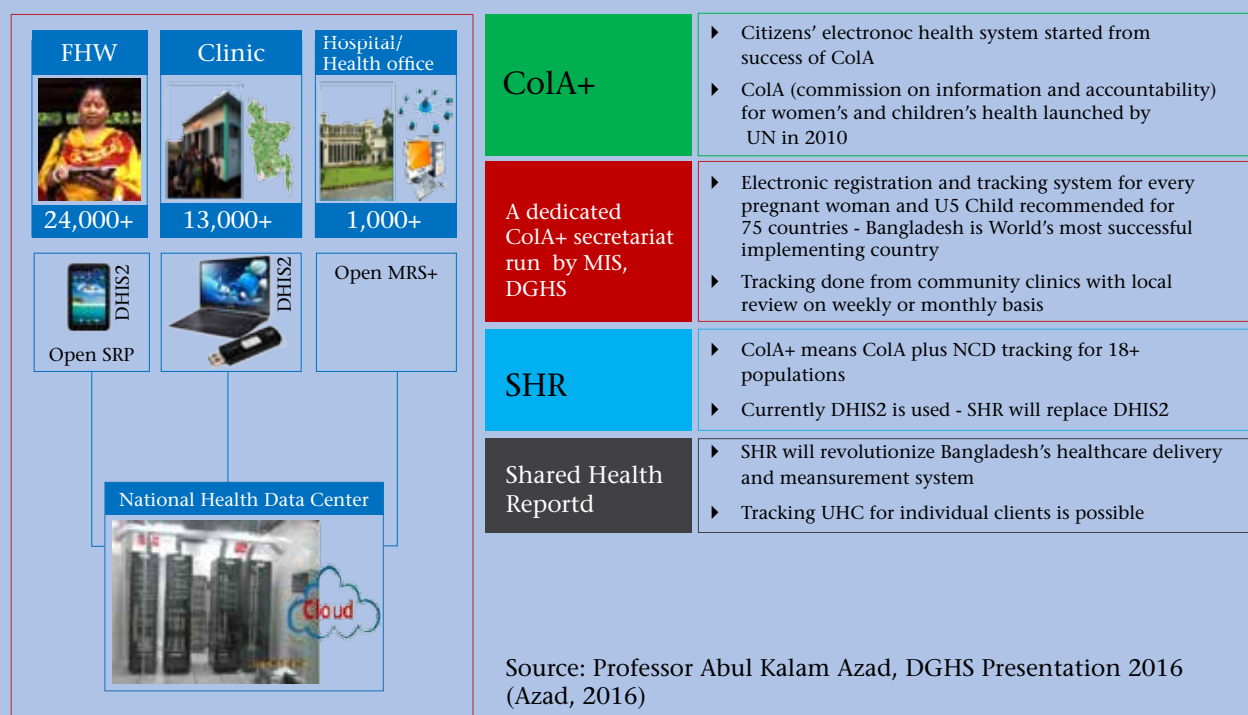
a. Evidence for health

Currently, Bangladesh has an excellent digital connectivity in the public sector, linking all levels of service delivery for real time data under a national data platform known as DHIS2 since 2009 (Azad, 2016). In this platform, along with the other diseases, NCD-related data are collected from the public sector health facilities beginning from community clinics up to district hospitals. These data have values for public sector's health systems performance. However, this database cannot provide a comprehensive picture of the country as a whole because DHIS2 does not cover non-state sectors and the urban segment of population at large. Additionally, these data are numerators of the diseases having no population

denominator. Therefore, disease burden at population level cannot be determined, which is very much needed for addressing sustainable development goals (UN, 2016) and global NCD monitoring framework indicators (WHO, 2013).

The well-known Commission on Information and Accountability (CoIA) with the collaboration of Ministry of Health and Family Welfare (MoHFW) has extended its programme with two focuses - Maternal, neonatal and child health (MNCH) and NCDs. From July 2015, icddr,b has taken over the responsibilities of CoIA Secretariat (MoHFW, 2015). A flowchart of information under DHIS2 is given below:

Digital connectivity in health sector, Bangladesh



The Institute of Epidemiology, Disease Control and Research (IEDCR) has been implementing the Behavioural Risk Factor Surveillance System on a pilot basis (IEDCR, 2012). It collects information on health conditions and risk behaviours contributing to NCDs, including injuries and preventable communicable diseases. This is a computerized mobile phone-based surveillance system which was established with technical support from the Centres for Disease Control and Prevention, Atlanta, and financial assistance from the International Association of National Public Health Institutes. Recently, the Cancer Institute has taken the initiative for a cancer registry. NIPSOM, in collaboration with Bangladesh Bureau of Statistics, conducted Global Adult Tobacco Survey (GATS) in 2009 with

support from WHO and CDC, Atlanta (WHO, 2009). Bangladesh Society of Medicine conducted a survey on NCD risk factors in 2010 according to WHO STEPS with technical support from WHO (Zaman *et al.*, 2016). Bureau of Health Education has reported NCD risk factor distribution in Bangladeshi adult population under its model health promoting jurisdictions (Zaman *et al.*, 2015). National Centre for Control of Rheumatic Fever & Heart Disease (NCCRFHD) has conducted Global School-based Students Health Survey (GSHS) in 2014. Its report will be published shortly. All these surveys contain nationally representative data on NCD risk factors in youths and adults of Bangladesh. Currently Bangladesh Bureau of Statistics and NIPSOM is preparing for conducting the second round of GATS and STEPS,

respectively. Integrating all data from different sources into a coherent common platform, so that these can be used for surveillance, monitoring, evaluation and research for decision-making, still remains a far cry.

In addition to the periodic surveys mentioned above, government's own system should generate data out of its own resources. For example, health and morbidity survey of BBS should expand its focus to NCDs, DHS could provide tobacco data (considering its target age group), and health facility survey could elaborate NCD issues relevant to global NCD monitoring framework. Sample Vital Registration Survey (SVRS) has been taken up with highest level of priority by the government. Therefore, representative and correct data on mortality is expected from SVRS.

Hospital based cancer registry started officially from January 01, 2005 at the National Institute of Cancer Research & Hospital (NICRH), Mohakhali, Dhaka. So far two reports for 2005 and 2005 – '7 were published with support from WHO, and another report for 2008 – '10 with support from a pharmaceutical company. The current report for 2014 is available in the DGHS website (DGHS 2015). There is a need of establishing a population-based cancer registry to provide prevalence and incidence estimates.

The use of research findings into practice is still at an early stage in Bangladesh. Evidence-based decision-making should accelerate in the coming years with growing momentum of NCD prevention and control in the country. Bangladesh Center for

Communication Programme has been supporting research on tobacco with technical assistance from the Johns Hopkins Bloomberg School of Public Health.

b. Health literacy

The above discussion is on collection and utilization of data. In this case both supplier and consumer of data are primarily health sector or related people. However, there should be information flow to the people, for whom the health system is paid by the public treasury, for protecting their health by themselves. That is where the issue of 'health literacy' comes. 'Healthy People 2010' – a report published by the US Department of Health and Human Services– defined health literacy as “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions” (U.S. Department of Health and Human Services, 2000). Health literacy on NCDs is in its infancy in Bangladesh. Messages on NCD prevention are sporadically visible in health facilities especially the posters printed on the occasion of observing various days. Bureau of Health Education ran a campaign under its model village initiative with WHO support and also under its sector programme. The awareness package included, among others, dietary salt and tobacco. NCD corners are set up in selected health facilities which are supposed to disseminate information on NCDs. However, the NCD corners either do not find appropriate space in the hospitals, which is already

overcrowded, or do not have adequate manpower to facilitate health literacy. Use of mass media for NCD health information is patchy. Anti-tobacco campaigns are sporadically taken up with support from The Union, Vital Strategy and WHO. Journalists are given award by Progga (with support from Campaign for Tobacco Free Kids) for publishing feature reports in newspaper or televising reports promoting health literacy. Recent introduction of pictorial warning on the tobacco packs have created substantial public awareness against tobacco. According to preliminary findings of a recent survey conducted by NIPSOM with WHO support, the newspaper ads published by MoHFW on the graphical health warnings had created high level of public awareness against tobacco. It is well-known that for an additive substance like tobacco the coordinated and strategic campaign should go continuously adopting a social marketing approach.

Over the years, there had been substantial advocacy activities particularly targeting policy-makers in health sector, academia and health institutions especially focusing tobacco. This has enabled the MoHFW to amend the Tobacco Control Act in 2013 (National Tobacco Control Cell, 2014). Health system could mobilize other ministries to take up NCDs into their agenda as has been done by the Ministry of Food by enacting and implementing (although sparingly) The Food Safety Act (GoB, 2013). The whole 'government approach' is yet to realize the full potential and more focus is needed to educate non-health

sectors in their role in generating positive health outcome.

There are opposing forces, at times in disguise, to health literacy and ultimately to health promotion. Tobacco industry still lures young people projecting tobacco in an attractive and heroic manner. Tobacco taxation in the fiscal budget is always opposed by the industry to keep tobacco products most affordable so that the industry profits are not affected. Junk food and drinks very often provide misleading advertisements and false claims of health and wellbeing. These happen in the national mass media although the government has commitment to prevent these to protect health of its citizens. Engagement of relevant non-health sectors only can prevent these kinds of activities.

ACCESS TO ESSENTIAL MEDICINES AND TECHNOLOGIES

Bangladesh has a national drug policy and a list of essential drugs for use in the public health system. Generic drugs comprise the bulk of the items on the list. A few drugs for treating NCDs have been included recently in the essential drugs list with technical assistance from WHO (WHO, 2015). Additionally, WHO's Package for Essential NCD (PEN) provides drug list for low resource settings which is yet to be field-tested in Bangladesh (WHO, 2010). A recent report indicates a severe shortage of these drugs in the primary healthcare facilities (Zaman *et al.*, 2016).

Tertiary level hospitals are capable of doing all essential investigations required for NCDs. These hospitals have skilled people to do the tests. All reagents are supposed to be available. Unfortunately patients are advised to get the investigations done from private for-profit diagnostic centres. This leads to a large out-of-pocket expenditure of the patients, many of who are poor. It needs research - "Why doctors are sending patients out of hospitals for investigations?" Either they (doctors) do not have confidence on the quality of the report or timely delivery of reports, or there is an unholy nexus working behind this. This has to be stooped any way by adopting various means: supplying appropriate equipment (if required) and reagents, doing better maintenance of equipment; providing effective information to the service-seekers, and motivating doctors (and other service providers) not to send patients out for no reason.

Hospitals at secondary level are also capable of providing limited diagnostic services. More attention may be necessary to ensure that all listed tests are done there. However, it is frequently reported in the media that machines (such as X-Ray machine) remain out of order or chemical/reagents are not available or there is no manpower to run the machine. Governance issue warrants attention. At primary care level the situation is even worse. Technologists are either not there or insufficiently provided or they are not working properly. All health complexes (and facilities below them) need simple equipment such as an X-ray machine with films,

a colorimeter with reagents, ECG machine with papers, nebulizers with respirator fluid, glucometers with strips, weighing scales, sphygmomanometers, stethoscopes, etc. These are inadequate there (Zaman *et al.*, 2016). Such machines for the whole country could be purchased using money spent for highly expensive equipment bought for several hospitals but were not installed for years.

FINANCING

There are primarily three sources of financing for health services in Bangladesh: government, out-of-pocket payments (OOP) by households, and external sources by development partners. The country has one of the lowest government spending on health in the world at less than 1% of GDP (Ahmed *et al.*, 2015). The main source of finance for total health expenditure is OOP by households (63.3%), followed by government spending (26%), and external resource (8%) (MoHFW, 2015 and HEU, 2012).

While basic healthcare is a right stipulated in the Bangladesh Constitution, and essential services are supposed to be provided free of cost, patients have to make informal payments to access the services. These include extra costs on diagnostics and medicines including under-the-table payments to providers at times (as reported in media). Some forego care and use informal providers or use self-medication. About 60% of the out-of-pocket expenditure is

spent on drugs directly bought from pharmacies, diagnostics and informal providers (MoHFW, 2015). Using the Health and Morbidity Status Survey (HMSS) 2012 and Household Income and Expenditure Survey (HIES) 2010, an analysis was conducted to determine the impact of chronic illness to catastrophic spending and impoverishment. The findings show that chronic illness can cause large out-of-pocket payments (more than double) relative to other type of diseases. The proportion of catastrophic spending for chronic diseases is highest among those from lowest quintiles at 14% compared to 6.6% among the richest (Fig. 5.1) (BBS, 2013). Among the chronic illnesses, cancer has the highest average out of pocket payment followed by epilepsy, diabetes, high blood pressure and arthritis.

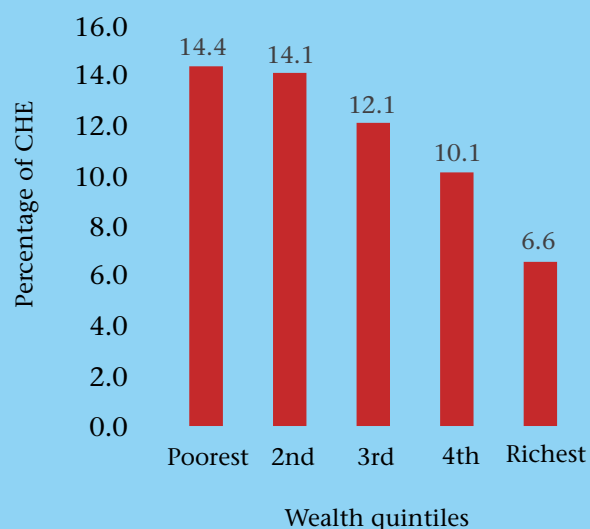


Fig 5.1 | Proportion of catastrophic health expenditure due to chronic illness, 2010

Source: Ahmed, S. calculation using HMSS 2012 (BBS, 2013)

CONCLUSIONS

Key challenges and how to overcome

Health service delivery for NCDs is less focused on preventive care at primary and secondary levels. There is no standard operating procedure for referrals. Even the essential package of health services does not address NCDs in a focused manner. Therefore, the NCD prevention and control require strong national stewardship of the MoHFW to coordinate a meaningful multi-sectoral response. Raising priority for NCD issues in other ministries needs further attention. Additionally, equipping PHC facilities with skilled health workforce, basic NCD

medicines, necessary instruments, and implementation of a referral system require commitment at the highest level and incremental investment in the health sector.

PPP models may be leveraged in franchising the capacity building efforts for NCD prevention and management as a short-term measure. A comprehensive national surveillance system integrating all available databases using a common platform for monitoring NCD risk factors and disease burden, a registry system for cancer at PHC level and above, and use of evidence for making decisions are the call of the day.





CHAPTER SIX

SUMMARY AND RECOMMENDATIONS

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SIFAT SHAHANA YUSUF

Non-communicable diseases (NCD) constitute a major challenge for the 21st century, especially the low- and middle-income countries (WHO, 2014). Globally, the NCDs are receiving increasing attention from the policy-makers and practitioners, as reflected in the new 3.4 Sustainable Development Goals (SDG) target (“reduce mortality from NCDs and promote mental health”) (UN, 2015). Bangladesh is also at a ‘cross road’. It is currently undergoing a demographic transition towards a relatively ageing population (population ≥ 60 years projected to be 18.8% by 2050), thanks to the declining fertility and increased life expectancy over the decades since independence. It made laudable progress in achieving health-related MDGs (Millennium Development Goals) related to maternal and child

survival resulting from improved access to health, nutrition and family planning services (GED, 2015). Beside supply side activities, ‘consistent and coordinated policy and programme inputs across health and other sectors’ played its part in achieving these targets (Ahmed *et al.*, 2016).

Currently in Bangladesh, the communicable diseases are not yet fully controlled, but there is a simultaneous rise of NCDs accounting for >60% of total annual mortality (MoHFW, 2016). Due to demographic transition, the age group 15 – 59 years now constitutes 61% of the population, the ‘mid-age’ bulge which is also the period of life when NCDs usually set in. Combined with the yet-to-be controlled communicable diseases, the Bangladeshi population now face the ‘double burden’ of

diseases. This has thrown up a challenge to the existing as yet unprepared health system of the country which is characterised as “weak in terms of inadequate physical and human infrastructure and logistics, and low performing” (Ahmed *et al.*, 2013). The situation is compounded by health fallouts from rapid urbanisation with 35% of the population residing in urban areas (UN, 2008), climate change (Hasib and Chathoth, 2016), and road traffic accidents (Mahmud, 2014). Also, the pluralistic nature of Bangladesh’s health system means that beside public sector, there are other stakeholders in the informal, private and not-for-profit NGO (non-government organizations) sectors with different systems of therapeutics and modalities of operations, and are positioned to play important roles in providing NCD-related services (Ahmed *et al.*, 2015). Thus, this year’s Bangladesh Health Watch report has focused on this important topic to investigate and discusses the problems and prospects of articulating a comprehensive, integrated, nationwide NCD prevention and control strategy, and plan of action with way forward.

Four major NCDs are discussed in this report given their importance in terms of disease burden, common modifiable risk factors, and the feasibility of initiating lifestyle changes (e.g., tobacco consumption, unhealthy diet, inadequate physical activity and harmful use of alcohol) at the primary health care (PHC) level in a cost-effective manner. Each NCD is discussed around four central themes: current epidemiology and prevalence of risk factors, existing policies and

strategies including challenges of implementation, inventory of ongoing NCD programmes and finally, an assessment of the current health infrastructure preparedness vis-a-vis addressing the challenge of NCD management in the coming years. Due to constraints in time and resources, we could not go beyond secondary data for the descriptive analyses presented here. However, given the extensive literature review done covering grey literature, government and UN documents, published and unpublished materials, we hope this would be a pretty good snapshot of the current situation which can feed in the development of a comprehensive, integrated and people-centred NCD prevention and control programme for Bangladesh.

As evident from the inventory, quite a number of hospital and community-based NCD prevention and management programmes are currently ongoing in the public and private sectors, albeit, at a fragmented manner. While such activities are important to find out a practical model and are much needed, the extent to which these activities have produced any impact remains to be seen. Public-private partnership (PPP) for NCD prevention and management is advocated as it reduces capital cost and allows for adoption of new technologies, however, there is a need for supplementary legislation and law enforcement management for such models to succeed.

Apparently, Bangladesh has quite a number of national policies and strategies e.g., National Guidelines

for management of hypertension in Bangladesh (DGHS MoHFW, 2013), Guidelines for care of Type 2 diabetes mellitus in Bangladesh (BIRDEM, 2003), National Strategic Plan of Action for tobacco control 2007 – '10 (MoHFW, 2007), National Cancer Control Strategy and Plan of Action 2009 – '15 (DGHS MoHFW, 2008) etc. targeted towards specific NCDs. Besides, there are policies and strategies such as 'Multi-sectoral Action Plan for NCD Control and Prevention 2016 – '21' (GoB, 2015) and 'Strategic Plan for Surveillance and Prevention of NCDs in Bangladesh (2011 – '15)' (DGHS MoHFW, 2011) which discuss about a comprehensive approach to the problem. However, the problems with these policies are that these lack the "Big picture" and are ambiguous about the coordinated actions needed at the top level backed by political and financial commitments. As such, these miss the much needed inter-sectoral and inter-ministerial coordination to tackle the problem on a national scale.

CHALLENGES

The NCD management and prevention face a number of challenges that need to be addressed in order to improve the health system's response:

Mainstreaming NCD service provision at the PHC level: emphasizing prevention (based on modifiable risk factors and lifestyle change) over treatment

A number of gaps within the health systems have been identified that interferes with the mainstreaming

of NCD services in the existing infrastructure. Firstly, most programmes and interventions around NCDs are focused on curative management rather than prevention, especially at the secondary and tertiary level health facilities/hospitals. Given the risk factors associated with NCDs (i.e. lifestyle changes, smoking, rise in obesity, urbanization, climate change, etc.), it is important that primary level health facilities be appropriately equipped, both with trained health workforce and necessary equipment for screening and referral. This may prove challenging, however, for a health system which is currently geared to address the communicable diseases (mainly targeting mothers and children), and fraught with issues of quality, efficiencies and equity. Secondly, an updated list of essential medicines that take into account NCD conditions is yet to materialize. Besides, the provision of requisite instruments e.g., blood pressure measuring machine, glucometer, weight machine and measuring scale, etc. at the PHC level facilities is needed for assessing the prospective candidates for possible NCDs. Thirdly, fiscal resources allocated towards NCD prevention and management are yet to make a dent as major portion of the budget is allocated towards family planning, infectious diseases and maternal and child health. Additionally, the health workforce engaged in delivering PHC services currently lack skills around NCD prevention and management.

Absence of functional regulatory framework and lack of coordination at the national level

Prevention and control of the NCDs is not the sole purview of the health sector. As the factors contributing to the causation of the NCDs extend beyond health sector to sectors such as environment, urbanisation, urban planning, food and agriculture etc., so should be a central coordination of the sectors in place to allay harmful effects of the other sectors on health ('health in all' approach). In fact, the regulatory regime for checking harmful impact on health is largely ineffective in Bangladesh. There is no dearth of laws, but problem lies with the will or means to enforce these. Regulatory regime for control of tobacco consumption, environmental pollution (air, water, soil, chemical, etc.), food contamination, etc. including its enforcement is essential for prevention of NCDs at the population level. While a number of policies and programmes have been developed by both public and private organizations e.g., legislature for smoking in public places and display of graphical warning on cigarette packs, a tangible and accountable monitoring framework is yet to materialise. In addition, a number of government bodies including line ministries, directorate generals, and governing cells (e.g., National Tobacco Control Cell) appear to be involved in controlling some of the risk factors but it is unclear what level of overlap exists within these bodies, and the extent to which effective coordination occurs within and among the relevant ministries and

line directorates.

Lack of robust database at national level for NCD surveillance and monitoring, incorporating common data from rural and urban areas as well as public, for-profit and not-for profit, and other non-state sectors

For planning comprehensive and integrated strategies and activities to address NCDs, as well as monitoring to see its effectiveness, collection of routine surveillance data is essential. While there have been some attempts to develop such data bases in some specialized tertiary hospitals or upazila health facilities, these are mainly limited to public facilities. There have been minimal efforts to integrate private sector data into the existing datasets such as the national District Health Information System 2 (DHIS 2). Also, data from urban areas need to be integrated with the rural datasets. This requires planning, consensus on measurable indicators (for risk factors and diseases), capacity development, and mobilisation of financial resources. For implementing a nationwide, integrated NCD surveillance and monitoring system, it needs to be prioritized by the MoHFW with support and assistance from other ministries, non-state sectors, academia and practitioners.

RECOMMENDATIONS

Based on the findings and discussions above, the following recommendations are made:

Build awareness on the extent and importance of the NCDs for health and wellbeing at present and in near future, and its linkage to poverty alleviation and economic development; its importance for achieving universal health coverage (UHC) at the policy, practitioners, and community levels.

Consolidate current fragmented activities related to the NCDs in the public and non-state sectors under a national information, education and communication (IEC) strategy using different media such as audio-visual, print media and inter-personal communication. Plan to scale up what works. Capacity of the social leaders, religious leaders, and politicians to be developed so that they become advocates for i) adopting healthy lifestyles for preventing the NCDs, and ii) screening for early diagnosis and appropriate management. Community engagement and participation in the design and implementation phase is essential for building ownership of this IEC campaign and its ultimate effectiveness.

Develop an integrated, multi-sectoral approach to manage NCDs, with government at the helm

While a number of NCD-related policy documents, strategy plans and acts are available, these documents need scrutiny and analysis for identification of any gap for the development of a

more comprehensive action plan in alignment with SDG Goal 3, 7th key driving force of the ensuing HPNSIP 2016 – 2021 (MoHFW, 2016a), and the 7th Five-year Plan 2016 – 2021 (MoP, 2015). Besides, coordination of activities of different ministries/entities with a direct bearing on NCDs (e.g., finance, environment, urban planning, environment and climate change, transport, agriculture, etc.), a strong emphasis for including the private sector, civil societies, and other not-for-profit organizations is warranted for NCD service delivery under a PPP model. Examples of successful PPPs in health (e.g., DOTS, EPI, etc.) can be replicated in the case of NCDs e.g., non-state sector building awareness on NCDs and mobilising population for lifestyle changes, community-based screening and follow-up services, and public sector developing a functional referral system for diagnosis and treatment, and connecting the former entities with the district and tertiary level health facilities/hospitals/clinics.

For these to happen, the government should provide necessary leadership and mainstream NCD prevention and management in both public and private sectors. This is reflected in one of the ten key driving forces of the forthcoming HPNSIP 2016 – 2021: “tackling the rising burden of NCDs through cross-sectoral works to establish healthy lifestyles and healthy environment”, which emphasized the central role of public health in articulating healthy lifestyle (diet with plenty of vegetables and fruits, regular exercise, low salt and sugar intake, avoiding tobacco consumption, etc.)

and environmental changes (MoHFW, 2016a).

Strengthen the current health systems at all levels to address NCDs with a focus on developing physical and human capacity at the PHC level for delivering preventive services based upon common modifiable NCD risk factors; and screening for early diagnosis and treatment including long-term, follow-up services for identified cases.

As NCDs are on rise in Bangladesh, it is imperative that the government focus more efforts in developing the PHC facilities to provide population-based cost-effective services in prevention, screening, referral at higher level, and follow-up of chronic cases. For this, the health care providers at the PHC facilities need to be trained in managing NCDs including skills development in health promotion and health literacy activities. Facilities need to be equipped with relevant instruments for check-up. Allowing for an efficient drug supply and testing kits would help PHC facilities in the early detection and management of the

common NCDs, taking some pressure off the over-crowded secondary and tertiary level facilities. The forthcoming essential service package (ESP) (MoHFW, 2016b) 2016 under the HNPSIP should ideally supply drugs for the prevention and management of CVDs, hypertension, and diabetes at the primary level health care facilities. Additionally, the cost of diagnosis of the NCDs should be subsidized and the government should consider more PPPs to address the service delivery gaps towards achieving UHC.

Establish a comprehensive surveillance system and a registry for the four major NCDs at the national level.

Designing and implementing a sustainable model of surveillance for NCDs is the call of the day. The currently existing fragmented and disconnected databases in specific NCDs, DHIS 2 and other small scale datasets in the non-state sectors need to be consolidated and brought under a common platform. This common system should cover all sectors and all areas. Such a database would



allow policy-makers to access the information when needed, understand the trends of risk factors prevalence and disease burden, and thus allow for proper planning and development of community-based prevention and management programmes, and evaluations of programmes undertaken. For this to happen, political commitment and coordination at the highest level will be needed, under the stewardship of the MoHFW and involving all stakeholders. A common, interactive data platform with options for real-time uploading and retrieval of data, and sustainable financing for maintenance of the system will be needed. The government cannot afford to ignore the rising burden of NCDs. In the absence of evidence-based actions, the human capital, social and economic costs of NCDs will continue to grow and overwhelm the capacity of the country to address them.

Generate evidence for innovative measures to tackle NCDs within existing health infrastructure in an effective, efficient, and cost-effective manner, keeping equity and universal health coverage in focus

Research and evaluation is essential for generating evidence related to the functioning of the NCD related programmes and interventions ('what works best, and at what cost?'). For this, setting up a research agenda and prioritising research topics including identification of funding sources will be needed. The aim of such research would be how to optimally use the existing infrastructure effectively and efficiently, with a focus on equity and universal coverage. Innovative ways to deliver preventive and curative NCD services in a cost-effective manner, especially in the communities, and measures for scaling up successful experiences will help a lot in moving the health related SDGs forward.





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ANNEX ONE

SHORT BIOGRAPHIES OF AUTHORS AND CO-AUTHORS



Syed Masud Ahmed (<http://syedmasudahmed.blogspot.com>) is Professor and Director of the Centre of Excellence for Universal Health Coverage (www.coe-uhc.org), under James P. Grant School of Public Health, BRAC University. He coordinates health systems module in the School's flagship MPH course. Prof. Ahmed graduated from Dhaka Medical College in 1978 and earned PhD from Karolinska Institutet University, Sweden, in 2005. His research interests include studying the impact of microcredit-based development interventions on health and well-being of the poor; health equity and improving health system's ability to reach the poorest-of-the poor; human resources for health, informal sector providers, and universal health coverage; antimicrobial resistance, and health sector corruption.

Under the CoE-UHC, he is organising research, advocacy and capacity-building activities towards the advancement of UHC agenda in Bangladesh. He has experience of reviewing grants

proposals as member of the Programme Committee, Global Health Policy and Health Systems Research (GPHSR) of the NWO/WOTRO (2009 - 2013), and Wellcome Trust Joint Health Systems Research Committee (2013 – 2016). Prof. Ahmed has published extensively in peer reviewed Journals and authored book chapters, monographs and working papers. He has travelled extensively and participated in international seminars, conferences and workshops. He was also a peer reviewer for many renowned public health journals such as Bulletin of WHO, World Development, Social Science and Medicine, BMC Public Health, Malaria Journal etc. Dr. Ahmed can be reached at: ahmed.sm@bracu.ac.bd



Malabika Sarker is a Professor & Director Research of James P Grant School of Public Health (JPGSPH), BRAC University. Dr. Sarker also leads the Center of Excellence on the Implementation Science and Scale UP (SISU) at JPGSPH. Dr. Sarker is a physician with a Master's in Public Health (MPH) from Harvard University, USA and a Doctorate in Public Health from University of Heidelberg, Germany. She has been a Population Council Fellow and Fogarty Fellow at the University of Alabama, USA. Dr. Sarker worked as a Senior Lecturer at the Institute of Public Health (IPH), University of Heidelberg, Germany. She is an adjunct faculty at IPH and regularly teaches reproductive health and mixed method research. She has conducted research on prevention of mother to child transmission of HIV, and quality of maternal care in several Sub Saharan African countries. Her current scholarly interests include evaluation and implementation research in the areas of MNCH, Tuberculosis, communication for development and health care financing. She has published more than 40 articles in several international peer-reviewed journals (Lancet, BMJ, Plos One, Health Policy & Planning, BMC etc), authored three book chapters, and specializes in mixed-methods research. Dr. Sarker can be contacted at: malabika@bracu.ac.bd; malabikasarker@gmail.com.



Mohammad Didar Hossain is a public health researcher with primary background in Nutrition and graduation in Management and Public health. He has more than nine years of work experiences. Previously, he worked as a Clinical Research Coordinator (CRC) in Mumbai, India, conducted training courses on all aspects of induction to Clinical Research, Standard Operating Procedure (SOP), Management and Good Clinical Practices (GCP). He worked at International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) from 2011-2015. As a Research Investigator, he participated in numerous research projects, scientific writings and completed several training courses including advanced research methods. He is currently working in James P Grant School of Public Health, BRAC University, leading a number of projects and supervising PhD students. He has good track records of both qualitative and quantitative publication including systematic reviews in reputed international peer-reviewed journals.

His passion is to contribute integration of Non-communicable diseases (NCDs) and Mental Health services into primary health care through collaborative research. He coordinates and liaise with the Government of Bangladesh, scientists, renowned academic and research institutions for policy, planning, management, monitoring, and evaluation on mental health and NCDs. His ultimate career goal is to identify ways to establish and improve research and programs in Bangladesh through his academic background with great mix of qualification for the life time good health. Mohammad Didar Hossain can be reached at: ddrhossain@yahoo.com.



Lal B Rawal worked with icddr,b Bangladesh from 2013-2016, as Senior Associate. He was also an Adjunct Faculty at JPG School of Public Health, BRAC University, where he taught Health Systems Management for MPH program, and supervised students' MPH research projects. He has over 15 years of experience working as Health Systems Expert in Nepal and Bangladesh. He is currently based in Ghana, West Africa. He has led a number of health and related projects and consultancies and has published a number of papers in peer-reviewed inter (national) journals. His areas of expertise include Epidemiological studies; Implementation science research; Health policy and practice; Health systems strengthening; Universal health coverage and Non-communicable diseases (NCDs) prevention and management. Dr. Rawal earned his PhD from Monash University Australia, MPH from Mahidol University Thailand and MEd (Health Ed.) from Tribhuvan University Nepal. He can be contacted at: lbrawal@gmail.com



Dewan S Alam is a public health expert, an epidemiologist and a medical doctor. Currently, he is holding a visiting professor position in the Faculty of Health at York University, Toronto, Canada. Before moving to York, he worked as a Senior Fellow and Scientist at the Centre for Global Health Research (CGHR), at St. Michael Hospital in Toronto, Canada. He worked at International Centre for Diarrhoeal Disease Research, Bangladesh (icddr,b) for long time and served as the

Interim Director for the Centre for Control of Chronic Diseases (CCCD) and led the Non-communicable Disease (NCD) Unit as the Head before leaving icddr,b end of 2014. Dr. Alam received Fogarty International Centre (FIC) and National Institute of Health (NIH) grant for the Global Environmental and Occupational Health (GEO Health) as the Principal Investigator and currently involved in that project as an External Investigator. He led the Bangladesh Centre of Excellence (COE), at icddr,b an NIH and United Health supported Global Health Initiative to combat NCDs in Low- and Middle-income countries (LMICs) and also led many projects as principal investigator. Dr. Alam has over 40 articles published in reputed international peer-reviewed journals. Dr. Alam can be reached at: alamds@yorku.ca or dsalam09@gmail.com.



A M Zakir Hussain graduated from the Dhaka Medical College. He stood 10th in SSC and 19th in HSC examinations in Karachi board examinations. He served for about 1.5 years in upazila health complexes. In 1979 he completed MPH from NIPSOM and went to Japan for training on Medical Science & Technology. In 1988 he completed Ph.D. in Biomedical Sciences, majoring in Epidemiology & Biostatistics, with the best student award (Joseph E Alicata Award). He was awarded as the best student presenter in the Annual Conference of the Association for Microbiology, USA in 1987.

Dr. Hussain was a teacher of Community Medicine, and Epidemiology at NIPSOM. In 1994 he was posted as the Director of Primary Health Care & Disease Control, DGHS. Dr. Hussain was awarded

as the best Project Director in 1997, for the oft referred Thana Functional Improvement Pilot Project. He was one of the formulators of the HPSS and the HPSP in 1997 and 1988 respectively. He initiated the Integrated Management of Childhood Infection (IMCI) and HIV/AIDS control programs in Bangladesh. He was actively involved in developing the first Health Policy in 2000, HNPS 2003-2011, HPNSDP 2011-2016 (team leader). He was also a Director of IEDRC and Chief of Bureau of Health Education.

Dr. Hussain was the first Partnership Agreement Specialist and Team Leader of the first phase Urban Primary Health Care project (2000-2002). He joined the WHO regional office of South East Asia in 2003 and left government job in 2005. Dr. Hussain was the Managing Director of a local NGO, served ADB for a year and joined a Ministry of Health & Family Welfare consultancy in 2007. In 2008 and 2009 he worked in the WHO country office of Bangladesh and joined its regional office again as the Regional Advisor of Environmental Health & Climate Change in 2010, and retired from there in 2013. Since then has been working as a free lance consultant. He worked as an Advisor of the National Nutrition Services and is now the CEO of the Social Sector Management Foundation. He is also working on part-time basis for a European Union funded project for health and nutrition to the urban poor. Dr. Hussain can be reached at: amzakirhussain@hotmail.com



A H M Enayet Hussain obtained MBBS from the MAG Osmani Medical College & Hospital, FCPS (Ophthalmology) from the Bangladesh College of Physician & Surgeons and FRCS from the Royal College of Physician & Surgeons, Glasgow.

He is now the Additional Director General of Health Services. He was the Line Director of Non Communicable Disease Control, Directorate General of Health Services, Dhaka. Before this he was the Chief of Paediatric Ophthalmology Dept. at the National Institute of Ophthalmology and Program Manager of the National Eye Care Program for improvement of eye care at primary and secondary level services in Bangladesh through increasing capacity of eye care service provider and strengthening coordination among GO-NGO and private eye care providers.

Prof. Hussain has shown his areas of interest in Clinical Science, Teaching, and public health related to Paediatric Ophthalmology & Community Ophthalmology as well as prevention of blindness and also control of Non Communicable Disease. He has 20 years' experience in undergraduate and Post Graduate teaching in Ophthalmology.

He is also the examiner of MS (Community Ophthalmology), MS (Ophthalmology), DO (Ophthalmology) of the Bangabandhu Sheikh Mujib Medical University and Dhaka University. Prof. Hussain is the visionary of Nayan Foundation (charitable Eye Hospital) in Sylhet. He is currently the Chairman (Bangladesh Chapter) of International Agency for Prevention of Blindness. He is also the coordinator for Bangladesh of International council of Ophthalmology.

He received Outstanding Service Award in prevention of Blindness at 31st Asia Pacific Academy Ophthalmology Congress 2016 and AK Das endowment award for contribution in prevention of blindness by Association of Community Ophthalmology India (ACOIN) in 2014 and also Prof. Mobarak Ali gold medal award from the Ophthalmological Society of Bangladesh for his outstanding contribution in prevention of blindness. Prof. Enayet Hossain can be reached at: paedeye@haoo.com



Faruk Ahmed Bhuiyan did his MBBS from the Dhaka Medical College in 1983 and MPH (Community Medicine) from the Dhaka University in 1988. He is the Line Director of the Non-Communicable Disease Control Program of the Directorate General of Health Services, Ministry of Health & Family Welfare, Government of Bangladesh. Before this he was the Deputy Director of Planning & Research Directorate General Health Services. He has extensive experience of working at upazila health complexes and district hospitals as a clinician as well as manager.

As a Line Director Dr. Faruk's responsibilities are: implementation of operation plan for Non-Communicable Disease Control Program, prevention of Non-Communicable Diseases, reduction of mortality and morbidity caused by Non-Communicable Diseases through strengthening health service delivery in management and referral for NCDs, promoting healthy lifestyle and healthy practices and developing an effective public health surveillance system; foster, support and promote social and economic

conditions that address the determinants of chronic Non-Communicable Diseases and empower people to increase control over their health and to adopt healthy behaviours; facilitate and support strengthening of the capacity and competencies of the health system for the integrated management of chronic Non-Communicable Diseases and their risk factors.

Dr. Faruk has conducted research in the areas of: Nutritional status of women at reproductive age in urban slum in Dhaka City, on Association of Socio demographic characteristics and disease profile and on the Perception of rural people attending the selected Community Clinic.

Dr. Faruk got training both within the country and abroad. He visited Finland, Denmark, Switzerland and many South Asian Countries for learning more on Non-Communicable Diseases, Planning & Management, and Evidence Based Policy Making. He also made presentations in national and international seminars. Dr. Bhuiyan can be reached at: drfaruk59@gmail.com



Aliya Naheed MBBS (DU), MPH (JHU) is the Head of the Initiative for Non Communicable Diseases Health Systems and Population studies Division ICDDR, B. She has lead a number research studies for assessing the burden of NCDs and modifiable risk factors in Bangladesh and other South Asian countries in order to develop primary care strategies for control and prevention of NCDs in LMICs, including cardiovascular disease, diabetes, childhood obesity, mental health and health systems. She has contributed in a number of global disease burden studies conducted by IHME published in the Lancet series. Dr. Naheed has a long track record in infectious disease epidemiological research. Her research contributed to the introduction of Hib vaccine in the national immunization program in 2009 and early introduction of pneumococcal vaccine in 2013 in Bangladesh. Her studies led WHO modify the first line therapy for treating dysenteriae type 1 and a rapid diagnostic tool for cholera made commercially available at low cost. Recently her study led to formulating a street food safety policy for the mobile street food vendors, which has been adopted by City Corporation authorities of Dhaka and Khulna for promoting street food safety. Dr. Naheed is an Asia Pacific Observatory Fellow, WHO and a member of BMJ South Asia Editorial Board. She has a good track record of publication in international peer-reviewed journals, and she was the lead Editor of Bangladesh Health is Transition published by World Health Organization. She serves as a member of several international professional organizations, including peer reviewed journals and ethics committees. Dr. Naheed can be reached at: anaheed@icddr.org



Sunjida Binta Ali is a public health professional working at Initiative for Non-Communicable Disease unit of Health System and Population Studies Division in International Center for Diarrhoeal Disease Research, Bangladesh (icddr, b). She is experienced in program implementation, material development and research methodologies. She had her graduation from Khulna University in Biotechnology and Genetic engineering and Masters in Public Health from James P Grant School of Public Health, BRAC University. She has worked in different health projects with icddr,b, James P Grant School Of Public Health, BRAC, Sajida Foundation and GlaxoSmithKline Bangladesh Ltd. The main area of her research has been universal health coverage and non-communicable diseases. Recently she was involved in conducting situational analysis of autism in Bangladesh. And currently she is working in a project of feasibility study of implementing a mental health care program and home-based training for mothers of children with autism spectrum disorder in Bangladesh. She can be contacted at: Sunjida.ali@icddr.org



M Mostafa Zaman, MBBS, MPH, PhD Epidemiology, FACE is a Bangladeshi physician epidemiologist. He started his epidemiological career in heart disease prevention in 1989 in the National Center for Control of Rheumatic Fever and Heart Diseases, Dhaka. Since then he has been playing a pioneering role in Bangladesh in prevention of rheumatic and other heart diseases and their risk factor control, with special focus to tobacco. He has at his credit more than 100 publications on non-communicable diseases; many of which appeared in high impact journals. Bangladesh Academy of Science awarded him in 2002 a prestigious Gold Medal Award for his outstanding research contributions.

He is the founder of the Ekhlaspur Center of Health (established in 1998) that promotes health in rural population with targeted programme for NCD registries, and tobacco, hypertension and diabetes control. A model has been established for identifying best possible methods for NCD prevention in rural areas of Bangladesh.

He has an extensive experience in leading a non-communicable disease cluster of WHO Bangladesh since 2003. In 2016 he has been promoted to the advisor position in the Research and Publication unit. His advisory role to the Government of Bangladesh has been reflected thorough legislative, strategic and programmatic shifts. Other notable technical supports include studies on NCD risk factors and establishment of the National Tobacco Control Cell under the Ministry of Health and Family Welfare. Dr. Zaman can be reached at: zamanm@who.int



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& ED of BJME. He has participated in 31 international seminars, completed 30 researches in the field of HPed and have 73 national and international publications. He involved in different activities of WHO, ActionAid Bangladesh, ORBIS International, ADPC, UNICEF, Concern World Wide, USAID and NSET.

Dr. Talukder is the Secretary General of AME Bangladesh, EC member, SEARAME, Publicity secretary, BBS, Treasurer, BASE, President, DOCS of Bangladesh. He was honoured with the Best Physician Award in Humanitarian Services ground by MSD, Bagerhat. Dr. Talukder can be reached at: hktalukder@yahoo.com



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He organized the activities of the country's first hospital-based cancer registry at NICRH. Contributed to develop national strategies and plan of actions related to cancer, NCDs and tobacco control. He

is a regular speaker in several television channels and, national and international radio stations on cancer awareness. He has published 12 articles in national international journals. Dr. Talukder can be reached at: ruskin1963@gmail.com



Md Rijwan Bhuiyan, BSc (Hons') in PT, M Phil in Public Health from Bangladesh Institute of Health Sciences, University of Dhaka with the grant of Norad's Programme for Master Studies (NOMA) scholarships, University of Oslo, Norway. He was one of the 'Tobacco Control Research Grant' recipients in 2014 funded by institute for global tobacco control, Johns Hopkins Bloomberg School of Public Health and Bangladesh Center for Communication Program. He is the active member of Bangladesh Health Education society and working in different health related awareness programs, trainings and research. Mr Bhuiyan has been one of the field team members to implement the recently completed national survey on epilepsy. Rijwan can be contacted at: physiorijwan@gmail.com



Kuhel Faizul Islam completed MPH from JPGSPH, BRAC University. He earned his BSc. in Biology (Major: Molecular Genetics) from University of Victoria (UVIC), British Columbia, Canada. He was the laboratory instructor for undergraduate students in the Dept. of Biology at UVIC. Later he moved to Riyadh, Saudi Arabia to take the position of Research Technical Officer at the Department of Comparative Medicine (Tuberculosis section) at King Faisal Specialist Hospital and Research Center where he also conducted training to Saudi graduate students in molecular techniques. In 2006 he joined International Organization for Migration (IOM), Bangladesh as the Microbiologist and Laboratory Coordinator. He oversaw the activities of all labs across Bangladesh run by IOM. He also received specialized training in gene extraction and DNA hybridization at the National TB laboratory in Bangkok, Thailand. He Joined JPGSPH in 2010 and worked under different capacities as Senior Researcher in projects and field intervention programmes. Currently he is the Programme Coordinator at JPGSPH and oversees some projects under the Centre of Excellence for Gender Sexual and Reproductive Health Rights (CGSRHR) in JPGSPH. He teaches in Ageing and Health module and also takes lectures in the Health Systems Management module in MPH program and also coordinates the internship program at JPGSPH. He co-authored a book chapter on health information systems for: Health in Transition: Bangladesh Health System Review for Asia Pacific Observatory on Public Health, a WHO publication. He has presented abstracts and conducted oral presentation in international conferences. He also co-authored a handbook on "Childhood Blindness in Asia" in collaboration with Orbis International. He

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Sifat Shahana Yusuf is currently working at icddr,b as a Research Investigator under the Health Systems & Population Studies Division. She received her undergraduate degree in Biomedical Science from Queen Mary, University of London in 2011 before moving on to complete her Master's in Public Health from the James P. Grant School of Public Health (JPGSPH), BRAC University in 2013. Sifat has gained much experience through her involvement in various projects that understand the determinants of health seeking behaviour, qualitative health systems research, and universal health coverage. Recently she has been working under a USAID funded-national level survey around maternal morbidity and health. Her area of interest lies in the field of urban health systems, health services research, and reproductive health. She also provides teaching assistance at JPGSPH by conducting lectures in the Anthropology & Qualitative Research module. Sifat can be reached at: sifat.s.yusuf@gmail.com



ANNEX TWO

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ANNEX THREE

BHW Publications

Challenge
of Achieving
Health Equity
(2006)



Moving Towards
Universal Health
Coverage
(2012)



Health
Workforce in
Bangladesh
(2008)



Urban Health
Scenario: Looking
Beyond 2015
(2015)



How Health
is Health
Sector
Governance?
(2010)



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