

Research Article

# Evaluating Health Policy Effectiveness in Reducing the Economic Burden of Non-Communicable Diseases in Bangladesh

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## Abstract

Non-communicable diseases (NCDs) represent a significant and growing public health challenge in Bangladesh, contributing to a substantial economic burden. Non-communicable diseases (NCDs), including cardiovascular diseases, diabetes, chronic kidney disease, cancers, and chronic respiratory conditions, represent a major health challenge in Bangladesh, contributing to substantial morbidity, mortality, and economic burden. The economic impact is profound, affecting both individuals and the broader economy through healthcare costs, loss of productivity, and long-term financial strain. This review aims to evaluate the effectiveness of health policies in mitigating the economic burden of NCDs in Bangladesh. The article begins with an overview of the prevalence and risk factors associated with NCDs, followed by an examination of the national health policies aimed at prevention, treatment, and management. The evaluation considers both successes and challenges, with a focus on policy implementation, healthcare financing, and access to care. Case studies highlight specific policy interventions that have demonstrated measurable success in reducing NCD prevalence and associated costs. The findings suggest that while significant progress has been made in policy formulation, challenges remain in ensuring comprehensive implementation and equitable access to healthcare services. Cost-effective strategies, such as scaling up preventive measures and improving healthcare infrastructure, are essential for reducing the economic burden of NCDs. The review concludes with recommendations for strengthening existing policies and exploring innovative approaches to sustain and enhance the impact of health policies on NCD management in Bangladesh.

## Keywords

Non-Communicable Diseases (NCDs), Economic Burden, Health Policy, Public Health Strategy, Health Economics, Healthcare Access, Disease Prevention, Bangladesh

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**Received:** 7 August 2024; **Accepted:** 28 August 2024; **Published:** 26 September 2024



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## 1. Introduction

Non-communicable diseases (NCDs), including cardiovascular diseases, diabetes, chronic respiratory diseases, and cancers, have emerged as major public health challenges in Bangladesh. The World Health Organization (WHO) reports that NCDs account for approximately 67% of all deaths in Bangladesh, making them the leading cause of mortality in the country. This escalating prevalence is attributed to a combination of factors such as urbanization, unhealthy diets, physical inactivity, and tobacco use [1, 2]. The rise of NCDs not only poses significant health risks but also imposes a substantial economic burden on the country, affecting individuals, families, and the national economy at large. The economic impact of NCDs is multifaceted. Direct costs include healthcare expenses such as hospitalization, medication, and outpatient care, while indirect costs arise from lost productivity due to illness, disability, and premature death [3, 4]. The World Bank has estimated that NCDs could result in a cumulative loss of \$3.5 trillion to low- and middle-income countries (LMICs) by 2030 if current trends continue, underscoring the urgent need for effective interventions. In Bangladesh, where the healthcare system is already under strain, the financial toll of NCDs exacerbates poverty and hinders economic development [5, 6].

Health policies play a crucial role in addressing the dual challenges of preventing NCDs and mitigating their economic impact. Effective health policies can lead to the implementation of comprehensive strategies that encompass prevention, early detection, and management of NCDs. These strategies may include public health campaigns, regulations on unhealthy products, initiatives to promote healthy lifestyles, and the strengthening of healthcare services to manage NCDs effectively. Bangladesh has recognized the importance of health policies in combating NCDs and has taken steps to implement national strategies aimed at reducing their prevalence [7]. For instance, the National NCD Control Program and the Strategic Plan for Surveillance and Prevention of Non-Communicable Diseases in Bangladesh (2011-2015) have outlined objectives to curb the rise of NCDs through awareness campaigns, screening programs, and improving healthcare infrastructure. Despite these efforts, challenges remain in ensuring the effectiveness and sustainability of these policies, particularly in a resource-limited setting [8].

The objective of this review is to evaluate the effectiveness of health policies implemented in Bangladesh in reducing the economic burden of NCDs. By examining the successes, challenges, and limitations of these policies, the review aims to provide insights into how health interventions can be optimized to alleviate the economic strain of NCDs on both individuals and the nation. Additionally, this review will explore the broader implications of these policies for future public health strategies in Bangladesh, offering recommendations for strengthening and expanding current

initiatives to achieve more significant impact.

This introduction sets the stage for a comprehensive examination of the effectiveness of health policies in reducing the economic burden of NCDs in Bangladesh, providing context, highlighting the importance of the issue, and clearly stating the objective of the review.

## 2. Overview and Outline of Non-Communicable Diseases in Bangladesh

In Bangladesh, non-communicable diseases (NCDs) such as cancer, diabetes, chronic kidney disease (CKD), heart disease, and chronic respiratory disorders have emerged as significant public health challenges. These diseases collectively account for a substantial portion of morbidity and mortality in the country, overshadowing the traditional burden of infectious diseases.

### 2.1. Diabetes Mellitus (DM)

Diabetes mellitus is one of the most prevalent non-communicable diseases in Bangladesh, with a rapidly increasing incidence. It is primarily characterized by chronic hyperglycemia due to insulin resistance or inadequate insulin secretion [9].

Risk Factors:

1. Genetic Predisposition: Family history of diabetes significantly increases risk.
2. Unhealthy Diet: High intake of processed foods, sugary beverages, and low fiber intake.
3. Physical Inactivity: Sedentary lifestyle contributes to obesity, a major risk factor for type 2 diabetes.
4. Obesity: Particularly central obesity is a strong risk factor for the development of diabetes.
5. Urbanization: Associated with lifestyle changes that increase the risk of diabetes.

Prevalence:

The prevalence of diabetes in Bangladesh has been increasing at an alarming rate. According to a study published in 2020, approximately 8.4% of the adult population in Bangladesh has diabetes, with higher rates in urban areas compared to rural regions [10].

### 2.2. Chronic Kidney Disease (CKD)

Chronic kidney disease is a progressive loss of kidney function over time, often linked to diabetes and hypertension. It leads to end-stage renal disease (ESRD), which requires dialysis or kidney transplantation [11].

Risk Factors:

1. Diabetes and Hypertension: The leading causes of CKD

in Bangladesh.

2. Glomerulonephritis: A common cause of CKD, particularly in younger populations.
3. Obesity: Increases the risk of hypertension and diabetes, which are primary contributors to CKD.
4. Aging Population: Age-related decline in kidney function.

Prevalence:

The prevalence of CKD in Bangladesh is rising, with studies indicating that approximately 12% of the adult population is affected, and many cases are related to poorly managed diabetes and hypertension [12].

### 2.3. Cardiovascular Disease (CVD)

Cardiovascular diseases, including ischemic heart disease, stroke, and hypertension, are the leading causes of mortality in Bangladesh. These conditions are closely associated with lifestyle and metabolic risk factors [13].

Risk Factors:

1. Tobacco Use: A major contributor to heart disease and stroke.
2. Hypertension: High blood pressure is a significant risk factor for stroke and heart attacks.
3. Diabetes: Increases the risk of CVD due to damage to blood vessels.
4. Unhealthy Diet: Diets high in saturated fats, salt, and low in fruits and vegetables.
5. Physical Inactivity: Lack of exercise contributes to

obesity and hypertension.

Prevalence:

Cardiovascular diseases account for around 30% of all deaths in Bangladesh. Hypertension prevalence is particularly high, with studies indicating that about 21% of the adult population suffers from high blood pressure [14].

### 2.4. Cancer

Cancer is a growing public health concern in Bangladesh, with increasing incidence rates across various types, including lung, breast, cervical, and oral cancers. Tobacco use is a major contributor to cancer burden in the country [16].

Risk Factors:

Tobacco Use: Smoking and smokeless tobacco are significant risk factors for lung, oral, and other cancers.

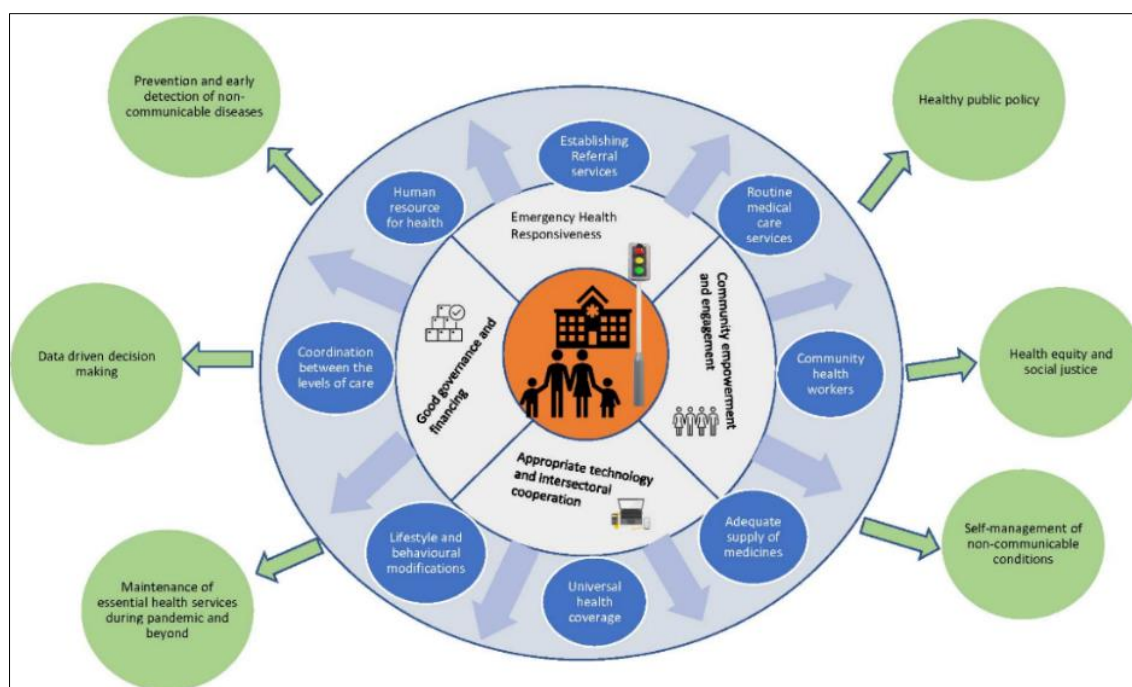
Infections: Human papillomavirus (HPV) is linked to cervical cancer, while hepatitis B and C viruses are linked to liver cancer.

Unhealthy Diet and Obesity: Contribute to the risk of various cancers.

Environmental Factors: Exposure to carcinogens such as pesticides and pollution.

Prevalence:

The cancer burden in Bangladesh is significant, with an estimated 150,000 new cases diagnosed annually. Lung cancer is the most common among men, while breast cancer is the most common among women [17].



**Figure 1.** Recognizing the roles of primary health care in addressing non-communicable diseases in low- and middle-income countries [15].

## 2.5. Chronic Respiratory Diseases

Chronic respiratory diseases, including chronic obstructive pulmonary disease (COPD) and asthma, are prevalent in Bangladesh. These conditions are often linked to environmental and lifestyle factors, including tobacco use and air pollution [18].

Risk Factors:

1. Tobacco Use: Smoking is a primary risk factor for COPD.
2. Indoor Air Pollution: Use of biomass fuels for cooking in rural areas contributes to chronic respiratory conditions.
3. Outdoor Air Pollution: Increasing urbanization and industrial activities lead to poor air quality.
4. Occupational Hazards: Exposure to dust, chemicals, and fumes in the workplace.

Prevalence:

COPD and asthma are widespread, with studies indicating that about 10% of adults suffer from chronic respiratory conditions. The prevalence is higher in rural areas due to the use of biomass fuels [19].

## 2.6. Overall Prevalence and Trends of NCDs in Perspective of Bangladesh

Non-communicable diseases (NCDs) have become a significant public health concern in Bangladesh. The country is witnessing an epidemiological transition where the burden of NCDs is increasing while communicable diseases remain prevalent. The major NCDs in Bangladesh include cardiovascular diseases, diabetes, cancers, and chronic respiratory diseases. According to the World Health Organization (WHO), NCDs account for approximately 67% of all deaths in Bangladesh, with cardiovascular diseases being the leading cause, followed by cancer, chronic respiratory diseases, and diabetes.

The prevalence of these conditions has been rising due to several factors, including urbanization, aging population, and changes in lifestyle behaviors such as increased consumption of unhealthy diets, tobacco use, and physical inactivity. The Bangladesh Demographic and Health Survey (BDHS) and various health surveys conducted over the years reveal a steady increase in the prevalence of NCDs across different population groups, particularly in urban areas where lifestyle changes are more pronounced [20].

## 2.7. General Risk Factors Associated with NCDs in Bangladesh

The major risk factors contributing to the rise of NCDs in Bangladesh include [21]:

1. Tobacco Use: Bangladesh has one of the highest rates of tobacco use globally, with about 35% of adults using tobacco in some form. This has significantly

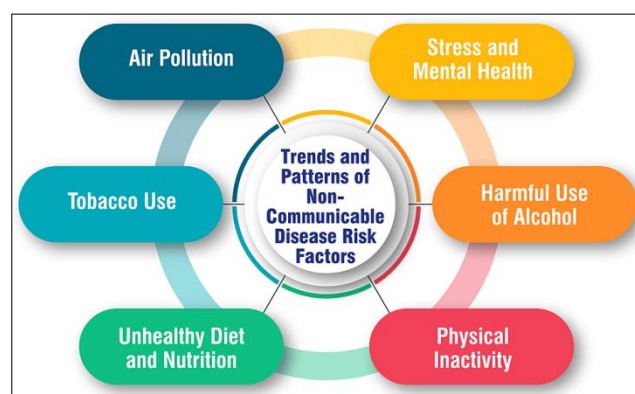
contributed to the rise in cardiovascular diseases, respiratory diseases, and cancers.

2. Unhealthy Diet: The consumption of diets high in salt, sugar, and trans fats has been linked to the rising prevalence of hypertension, diabetes, and cardiovascular diseases in Bangladesh.
3. Physical Inactivity: Urbanization has led to a decrease in physical activity, contributing to obesity, diabetes, and cardiovascular diseases. The urban population is particularly at risk due to sedentary lifestyles.
4. Air Pollution: Both indoor and outdoor air pollution are major contributors to chronic respiratory diseases in Bangladesh. The use of biomass fuel for cooking in rural areas and increasing vehicular emissions in urban areas exacerbate this issue.

## 2.8. Social and Economic Impact on Non-Communicable Diseases in Bangladesh

The impact of NCDs on the social and economic fabric of Bangladesh is profound. The economic burden includes direct healthcare costs, such as hospital admissions, medications, and outpatient visits, as well as indirect costs due to lost productivity, disability, and premature mortality. Studies have shown that households with NCD patients often experience catastrophic health expenditures, leading to increased poverty and financial instability.

Moreover, the dual burden of communicable and non-communicable diseases in Bangladesh strains the healthcare system, which is already under-resourced. The rising prevalence of NCDs requires significant investment in healthcare infrastructure, human resources, and public health interventions to prevent and manage these diseases effectively [20].



**Figure 2.** Trends and patterns of non-communicable disease risk factors [20].



### 3. Health Policies of Bangladesh in Addressing the Emerging Issues Regarding NCDs

Bangladesh has been facing a significant rise in non-communicable diseases (NCDs), prompting the government to develop and implement a range of health policies, strategies, and action plans. These efforts aim to mitigate the growing burden of NCDs through prevention, treatment, and health financing mechanisms.

#### 3.1. Policy Framework: Overview of National Health Policies, Strategies, and Action Plans

##### 3.1.1. National Health Policy 2011

The National Health Policy 2011 of Bangladesh provides a comprehensive framework for addressing the health needs of the population, including the rising burden of NCDs. The policy emphasizes the prevention and control of NCDs as a priority area and outlines strategies to strengthen primary healthcare services, enhance disease surveillance, and promote healthy lifestyles among the population [22].

##### 3.1.2. Multisectoral Action Plan for the Prevention and Control of Non-Communicable Diseases 2018-2025

This action plan, developed by the Ministry of Health and Family Welfare (MoHFW), is a critical component of Bangladesh's response to the NCD epidemic. It aligns with the WHO Global Action Plan for the Prevention and Control of NCDs 2013-2020 and sets specific targets to reduce the prevalence of NCD risk factors, improve access to NCD-related health services, and reduce premature mortality from NCDs by 25% by 2025. The plan emphasizes a multisectoral approach, involving various government ministries, civil society, and the private sector [23].

##### 3.1.3. Strategic Plan for Surveillance and Prevention of Non-Communicable Diseases in Bangladesh

This strategic plan focuses on establishing a robust surveillance system to monitor NCD trends, risk factors, and outcomes. It aims to strengthen data collection, research, and evidence-based policy-making to guide effective interventions for NCD prevention and control [24].

#### 3.2. Preventive Measures: Health Promotion, Awareness Campaigns, and Screening Programs

##### 3.2.1. Health Promotion and Awareness Campaigns

The government has launched several national campaigns to raise awareness about NCDs and their risk factors. These campaigns focus on promoting healthy diets, increasing physical activity, reducing tobacco and alcohol consumption, and encouraging regular health check-ups. For instance, the "Tobacco Control Law" was implemented to curb tobacco use, which is a major risk factor for NCDs. The law prohibits smoking in public places, bans tobacco advertising, and mandates graphic health warnings on tobacco packaging [25].

##### 3.2.2. Screening and Early Detection Programs

Bangladesh has initiated programs to screen for common NCDs such as hypertension, diabetes, and cancer. These programs are primarily implemented at the primary healthcare level, where health workers are trained to screen and refer patients for further treatment. The government has also introduced mobile health units in rural and underserved areas to provide screening services for NCDs. Early detection of NCDs is a key strategy to reduce the disease burden and improve treatment outcomes [26].

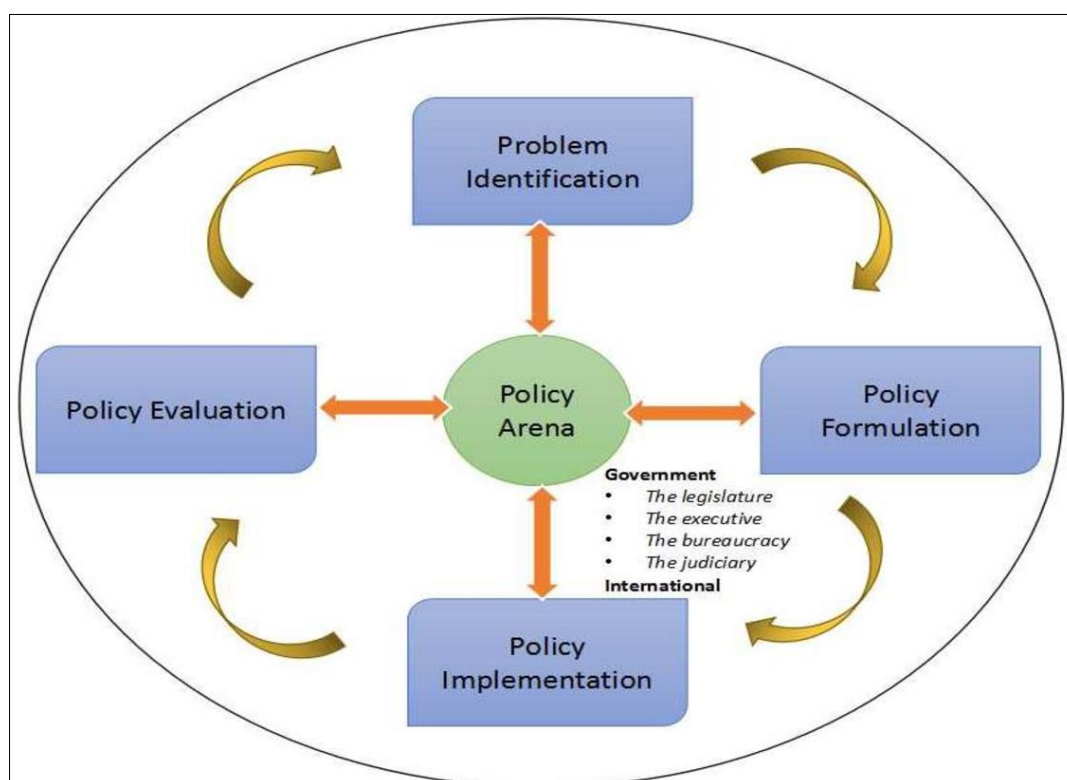
##### 3.2.3. School Health Programs

School-based programs have been introduced to promote healthy lifestyles among children and adolescents. These programs focus on nutrition education, physical activity, and anti-tobacco campaigns. The goal is to instill healthy behaviors early in life to prevent the onset of NCDs in adulthood [27].

#### 3.3. Treatment and Management: Access to Healthcare, Medication, and Rehabilitation Services

##### 3.3.1. Primary Healthcare Services

The government of Bangladesh has prioritized the integration of NCD management into primary healthcare services. This includes training healthcare providers to diagnose and manage common NCDs and ensuring that essential medications for NCDs are available at primary healthcare centers. The "Essential Drugs List" of Bangladesh includes medications for the treatment of hypertension, diabetes, and other NCDs, making them accessible to a larger portion of the population [28].



**Figure 3.** Policy Arena Throughout the Policy-Making Cycle [24].

### 3.3.2. Specialized NCD Clinics

To improve the management of NCDs, the government has established specialized NCD clinics at district and tertiary-level hospitals. These clinics provide comprehensive care, including diagnosis, treatment, counseling, and follow-up services for patients with chronic conditions such as heart disease, diabetes, and cancer [29].

### 3.3.3. Rehabilitation Services

Rehabilitation services for NCD patients are also being strengthened, particularly for those with chronic respiratory diseases and stroke survivors. These services include physiotherapy, occupational therapy, and counseling to help patients manage their conditions and improve their quality of life [30].

## 3.4. Health Financing and Insurance: Public Health Expenditure, Insurance Schemes, and Out-of-Pocket Costs

### 3.4.1. Public Health Expenditure

Despite the growing burden of NCDs, public health expenditure in Bangladesh remains relatively low. However, the government has increased budget allocations for NCD prevention and control in recent years. This includes funding for NCD screening programs, procurement of essential

medications, and establishment of specialized NCD clinics [31].

### 3.4.2. Health Insurance Schemes

To address the financial burden of NCDs on households, the government has introduced pilot health insurance schemes targeting low-income populations. These schemes cover the cost of treatment for common NCDs and aim to reduce out-of-pocket expenditures. The success of these pilot programs could lead to broader implementation of health insurance for NCDs across the country [32].

### 3.4.3. Out-of-Pocket Costs

Out-of-pocket expenditure remains a significant barrier to accessing NCD care in Bangladesh. Many patients face high costs for medications, diagnostic tests, and specialist consultations. The government is working to reduce these costs by increasing the availability of generic medications and expanding public health services to reach more people, particularly in rural areas. Bangladesh has made considerable progress in developing and implementing policies to address the rising burden of NCDs. However, challenges remain in terms of effective implementation, equitable access to healthcare services, and reducing the financial burden on households. Continued efforts to strengthen the health system, improve health financing, and enhance public awareness are essential to curb the NCD epidemic in Bangladesh [33].

## 4. Evaluation of Health Policy Impact on Non-Communicable Diseases in Bangladesh

### 4.1. Methodology for Evaluation

To evaluate the impact of health policies on non-communicable diseases (NCDs) in Bangladesh, a comprehensive and multi-method approach is typically employed [34]. This includes:

#### Data Analysis:

1. Population Health Surveys: Analysis of large-scale health surveys such as the Bangladesh Demographic and Health Survey (BDHS), which provide data on the prevalence, risk factors, and management of NCDs.
2. Health Information Systems: Use of national health databases to track changes in NCD incidence, mortality rates, and healthcare utilization over time.
3. Epidemiological Studies: Longitudinal and cross-sectional studies that assess trends in NCDs and their risk factors before and after policy implementation [35].

#### Economic Models:

1. Cost-Benefit Analysis: Economic models are used to estimate the cost-effectiveness of health policies by comparing the costs of policy implementation against the economic savings from reduced healthcare costs and improved productivity.
2. Disability-Adjusted Life Years (DALYs): Measurement of the reduction in disease burden through DALYs averted, which considers both morbidity and mortality.
3. Impact on Healthcare Expenditure: Analysis of how policies have influenced public and private healthcare spending, particularly out-of-pocket expenses for NCD management [35].

#### Case Studies:

1. In-Depth Case Studies: Examination of specific health policies or programs, such as tobacco control initiatives or diabetes management programs, to assess their effectiveness in real-world settings.
2. Comparative Studies: Evaluation of similar health policies in other countries to identify best practices and contextual challenges in Bangladesh [36].

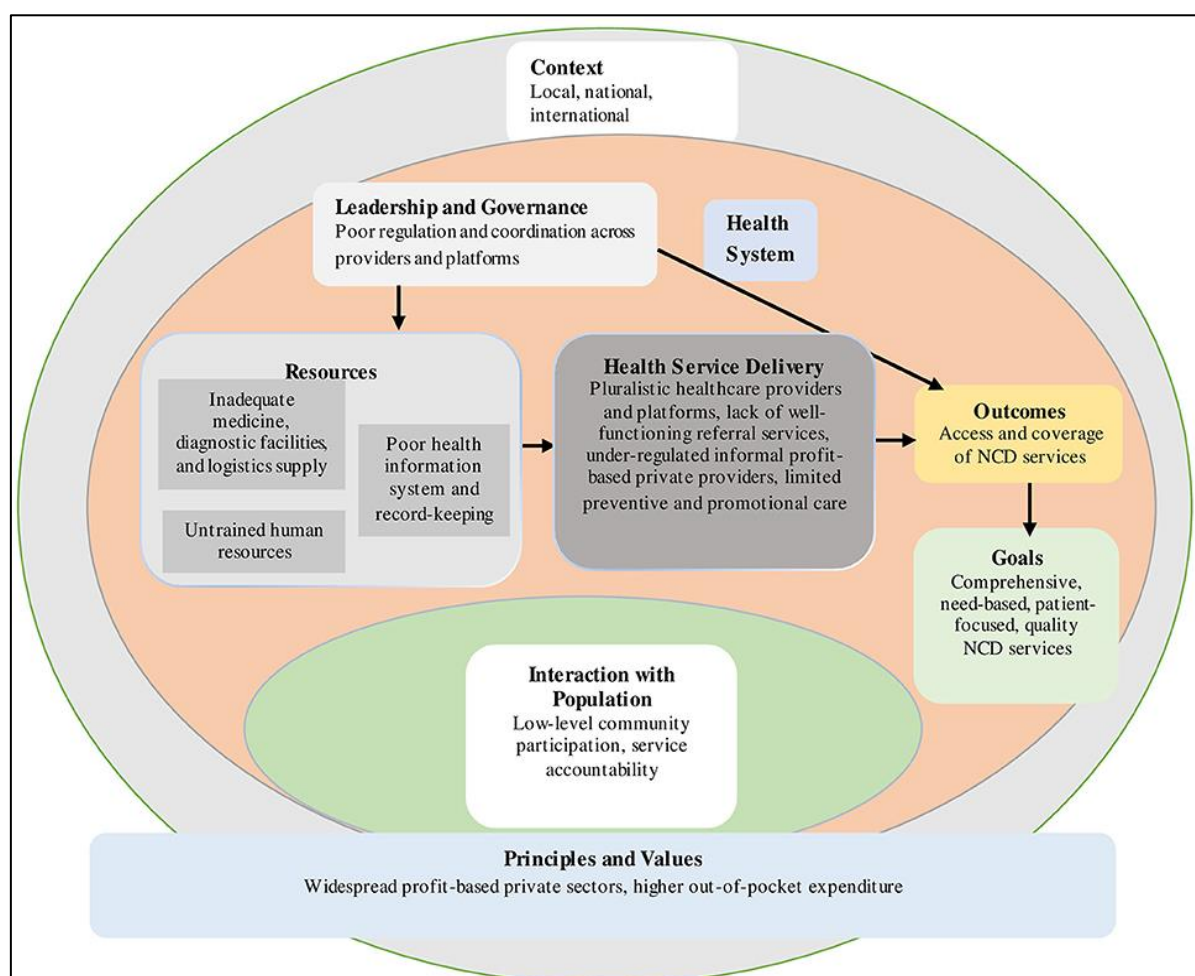


Figure 4. Health system dynamics framework on health system challenges to organize NCD services at the PHC level [34].

## 4.2. Successes and Achievements

Tobacco Control Policies [37]:

1. Success: Bangladesh has implemented several tobacco control policies, including graphic health warnings on cigarette packages, smoke-free zones, and increased taxes on tobacco products.
2. Outcome: These measures have led to a reduction in smoking rates, particularly among younger populations, contributing to a decline in tobacco-related NCDs such as lung cancer and cardiovascular diseases.
3. Economic Impact: Reduced tobacco consumption has resulted in lower healthcare costs related to smoking-related illnesses.

National NCD Strategy and Action Plan [38]:

1. Success: The Government of Bangladesh has developed a comprehensive NCD Strategy and Action Plan, focusing on prevention, early detection, and management of NCDs.
2. Outcome: Initiatives such as community-based health promotion programs and the integration of NCD services into primary healthcare have improved access to care and early diagnosis, particularly in rural areas.
3. Economic Impact: Early detection and management of NCDs have helped in reducing the economic burden by preventing complications and reducing the need for costly secondary and tertiary care.

Health Financing and Insurance Schemes [39]:

1. Success: Introduction of health financing initiatives, including social health insurance programs and targeted subsidies for low-income populations.
2. Outcome: These programs have improved access to essential NCD services, reducing out-of-pocket expenses for chronic disease management.
3. Economic Impact: Enhanced financial protection for vulnerable populations has mitigated the risk of catastrophic health expenditures due to NCDs.

## 4.3. Challenges and Limitations

Resource Constraints:

Challenge: Limited financial and human resources have hindered the full implementation of NCD policies, particularly in rural and underserved areas.

Impact: Inadequate infrastructure and shortage of trained healthcare providers have limited the effectiveness of NCD prevention and management programs [40].

Healthcare System Fragmentation:

Challenge: The healthcare system in Bangladesh is often fragmented, with overlapping responsibilities between public, private, and NGO sectors, leading to inefficiencies.

Impact: Poor coordination and lack of integration of services have resulted in gaps in NCD care, particularly in follow-up and continuity of care [41].

Socioeconomic and Cultural Barriers:

Challenge: Socioeconomic factors such as poverty, low literacy rates, and cultural beliefs often prevent individuals from seeking preventive care or adhering to treatment regimens.

Impact: These barriers have limited the reach and impact of health policies, particularly among vulnerable populations [41].

Policy Implementation and Monitoring:

Challenge: While Bangladesh has developed several NCD-related policies, the implementation and monitoring of these policies have been inconsistent.

Impact: Lack of rigorous monitoring and evaluation mechanisms has made it difficult to measure the true impact of policies and make necessary adjustments [39].

## 5. Case Studies and Examples in Health Policy Implementation for NCDs in Bangladesh

### 5.1. National Case Studies

#### 5.1.1. National Tobacco Control Program

Overview:

Tobacco use is a leading risk factor for many NCDs, including cardiovascular diseases, cancer, and chronic respiratory diseases in Bangladesh. To address this, the government implemented the National Tobacco Control Program (NTCP) under the Tobacco Control Act of 2005, which was further strengthened by amendments in 2013 [42].

Key Measures:

Public Smoking Ban: The NTCP enforced a ban on smoking in public places and transport, accompanied by substantial fines for violations.

Graphic Health Warnings: Mandatory graphic warnings on tobacco product packaging to discourage use.

Taxation: Significant increases in tobacco taxes to reduce affordability, especially among youth and low-income groups.

Awareness Campaigns: Extensive public awareness campaigns highlighting the dangers of tobacco use, targeting both urban and rural populations.

Impact:

Reduction in Tobacco Use: Between 2009 and 2017, the prevalence of smoking among adults decreased from 23% to 18% according to the Global Adult Tobacco Survey (GATS).

Decline in Tobacco-Related Diseases: The reduction in tobacco use has been linked to a decline in tobacco-related diseases such as lung cancer and cardiovascular conditions, contributing to improved public health outcomes.

Challenges:

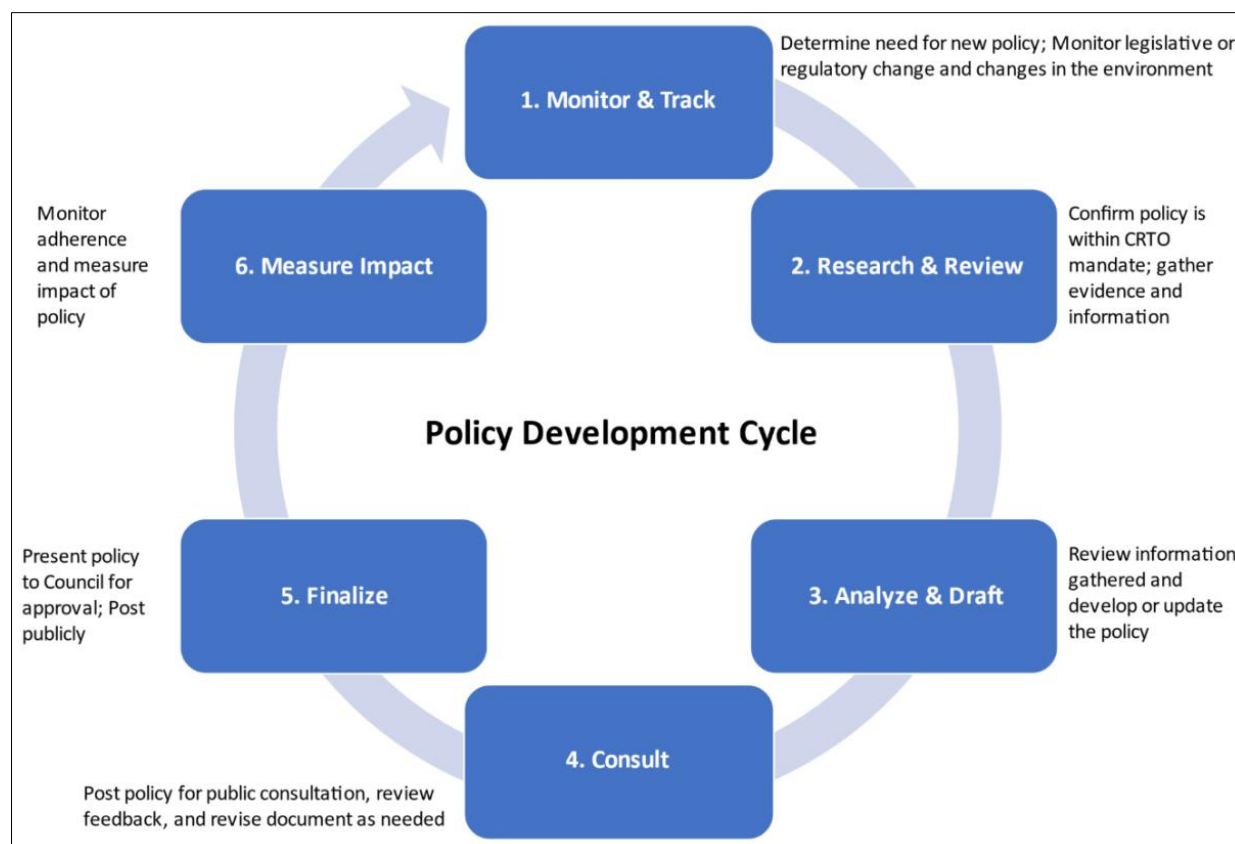
Enforcement Issues: Despite the legislative framework, enforcement of smoking bans and taxation policies remains



inconsistent, particularly in rural areas.

Smokeless Tobacco: The prevalence of smokeless tobacco

use remains high, requiring more targeted interventions.



**Figure 5.** Health Policy Making Process in Developing Countries [43].

### 5.1.2. National Nutrition Policy (NNP) and Non-Communicable Diseases

Overview:

The National Nutrition Policy (NNP) of Bangladesh, implemented in 2015, aims to improve the nutritional status of the population by addressing both undernutrition and the rising burden of NCDs. The policy recognizes the critical link between nutrition and NCDs, particularly in the context of obesity, diabetes, and cardiovascular diseases [44].

Key Measures:

**Promotion of Healthy Diets:** The NNP promotes the consumption of balanced diets rich in fruits, vegetables, whole grains, and low in salt, sugar, and unhealthy fats.

**Fortification Programs:** Introduction of food fortification programs, such as fortified rice and salt iodization, to address micronutrient deficiencies that contribute to NCDs.

**School-Based Programs:** Implementation of nutrition education in schools to promote healthy eating habits from an early age.

Impact:

**Reduction in Childhood Obesity:** School-based nutrition programs have contributed to a modest reduction in the

prevalence of childhood obesity in urban areas.

**Improved Awareness:** Increased awareness of the importance of healthy eating has been observed, particularly among women of reproductive age.

Challenges:

**Implementation Gaps:** There are gaps in the implementation of the NNP, especially in rural areas where access to fortified foods and nutrition education is limited.

**Cultural Barriers:** Traditional dietary practices and preferences continue to pose challenges to the widespread adoption of healthy diets.

## 5.2. Global Comparisons

### 5.2.1. Thailand's Universal Health Coverage (UHC) and NCD Management

Overview:

Thailand's Universal Health Coverage (UHC) scheme, implemented in 2002, has been widely regarded as a model for improving access to healthcare services, including those for NCD prevention and management. The scheme covers all Thai citizens and provides access to essential health services

at minimal or no cost [45].

Key Features:

**Primary Care Strengthening:** Emphasis on primary care facilities to manage NCDs, reducing the need for hospitalization.

**NCD Clinics:** Establishment of NCD clinics across the country that offer screening, diagnosis, and management services for conditions such as diabetes, hypertension, and cardiovascular diseases.

**Preventive Services:** Free access to preventive services, including health check-ups, vaccination, and health education programs.

Impact:

**Improved NCD Outcomes:** Thailand has seen significant improvements in NCD outcomes, including a reduction in mortality rates from diabetes and cardiovascular diseases.

**Equity in Health Access:** The UHC scheme has ensured that even the poorest segments of the population have access to essential NCD care, reducing health disparities.

Relevance to Bangladesh:

**Lessons for Bangladesh:** Bangladesh could draw lessons from Thailand's focus on primary care and the integration of NCD services into the UHC framework. Ensuring that NCD services are accessible at the community level could significantly improve outcomes.

### 5.2.2. Brazil's Family Health Strategy (FHS)

Overview:

Brazil's Family Health Strategy (FHS) is a community-based primary healthcare model that has been effective in addressing NCDs across the country. Launched in 1994, the FHS focuses on preventive care, health promotion, and the management of chronic diseases through multidisciplinary teams [46].

Key Features:

**Community Health Workers:** Deployment of community health workers (CHWs) who conduct home visits, provide health education, and monitor chronic conditions.

**Integrated Care:** The FHS integrates NCD management into routine primary care services, ensuring continuity of care.

**Focus on Equity:** The strategy prioritizes underserved and rural populations, ensuring that they receive essential NCD care.

Impact:

**Reduction in Mortality:** Brazil has experienced a reduction in mortality rates from NCDs, particularly in regions covered by the FHS.

**Enhanced Access:** The FHS has expanded access to primary healthcare, reducing the burden on secondary and tertiary care facilities.

Relevance to Bangladesh:

**Community-Based Approach:** Bangladesh could benefit from adopting a similar community-based approach, where CHWs are utilized to extend NCD care to remote and underserved areas. This could improve early detection and management of NCDs at the community level.

## 6. Commercial and Economic Analysis of Implementing Policies for NCDs in Bangladesh

### 6.1. Cost-Effectiveness of Policies

Implementing health policies targeting non-communicable diseases (NCDs) in Bangladesh has shown to be cost-effective, particularly when focusing on prevention, early detection, and management strategies. Policies that promote lifestyle changes, such as tobacco control, dietary improvements, and increased physical activity, have proven to reduce the incidence of NCDs significantly. For instance, tobacco taxation and smoking cessation programs are highly cost-effective, leading to a decrease in cardiovascular diseases and cancer, while also generating additional revenue for the government [47].

Moreover, early screening and treatment programs for conditions like hypertension and diabetes are cost-effective in preventing complications such as stroke, heart attack, and kidney failure, which are far more expensive to treat. By investing in these preventive measures, the government can reduce the long-term healthcare costs associated with managing advanced NCDs, thereby alleviating the economic burden on the healthcare system [48].

### 6.2. Economic Savings

Reducing the prevalence and impact of NCDs through effective health policies leads to substantial economic savings for both individuals and the nation. For individuals, preventing or delaying the onset of NCDs can significantly reduce out-of-pocket healthcare expenses, which are often catastrophic and push families into poverty. At the national level, reducing NCD prevalence decreases the demand for costly treatments and long-term care, allowing the reallocation of resources to other essential health services [49, 50].

Additionally, healthier populations contribute more effectively to the economy through increased productivity and reduced absenteeism. This, in turn, boosts economic growth and reduces the economic losses associated with disability and premature mortality. Studies suggest that every dollar invested in NCD prevention and control yields multiple returns in terms of economic benefits and improved public health outcomes [51].

## 7. Conclusion

The evaluation of health policies aimed at reducing the economic burden of non-communicable diseases (NCDs) in Bangladesh reveals that while there have been significant strides in policy implementation, gaps remain in achieving comprehensive coverage and cost-effectiveness. Key

policies such as tobacco control, public health campaigns on diet and physical activity, and improved access to healthcare services have contributed to a reduction in NCD-related morbidity and mortality. However, the overall impact on economic savings has been limited by challenges in policy enforcement, resource allocation, and public awareness. The findings highlight the need for more robust, integrated, and scalable health policies that address both the prevention and management of NCDs. Future policy planning in Bangladesh should prioritize the expansion of preventive health measures, such as increasing taxation on tobacco and unhealthy foods, and promoting healthier lifestyles through widespread public health initiatives. Additionally, there is a critical need for policies that enhance access to affordable, quality healthcare services, particularly in rural and underserved areas. Strengthening health systems, improving data collection, and fostering cross-sectoral collaboration will be essential for future policy success. Sustained policy efforts are vital to effectively reducing the economic burden of NCDs in Bangladesh. As NCDs continue to pose a significant threat to public health and economic stability, the importance of ongoing investment in preventive and management strategies cannot be overstated. A continued focus on cost-effective interventions, combined with strong political will and community engagement, will be crucial in ensuring that the gains made in NCD prevention and control are not only maintained but also scaled up to meet future challenges.

## Author Contributions

**Noman Perves:** Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing

**M. Muzaherul Huq:** Conceptualization, Methodology, Project administration, Resources, Supervision, Validation, Visualization

**Maleka Sultana:** Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing

**Anwar Islam:** Conceptualization, Data curation, Investigation, Methodology, Resources, Supervision, Validation, Visualization

## Conflicts of Interest

The authors declare conflicts of Interest.

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