

# The Growing Concern of Cardiovascular Diseases among Urban Youth in Bangladesh: Intersecting Risks of Unplanned Urbanization, Sedentary Lifestyles, Changing Disease Demographics, and the National Economy

Al Amin<sup>1</sup>, Sumaiya Tabassum<sup>2</sup>, Rasel Hossain Biswas<sup>3</sup>, Uday Kanti Das<sup>4</sup>, Zahir Uddin<sup>5</sup>,  
Shila Debnath<sup>6</sup>, Kallol Debnath<sup>7\*</sup>

<sup>1, 2, 7</sup> Department of Pharmacy, Faculty of Life Sciences, University of Development Alternative,  
Dhaka-1209, Bangladesh

<sup>3</sup> Department of Pharmacy, School of Science, Engineering and Technology, Manarat International University,  
Dhaka-1340, Bangladesh

<sup>4</sup> Department of Pharmacy, Faculty of Medical & Allied Health Sciences, Brainware University, Kolkata,  
West Bengal-700125, India

<sup>5</sup> Department of Pharmacy, Faculty of Science & Engineering, World University of Bangladesh,  
Dhaka-1230, Bangladesh

<sup>6</sup> Department of English, Faculty of Arts, University of Development Alternative, Dhaka-1209, Bangladesh

ORCID ID: <sup>1</sup> 0009-0005-7272-2234, <sup>2</sup> 0009-0003-6854-2666, <sup>3</sup> 0009-0001-6097-4873,  
<sup>5</sup> 0009-0007-6172-0262, <sup>6</sup> 0009-0007-0482-0283, <sup>7</sup> 0000-0003-0429-829X

\* **Corresponding Author:** Professor Dr. Kallol Debnath, Department of Pharmacy, Faculty of Life Sciences,  
University of Development Alternative (UODA), Dhaka-1209, Bangladesh  
kalloldebnath@pharmacy.uoda.edu.bd

## ORIGINAL ARTICLE

### Abstract

In recent decades, Bangladesh has experienced a significant epidemiological shift, characterized by the rising burden of Non-communicable diseases (NCDs) displacing Communicable ones (CDs). This transition is epitomized by the ascent of Cardiovascular diseases (CVDs) as the key cause of national morbidity and mortality. While historically associated with the elderly, CVDs prevalence is rising alarmingly among the urban youth (18-35 years - defined in the National Youth Policy 2017 of Bangladesh) in the Low- and middle-income countries (LMICs) like Bangladesh. The country is experiencing significant changes in its socio-economic landscape because of burgeoning population and rapid migration from rural to urban areas. This demographic shift is propelled by rapid and unplanned urbanization, which fosters obesogenic environments, dietary transitions to processed foods, sedentary lifestyles, environmental pollution, and other stressors impacting the population socioeconomically. Gender-specific risks are evident, with young urban males exhibiting high-risk

profiles linked to smoking and stress, while their female counterparts demonstrate high rates of obesity and physical inactivity. This evolving health environment has thereby predisposed a previously low-risk population to early-onset hypertension, ischemic heart disease, and stroke.

This article analyzes the epidemiological patterns and multifactorial risks behind the emerging public health crisis of CVDs in urban Bangladesh. It identifies shortcomings in the existing healthcare framework, which remains focused on communicable infections and is inadequate for addressing the rising incidence of NCDs among the youth. The analysis also evaluates the population health impact, detailing the profound economic and social implications of premature morbidity and mortality in this most productive demographic.

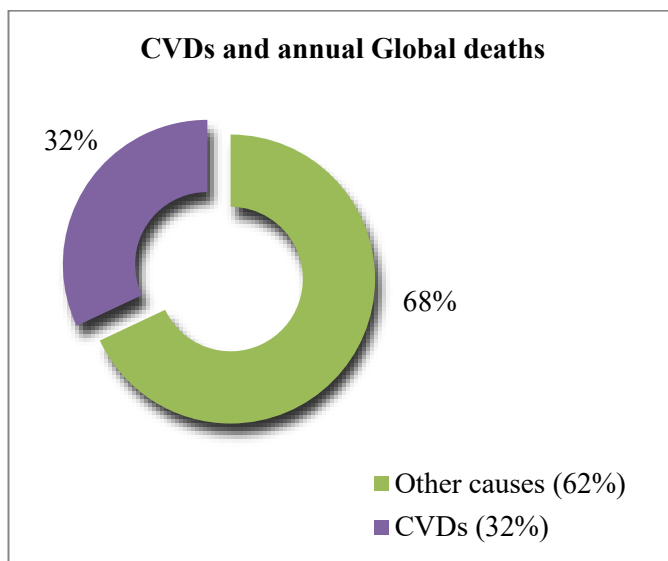
To prevent a future surge in cardiovascular morbidity and mortality within this productive demographic, implementing urgent multi-sectoral strategy is essential. Required measures include policy interventions for healthier cities, robust public health screening programs, and targeted lifestyle interventions. Successfully addressing CVDs reduces the disease burden while

simultaneously accelerating progress across a range of Sustainable Development Goals (SDGs).

**Keywords:** Cardiovascular diseases, Urbanization, Sedentary behavior, Disease demography, Obesogenic environment, Economic burden, Youth, SDGs, Bangladesh.

## Introduction

Cardiovascular diseases (CVDs) encompass a wide range of conditions that affect heart and blood vessels, including coronary artery disease, hypertension, stroke, heart failure, etc. Hypertension is the top factor behind CVDs. CVDs are the leading cause of premature deaths worldwide, representing a paramount public health challenge that accounts for an estimated 19.8 million premature deaths in 2022, or approximately 32% of all global deaths, with >75% of these deaths occurring in the LMICs (WHO, 2025). In addition, globally CVDs attribute to 85% of all disabilities (Hussain et al., 2013).

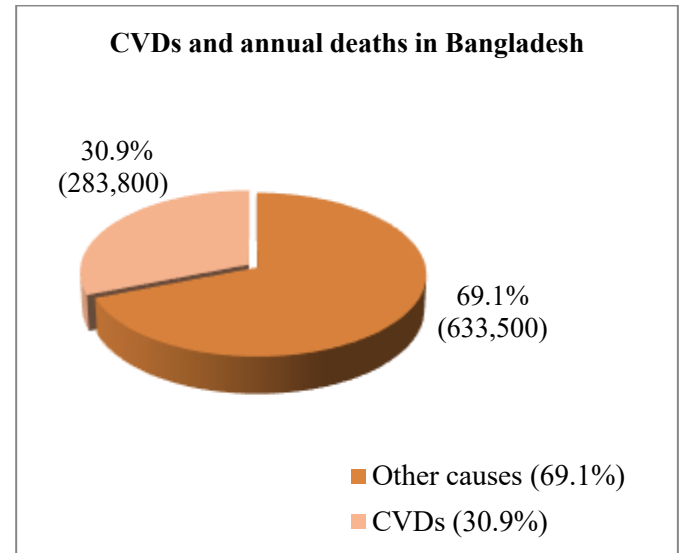


**Figure 1: Annual Global deaths and share of CVDs (WHO, 2025).**

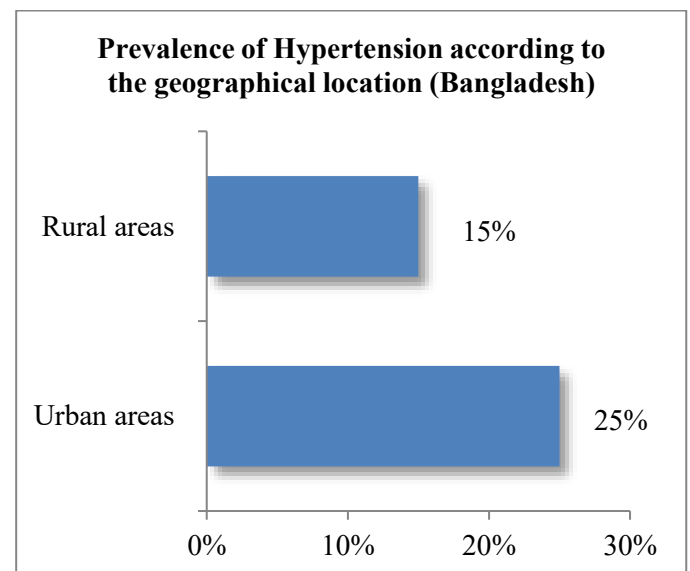
South Asia is a particularly vulnerable region, and Bangladesh, a LMIC undergoing profound societal transformation, exemplifies this troubling trend in recent years. CVDs and its associated risk factors account for 13.4% of Disability adjusted life years (DALYs) lost in the Country (El-Saharty et al., 2013).

The Institute for Health Metrics and Evaluation (IHME) states, around 10.26 million Bangladeshis currently live with some form of heart disease. Each year, nearly 992,736 new cases are reported, equivalent to 2,720 new patients every day (Shishir Moral & Shishir Moral, 2025).

Data from the World Health Organization (WHO)'s Global Report on Hypertension (September 2025) underscores a critical health burden in Bangladesh: CVDs are responsible for 283,800 deaths annually and 52% of these deaths are linked to hypertension. This constitutes 30.9% of the nation's total mortality and equates to an average of 777 daily deaths from heart and vascular conditions (WHO, 2023; Sami & Sami, 2023).



**Figure 2: Annual deaths and share of CVDs in Bangladesh (WHO, 2023; Sami & Sami, 2023).**



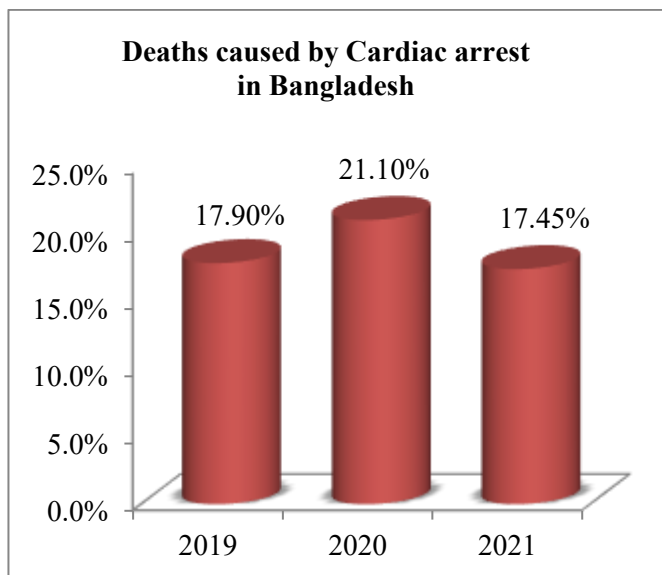
**Figure 3: Prevalence of Hypertension according to the geographical location (Bangladesh) of the study participants (Chowdhury et al., 2020).**

According to Chowdhury et al. (2020), the weighted pooled prevalence of hypertension was 25% in urban settings, significantly exceeding the 15% observed in rural settings.

The Bangladesh Bureau of Statistics (BBS) reported that cardiac arrests claimed a notable share of lives annually

(BBS, 2022). The nation has undergone a profound epidemiological transition, shifting from a burden dominated by communicable diseases and maternal/child health issues to one increasingly defined by NCDs, with CVDs now being the leading cause of death and disability nationwide (Biswas et al., 2017; Islam et al., 2021).

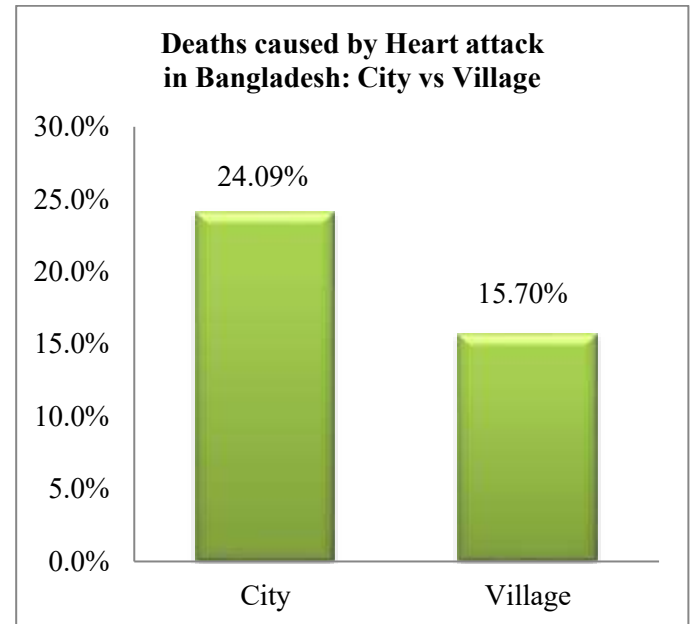
Alarming, this burden is not confined to the elderly but is increasingly affecting the youth, a demographic that constitutes the core of the nation's workforce. Clinical audits from major hospitals in cities like Dhaka and Chittagong, alongside community-level data, report a significant and rising number of admissions for acute coronary syndromes, myocardial infarctions, and strokes in patients <40 (Rahman et al., 2020; Hussain & Hossain, 2019).



**Figure 4: Share of deaths caused by Cardiac arrest in Bangladesh by year (BBS, 2022).**

This trend contradicts the traditional perception of CVD as a disease of the elderly and threatens to impair national economic productivity and compound healthcare costs. In Bangladesh, CVDs pose a formidable challenge to public health, impacting the lives of countless individuals and straining the healthcare system.

Truthful information on the prevalence of CVDs is restricted in Bangladesh due to the lack of a population-based surveillance system and comprehensive national health data (Chowdhury MZ et al., 2018 & Chowdhury MZ et al., 2018).



**Figure 5: Share of deaths caused by Heart attack in Bangladesh: City vs. Village (Shishir Moral, 2024).**

This paper aims to synthesize the evidence on the rising prevalence of CVDs among urban youth in Bangladesh. It will argue that this crisis is not an isolated medical phenomenon or the result of a single factor, but is the direct and inevitable consequence of a complex interplay between rapid unplanned urbanization, the subsequent adoption of sedentary lifestyles, a nutritional transition towards unhealthy diets, air pollution, psychosocial stress, and the resulting change in disease demographics. Understanding this complex interplay is critical for designing effective preventive strategies and a framework for urgent public health action.

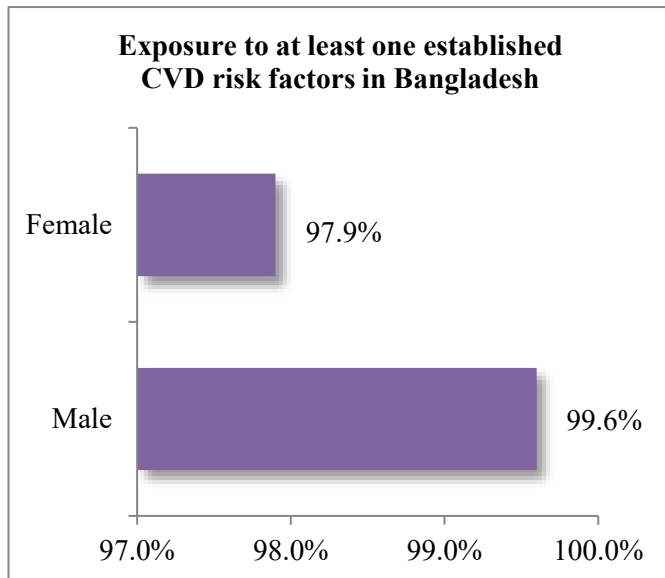
## Epidemiology of CVDs in Bangladesh

### 1. National burden and urban-rural disparities:

In Bangladesh, 99.6% males and 97.9% females are exposed to at least one established CVD risk factors (Khanam et al., 2019) and at risk of CVD at a younger age (below 40 years in men) (El-Saharty et al., 2013; Islam et al., 2014; Enas et al., 1996). Epidemiological data reveal a significant urban-rural disparity in CVD burden, driven by distinct profiles of lifestyle and environmental risk factors.

### 2. Rising prevalence of risk factors in young adults:

Recent epidemiological studies reveal an alarming increase in traditional CVD risk factors (e.g., hypertension, diabetes, dyslipidemia) among young adults in Bangladesh (Yesmin et al., 2023). Illustrating this trend, a study in Dhaka found that 10% of university students were hypertensive and 8% were obese (Rahman et al., 2022).



**Figure 6: In Bangladesh, exposure to at least one established CVD risk factors (Khanam et al., 2019).**

Among those aged 25 and above, 29.1% engage in insufficient physical activity, with women being more physically active than men. At the same time, 20.3% of adults in this age group are obese, with obesity more common among women (Shishir Moral & Shishir Moral, 2025). The early onset of these conditions significantly elevates the lifetime risk of developing coronary artery disease, heart failure, and stroke (Mendis et al., 2011).

### 3. Gender-specific risk profiles:

CVD risk factors in Bangladesh demonstrate a distinct gender dimension. Men exhibit higher rates of hypertension and smoking, whereas women show a greater prevalence of obesity and physical inactivity (Afroze et al., 2020). Young women in urban areas face an additional risk layer due to sedentary occupations and metabolic changes associated with reproductive health.

## The triad of risk: Major contributing factors

### 1. Poor urbanization and CVD hazards:

**1.1 Unplanned urban growth:** Bangladesh is experiencing one of the world's most rapid urban expansions, with >37% of its population now residing in urban areas (BBS, 2022). However, this growth is largely unplanned, leading to the proliferation of slums, severe traffic congestion, high levels of air pollution, insufficient green spaces, and inadequate infrastructure (Hossain, 2021). Mass migration to cities has led to haphazard urbanization, which

creates critical environmental and social stressors that contribute to cardiometabolic dysfunction.

### 1.2 Key environmental stressors:

**Air pollution:** As the world's 2nd-most polluted country (IQAir, 2024), Bangladesh faces severe cardiovascular health risks, particularly in cities like Dhaka. Both short- and long-term exposure to this pollution are significant risk factors for CVDs. Acute exposure increases hospital admissions and mortality from CVDs in Dhaka (Rahman et al., 2021), while chronic exposure promotes hypertension, atherosclerosis, and arrhythmias (Brook et al., 2010). Data from the World Heart Federation indicates that air pollution accounts for 25% of global CVDs mortality, resulting in 7 million annual deaths. The Global Air Pollution Report 2020 said that PM<sub>2.5</sub> is responsible for 15% of CVD-related deaths in Bangladesh (Shishir Moral & Shishir Moral, 2022). Fine particulate matter (PM<sub>2.5</sub>/PM<sub>10</sub>), volatile organic compounds (VOCs), heavy metals, and other pollutants can cause cardiovascular damage by triggering inflammation and oxidative stress in the lungs, which then spreads systemically. This response leads to endothelial dysfunction, accelerates atherosclerosis, and can cause arrhythmias and blood clots (Montone et al., 2023).

**Noise pollution:** Chronic exposure to traffic noise acts as a persistent physiological stressor. It disrupts sleep and elevates stress hormones like cortisol, which contributes to the development of hypertension and other CVDs (Münzel et al., 2021).

**Loss of green spaces:** Scarcity of accessible parks and recreational areas has a dual negative effect: it discourages physical activity and removes a vital buffer for mental stress. This deficiency also exacerbates the urban heat island effect, further compounding public health challenges.

**1.3 Psychosocial urban stressors:** Urban life generates constant stress from noise, overcrowding, long commutes, and job insecurity. This unrelenting pressure keeps the body's "fight or flight" system constantly active, which is a known cause of hypertension and CVDs (Sapolsky, 2018).

### 2. Nutritional transition and behavioral risks:

**2.1 Dietary shift:** Bangladesh is undergoing a significant nutritional transition, moving away



from its traditional balanced diet to a pattern of high-calorie diets - high in processed, unhealthy fat, salt, and sugar. These modern dietary options are typically rich in trans fats, salt and sugar (Siddiquee et al., 2020). Driven by cost and convenience, this shift results in a diet deficient in protective nutrients like fiber, antioxidants, and potassium. A particular concern is the rising consumption of sugar-sweetened beverages and energy drinks among urban youth, which is directly linked to increasing rates of obesity, dyslipidemia, and type 2 diabetes (Faruque, G. M., et al., 2019).

**2.2 High prevalence of tobacco and alcohol use:** While alcohol consumption is relatively low in Bangladesh, the country faces a major public health crisis from tobacco use. Over 45% of adult men smoke, and prevalence is rising among younger cohorts (WHO, 2021). Additionally, the use of smokeless tobacco products is widespread among women, presenting a significant and often overlooked cardiovascular risk factor.

### 3. Sedentary behavior and stress:

**3.1 High prevalence of physical inactivity:** In Bangladesh, over 60% of urban adults are physically inactive, failing to meet the WHO's recommended 150 minutes of moderate weekly exercise and leading to higher rates of obesity, insulin resistance, and poor cardiometabolic health. This is primarily attributed to sedentary desk-based jobs, a reliance on motorized transport, and limited access to recreational facilities (Islam et al., 2020; Khan et al., 2020).

**3.2 Urban stress and physiological consequences:** Through factors like job insecurity, financial strain, and social isolation, the competitive urban life generates chronic psychosocial stress. This, in turn, triggers a direct biological response by activating the body's sympathetic nervous system and Hypothalamic-Pituitary-Adrenal (HPA) axis. This prolonged activation can result in hypertension and encourages unhealthy coping behaviors (e.g., smoking, overeating), which are significant risk factors for CVDs (Steptoe & Kivimäki, 2012).

## Changing disease demographics and risk factors

### 1. Epidemiological transition:

Bangladesh has undergone a classic epidemiological shift, from a predominance of infectious diseases to a

current landscape dominated by NCDs (Rashid et al., 2019).

### 2. Rising burden of Non-communicable diseases:

NCD burden is marked by several key conditions:

**2.1 Hypertension:** Affecting 25-30% of the young urban adults, with significantly low rates of awareness and control (Huque & Sayeed, 2018).

**2.2 Obesity and Metabolic syndrome:** Central adiposity and metabolic syndrome are increasingly common, with a pooled prevalence of 30% among urban adults - significantly higher than in rural areas (Khanam et al., 2021).

**2.3 Dyslipidemia:** Atherogenic dyslipidemia is frequently observed due to modern diets and sedentary lifestyles, which lead to a specific lipid profile of high triglycerides, and low HDL-C (Berisha et al., 2025).

**2.4 Early onset of risk factors and disease:** In Bangladesh, CVDs present a critical threat due to their early onset; the average age of a first Myocardial infarction (MI) is in the mid-30s. This is nearly a decade younger than in Western nations, resulting in substantial losses to workforce productivity and economic stability (Yusuf et al., 2004).

### 3. Double burden of malnutrition:

Many young adults now face a "double burden" of malnutrition, having experienced undernutrition in childhood followed by obesity in adulthood. This trajectory significantly predisposes them to metabolic syndrome and CVDs later in life (Victoria et al., 2008).

### 4. Gender disparities:

Men tend to have a higher prevalence of smoking, while women face indoor air pollution due to traditional cooking practices (Sami & Sami, 2023). Urban males exhibit elevated rates of smoking and hypertension, while urban females have higher rates of physical inactivity and obesity, a pattern heavily influenced by socio-cultural norms (Lee et al., 2019).

### 5. Psychosocial and Economic aspects:

#### 5.1 Stress and Mental health:

Young urban populations face significant stress from academic pressure, job insecurity, and economic anxiety, which are linked to an increased risk of hypertension and arrhythmias (Chowdhury et al., 2018).

#### 5.2 Healthcare costs:

Excessive cost of managing CVDs can create a disastrous financial burden for young adults, potentially devastating both their own futures and the economic stability of their families (Rahman & Khan, 2020).

### 5.3 Productivity loss:

Early onset of CVDs costs Bangladesh's economy an estimated billion dollars each year in lost productivity from its younger workforce (Bloom et al., 2011).

## Economic fallout of a sick workforce

CVDs have been established as a clear threat not only to human health, but also to development and economic growth of the country.

### 1. Double burden on the healthcare system:

1.1 **High treatment costs:** Treating CVDs is very expensive because of long-term medicines, surgeries, and hospital stays.

1.2 **Hurts other health needs:** When the system is busy with these diseases, it is tough to take proper care for other's health issues.

### 2. Families face financial ruin:

2.1 **Medical bills cause poverty:** High cost of treating a heart attack or stroke can force a family to use up their savings, sell property, and go into deep debt.

2.2 **Loss of income:** If the main earner in a family becomes too sick to work or dies, it can push the entire household into long-term poverty.

### 3. Country loses productive workers:

3.1 **Loss of key workers:** People of the said age group are the core of workforce. When they get sick or die, economy loses its most important contributors.

3.2 **Reduced work output:** Even when employees with CVDs are at work, they are often less productive and need to take more sick days.

### 4. Whole country's economy suffers:

A less healthy population, being less productive, poses a major barrier to economic growth, especially for a developing country like Bangladesh.

### 5. Economy itself creates the problem:

Reasons for poor health are often linked to economic issues from unplanned urban growth:

5.1 **Fewer places to exercise:** Cities are so crowded and built up that there is little scope for parks.

5.2 **Awful air quality:** Pollution from traffic, construction, and industry makes people sick.

5.3 **Unhealthy food:** Many people eat unhealthy processed food because it's all they can afford.

## Health system challenges

1. **Lack of awareness:** A significant knowledge gap exists, as many young adults underestimate their personal risk/s for CVDs.

2. **Inadequate screening:** Lack of healthy screening programs means a majority of young adults remain undiagnosed until serious complications arise.

3. **Shortage of healthcare workers:** Existing Physician-to-Population ratio is considerably lower than international standards. Recommended Cardiologist-to-Population ratio is not met, making access to specialized care more challenging.

4. **Weak primary care:** Urban primary healthcare centers are often ill-equipped to manage and treat NCDs.

5. **Financial barriers to treatment:** High out-of-pocket costs for essential medications, such as antihypertensives and statins, severely limit patient adherence.

## Youth-specific data is notably lacking

### 1. Data overlooks youth-specific analysis:

Key sources of public health statistics, including the 2022 reports from the Bangladesh Bureau of Statistics (BBS), focus on aggregate figures. They report the overall percentage of deaths from heart attacks but do not disaggregate this data by age, making it impractical to analyze youth-specific risk.

### 2. Focus on broader demographics:

Other studies, like one on adolescent and young adult mortality from 2018-2022, focus on general causes of death in young people and may not specifically detail CVD mortality in that age bracket.

## CVDs impact on the achievements of Sustainable Development Goals

CVDs are the World's leading cause of morbidity and mortality. Their persistent impact, however, extends far beyond health statistics, posing an alarming and often underrecognized obstacle to global development. As a cross-cutting challenge, CVDs directly and indirectly threaten the achievement of SDGs (*THE 17 GOALS, Sustainable Development*. (n.d.-b). <https://sdgs.un.org/goals>).

**SDG 1 - No poverty:** CVDs pushes households into poverty via out-of-pocket treatment, lost wages, and long recoveries.

**SDG 2 - Zero hunger:** Urban diets high in salt, sugar, and trans-fat plus food deserts drive hypertension, obesity, and dyslipidemia.

**SDG 3 - Good health and well-being:** Primary health care screening, tobacco control, air-quality related illness reduction, essential medicines access, and mental health integration directly cut CVDs burden.

**SDG 4 - Quality education:** Health literacy and awareness programs in school and workplace on diet, physical activity, tobacco cessation, and stress changes lifelong behaviors and improves care-seeking among young adults.

**SDG 5 - Gender equality:** Young women's CVDs are under-recognized; biases in diagnosis and treatment and barriers to exercise in public spaces matter.

**SDG 6 - Clean water and sanitation:** While less direct for CVDs, WASH limits infection-related comorbidities and supports settings where physical activity is safe and feasible.

**SDG 7 - Affordable and clean energy:** Switching from solid fuels lowers household air pollution and reduces CVDs risk.

**SDG 8 - Decent work and economic growth:** Sedentary office work, long hours, and stress elevate risk; CVDs reduces productivity and GDP.

**SDG 9 - Industry, Innovation and Infrastructure:** NCDs response is strengthened by core components such as health tech, cardiac registries, and supply chains for essential drugs and diagnostics. In parallel, urban innovation plays a complementary role by embedding activity-friendly design to support preventive health.

**SDG 10 - Reduced inequalities:** Urban poor face higher exposure to cheap unhealthy foods, tobacco, pollution, and limited green space which increases CVD inequalities.

**SDG 11 - Sustainable cities and communities:** Mixed-use planning, sidewalks, cycling lanes, parks, safe public transport, and air-quality management enable activity and cut CVD risk.

**SDG 12 - Responsible consumption and production:** Food and beverage reformulation (salt, sugar, trans-fat elimination), clear labeling, and marketing controls reshape consumption patterns driving CVDs.

**SDG 13 - Climate action:** Heat waves and climate-driven air pollution worsen cardiovascular events; resilient health systems, heat-health action plans, and low-carbon transport deliver CVD co-benefits.

**SDG 14 - Life below water:** (Indirect) Marine food systems influence availability of heart-healthy proteins and fats; reducing plastic and chemical runoff safeguards food quality and long-term nutrition.

**SDG 15 - Life on land:** Urban greening, through increased tree cover and preserved natural areas, improves air quality, reduces heat islands, and promotes walking, all of which help prevent CVDs.

**SDG 16 - Peace, Justice and Strong institutions:** Effective governance is needed for tobacco taxation, trans-fat bans, urban planning codes, and insurance reimbursement policy enforcement underpins CVDs control.

**SDG 17 - Partnerships for the goals:** Multisector alliances health, urban development, transport, finance, food industry, civil society, academia are essential for surveillance, research, financing, and scalable interventions.

CVDs threaten sustainable development itself. By perpetuating poverty and stifling economic growth, they undermine the 2030 Agenda. The SDGs cannot be met without a global effort to curb CVDs, which is essential for a healthier and more prosperous future.

### Recommendations

Unplanned urbanization in Bangladesh is triggering a preventable public health crisis: a sharp increase in CVDs among young urban population. This environment promotes sedentary behaviors, unhealthy diets, and hazardous air pollution - key drivers of this epidemic. Addressing this crisis requires immediate, coordinated policy action targeting its urban roots:

1. **National policy level:** Implement WHO 'Best Buys' for NCDs, including taxation on sugar-sweetened beverages and unhealthy foods and mandatory trans-fat elimination.
2. **Urban planning:** Municipal policies should prioritize increasing public green spaces, developing pedestrian-friendly walkways, and dedicated cycling lanes to encourage physical activity. Air quality must be enhanced by implementing stricter controls on industrial emissions and promoting cleaner vehicle technologies.
3. **Healthcare system strengthening:** Healthcare system should implement regular screening for hypertension, obesity, diabetes, etc. It is crucial to educate primary healthcare providers on the latest guidelines for CVDs risk management and prevention.
4. **Health promotion and awareness:** Launch extensive public awareness campaigns using mass and social media to educate young adults on CVD risks and promote healthy lifestyles.
5. **Workplace wellness programs:** Workplace wellness initiatives should be established to promote

regular exercise, stress management and improve overall employee health.

6. **Socioeconomic measures:** Affordable and accessible health insurance plans should be introduced to reduce the financial barrier to care.

7. **Research:** Encourage longitudinal studies to better understand the trajectory of CVD risk in this demographic.

## Conclusion

Escalating epidemic of Cardiovascular diseases (CVDs) among the youth in urban Bangladesh poses a severe public health challenge and a significant impediment to national development. This trend, fueled by the effects of rapid, unplanned urbanization that encourages physical inactivity and poor nutrition, results in soaring healthcare expenditures, diminished productivity, and increased financial instability. Given the substantial socioeconomic costs, preventing and controlling CVDs has become an urgent developmental imperative for the 21st century.

Without a decisive, multi-sectoral response that moves beyond a purely medical model, the country risks widespread premature morbidity and mortality, undermining economic progress. Altering this trajectory requires an integrated strategy that addresses the socio-environmental roots of the crisis through coordinated action in urban planning, health promotion, and healthcare reform. Such sustained vigilance is crucial for building a prosperous future for Bangladesh.

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