

The urgent need for a policy on epidemiological data on cardiovascular diseases in Bangladesh

Amrin Yeasin Prama¹  | Proma Rani Das¹  | Sayma Akter¹  |
Syed Masudur Rahman Dewan^{1,2}  | Mohammad Safiqul Islam³ 

¹Department of Pharmacy, School of Medicine, University of Asia Pacific, Dhaka, Bangladesh

²Division of Pharmacology, Center for Life Sciences Research, Dhaka, Bangladesh

³Department of Pharmacy, Faculty of Science, Noakhali Science and Technology University, Noakhali, Bangladesh

Correspondence

Syed Masudur Rahman Dewan, Department of Pharmacy, School of Medicine, University of Asia Pacific, 74/A Green Road, Dhaka-1205, Bangladesh.
Email: gobeshok.d@gmail.com

Abstract

Background: Disease prevention and healthcare policy choices cannot be made without epidemiology data. Since it is a growing country with rapidly increasing illness rates, this information is in great demand in Bangladesh. This is because there is a shortage of reliable and sufficient data, leading to inadequate preventive and treatment methods.

Discussion: Poor health concerns and economic conditions mean that not all families can afford to provide the nutrition their members need, leading to an increase in the prevalence of many diseases. The outcome is an ever-increasing threat of cardiovascular disease (CVD) issues, the leading cause of death in Bangladesh, even though the underlying causes remain unknown. There is a strong demand for accurate information on CVD patients in Bangladesh, however, there is no effective framework for managing epidemiological data. This prevents an in-depth analysis of the nation's socioeconomic status, dietary practices, and way of life, as well as the implementation of sound healthcare policy.

Conclusion: In this article, we present arguments on this important issue using the healthcare systems of the developed world and Bangladesh as examples.

KEYWORDS

Bangladesh, cardiovascular diseases, cardiovascular disease prevalence, epidemiology, healthcare policy

1 | BACKGROUND

Noncommunicable diseases (NCDs) are exerting a growing impact on global health, necessitating global interventions.¹ Cardiovascular diseases (CVDs) are one of the NCDs that are the leading cause of mortality worldwide. There are various ailments of the blood vessels and heart. Numerous complications can arise, such as cerebrovascular disease (stroke), heart attack, rheumatic heart disease, congenital heart disease, arterial thrombosis, and pulmonary embolism.

In 2019, an estimated 17.9 million fatalities occurred, accounting for 32% of all deaths globally. As was previously indicated, among the CVDs and the total number of fatalities, heart attacks and strokes accounted for 85%. More than three-quarters of all fatalities from CVD and stroke occur in low- and middle-income nations.² Epidemiology, as everyone knows, is the study of disease prevalence and its causes across populations. The implementation and extrapolation of disease prevention measures, as well as the care of individuals with early-onset illness, require epidemiological data.^{3,4}

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Particularly in the regions, data on the prevalence and persistence of CVD hazards to men and women is relatively scarce.⁴ The dilemma of collecting and storing information on CVD epidemiology affects every country, including Bangladesh. Chronic CVDs have several causes. They reflect the fundamental dynamics, such as globalization and urbanization, that are propelling social, economic, and strategic transformation. Merely stress, poverty, and genetics remain independent factors in the development of CVD. Most CVDs may be avoided by keeping an eye on modifiable lifestyle habits including smoking, not getting enough exercise, eating poorly, and carrying excess weight. Therefore, early detection of CVDs is critical for facilitating timely control, counseling, and treatment.²

2 | CVD-CAUSING SCENARIO IN BANGLADESH

The News Daily's worldwide platform data on NCDs shows that CVDs account for 34% of fatalities in the country. There appear to be no statistical surveys or studies on the exact number of persons afflicted by this, or the number of people dying from it or at risk.⁵ Bangladesh has emerged as a developing nation after experiencing rapid economic expansion in the preceding decades, during which time the country experienced a period of accelerated civilization. Due to the sedentary lifestyles that become the norm as a result of growth and urbanization (changes in eating habits, such as the increased availability and demand for processed food and the inappropriate timing of meals), the prevalence of cardiac disorders is thought to rise.⁶ Atherosclerosis and coronary artery disease (CAD) have a strong dietary influence.⁷ People's dietary habits and the prevalence of obesity are affected by the food environment,⁸ which in turn contributes to the incidence of CVDs. For example, we may sample the distinctive cuisines of the picky Gulshan, Banani, and Mohammadpur neighborhoods right in the narrow streets of Dhaka's old area.⁹ The popularity of street cuisine has spread beyond urban regions and into more rural communities. The result is a slow but steady decline in the average lifespan in developed countries too.

3 | IMPORTANCE OF CVD EPIDEMIOLOGICAL DATA

The field of research known as epidemiology investigates the frequency and causes of disease across populations. We use epidemiological data for both disease prevention and the treatment of patients who have already been affected by diseases. The epidemiology of a disease is an essential aspect of its fundamental description, just as the clinical symptoms and pathology are. Data gathering and interpretation in this field require unique methods and a specialized terminology. People might wonder what statistics can teach us about CVD. The significance of the information lies in its potential to provide light on the origins and course of the disease and to inform therapeutic choices.

Developed countries like Japan and the United States are often held up as models of how a nation should provide high-quality healthcare to its citizens. The United States' one of the biggest causes of mortality is heart disease, as reported by the Centers for Disease Control and Prevention.¹⁰ With the aid of many tools and approaches needed to maintain epidemiological data, this CVD was impressively controlled. The following details could serve as an illustration of this: according to respondents, heart disease prevalence among adults in the United States who are 18 and older varied by age group from 2009 to 2019. It was seen that heart disease prevalence declined in individuals aged 55–64 (0.3%) and 65–74 (0.4%) from 2009 to 2018. Another respondent's report on heart disease frequency among adults in the United States, aged 18 and older, by sex, from 2009 to 2019 shows that: Men were more likely than women to have heart disease between 2009 and 2019. Men had a lower age-adjusted prevalence of cardiac disease in 2009, they reported having heart disease at a rate of 8.3%; in 2019, that rate had dropped to 7.0%. In 2019, there were 4.2% fewer women with heart disease than there were in 2009 when the age-adjusted prevalence was 4.6%. The above scenario depicts teams of cardiologists, heart surgeons, advanced practitioners, nurses, and healthcare workers combining their comprehensive understanding of academic medicine and revolutionary clinical care to create treatments that are specifically tailored to the conditions of each patient. Consequently, developments in medical care and a decline in heart disease risk factors, such as high blood pressure, high cholesterol, smoking, and obesity, have resulted in a decrease in heart disease mortality and morbidity.¹¹ For the prevalence, the risk matrix, decision tree, failure modes, and effects analysis (FMEA), and bowtie model are the four commonly used risk assessment methods by the country.¹² The epidemiological data presented herein offer a distinct justification for the proximal risk factors and wider determinants that require attention in prevention initiatives. Furthermore, the data provide compelling evidence that reducing these factors resulted in a decrease in the incidence of CVD.¹³ This image highlights the urgency for epidemiological data management and policy development in various nations such as Bangladesh, to mitigate the spread of NCDs, like CVDs and implement effective measures for their control.

Japan experienced a notable decline in mortality rates for stroke and ischemic heart disease from the 1960s to the 2000s. The decline in disease prevalence contributed to Japan's high ranking in global life expectancy, as reported in a recent study.¹⁴ According to NIPPON DATA (National Integrated Project for Prospective Observation of Noncommunicable Disease and its Trends in the Elderly), data from JCARE-CARD (Japanese Cardiac Registry of Heart Failure in Cardiology), a countrywide observational study, showed that the rate of HFpEF (Heart failure with preserved ejection fraction) has increased to about 30% among patients with HF in Japan.¹⁵ In 2010, the prevalence of hypertension in men and women remained high at 62% and 48%, respectively; the prevalence was lower in those hypertensive people who took their medications as prescribed, at 32% and 40%, respectively, later on. Proper documentation (collecting and analyzing data of the types of disease, reasons, regions,

lifestyle, etc.) and developing and implementing healthcare management policies are the reasons behind this improvement. Cerebrovascular and CVDs account for approximately 20% of total medical costs when classified by injury or illness.¹⁶ A study conducted in Arita-Cho, Saga Prefecture, Japan, has demonstrated one of the methods for establishing epidemiological data: the usefulness of plasma B-type natriuretic peptide (BNP) as a biological marker for predicting the 10-year risk of CAD. The study's guidelines have facilitated the incorporation of this data into an annual health maintenance check for cardiovascular risks in households. As a consequence of establishing the CVD data policies compared to other locations, medical care became less expensive in Arita-cho. Which also illustrates a trend in the development of healthcare management systems based on the epidemiological data in that region. Though the absolute values were lower than in Japan, this rising incidence was also seen in China. In reality, 26.6% of Chinese people had hypertension between 2007 and 2008, with a greater prevalence in men and women at 29.2% and 24.1%, respectively, compared to 20% and 17%, respectively, in 2002.¹⁷ A community-based stroke prevention program serves as an example of how a combination of public health and personalized treatment activities to improve balanced diets, smoking cessation, sodium reduction, and smoking prevention have helped to lower the incidence of CVDs.¹⁴ To enhance health and epidemiological data, Japan passed the Cerebrovascular and Cardiovascular Disease Control Act. The Ministry of Health, Labour, and Welfare of Japan created the Japanese National Plan for Promotion of Measures Against Cerebrovascular and Cardiovascular Disease in compliance with the Act. The Council includes academics, emergency services, health, welfare, and JCARE-CARD for cerebrovascular or CVD patients. The Japanese National Plan considers patients, stakeholders, and medical professionals for the policy on epidemiological data. Patients should follow the instructions and ensure promotions meet plan goals.¹⁶ Bangladesh may avoid infectious and noninfectious diseases by using epidemiological data and understanding their causes, as shown above. Epidemiological data may be determined using 'data mining', which uses artificial intelligence, pattern recognition, and statistics to find unexpected information.¹⁸ It also assesses a disease's population-level progression, which aids resource allocation and decision-making.¹⁹

Besides, a key feature of epidemiology is the measurement of disease outcomes in relation to a population at risk. The population at risk is the group of people, healthy or sick, who would be counted as cases if they had the disease being studied. In this case, for example, if a general practitioner were measuring how often patients consult him about CVD, the population at risk would comprise those people on his list (and perhaps also of his colleagues) who might see him about a CVD problem if they had one. Patients who, though still on the list, had moved to another area would not consult that doctor. They would therefore not belong to the population at risk.

Thus, they may face urgent public health issues that are manageable. Aside from avoiding contaminated food products, recommending antibiotic prophylaxis or vaccinations, and isolating

an infectious person, they can also take effective and necessary measures to control the severity of the disease.²⁰ Clinical data (such as the number of patients seen) alone cannot be used to infer epidemiological (risk) conclusions. Understanding the current epidemiologic status of CVD is crucial to prevent its harmful consequences on public health in Asian nations by coordinating government and public health organizations at the national level with more strong plans and actions.²¹ In light of these criteria, it can be asserted that the availability of epidemiological data in Bangladesh will aid in the treatment of a wide variety of medical conditions caused by CVDs (cross-sectional surveys), the investigation of their possible causes (case-control and cohort studies), and the evaluation of the efficacy, effectiveness, efficiency, and fairness of suggested interventions (controlled trials).²²

4 | DISCUSSION AND RECOMMENDATIONS

The US health maintenance organization, the Center for Disease Control and Prevention (CDC), calculates, monitors, and makes epidemiological data laws and regulations. Likewise, Bangladesh requires training, competent and experienced authorities, and administration to measure these factors. However, undeveloped, or impoverished nations may struggle financially to adopt these activities. This issue raises a lot of concerns such as:

- (a) How many people are harmed by CVD each year?
- (b) How many people with this sickness are getting better?
- (c) Out of all the different treatments, which one works best?
- (d) How many people die each year?
- (e) Which CVD is the most dangerous?
- (f) What kind of CVD has the biggest effect on people?
- (g) The total number of times it has happened in history.
- (h) The number of people who have the disease at a certain time.
- (i) How many people are hospitalized and how many people die
- (j) Social and economic factors
- (k) Way of life, such as eating habits
- (l) The link between CVDs and other diseases
- (m) Do the current plans for healthcare work?
- (n) Are the rules being followed correctly?
- (o) What are the problems that need to be fixed?

The Bangladeshi healthcare management system lacks proper epidemiological data management to address many more issues and concerns about this deadly disease. Thus, the number of people with CVD is going up every day, and it is getting harder to fight the disease because prevention and treatment methods are not working. Proper healthcare policy from the government, skilled, competent, and accountable people must address these challenges. Thus, the authority may readily access disease data, diagnosis, and issues. A central database can simplify epidemiologic data collection. Patients may have medical cards with barcodes or identities. After scanning the barcode, a

hospital doctor receives general medical history and prescriptions. During the SARS-CoV-2 pandemic, Bangladesh set up a mobile application called “Surokkha,” a module,²³ to track COVID-19 in Bangladesh. Thus, the government can handle other dangerous illnesses if they manage COVID-19. Using COVID-19 as an example, Bangladesh can effectively obtain prevalence data for additional dangerous illnesses. A public domain suite of congruent data collecting, questionnaire creation, data input, and analysis software may also be created. “Epi InfoTM” is an open-source, interoperable software toolkit for public health professionals and researchers. It offers a simple data input form and database development, a tailored data entry experience, and data analytics using CDC epidemiologic statistics, maps, and graphs.²⁰ Similarly, “Remedy Portals” might provide the national call center’s number and the Institute of Epidemiology Disease Control And Research (IEDCR)’s (an organization in Bangladesh like CDC) contact information in Bangladesh. Its benefits include simple contact with chronically sick patients, accurate and exact patient information, empowerment, and care ownership.

The Bangladeshi government should allocate a budget for the development of the discussed issues. Qualified individuals and the surrounding environment may show self-interest in this sector. Survey research in Bangladesh is typically conducted in small groups. As previously mentioned, depending on the World Health Organization (WHO). However, it fails to provide a comprehensive depiction of the epidemiological situation in a nation. Epidemiological data collection confers several benefits to a nation. There is a global need for timely collection of epidemiological data on general, communicable, and NCDs. Such data analysis can aid in understanding various diseases. Stakeholders, including the government, nongovernment organizations, and healthcare professionals, should prioritize the development of treatment availability, plans, strategies, and epidemiological data. Therefore, it can enhance a country’s research sector. The Bangladeshi government should allocate a budget to address the issue. Qualified individuals and the environment will be self-interested in this sector. Survey research in Bangladesh is often limited in scope and lacks adequate monitoring.

5 | CONCLUSION

There is a global need for timely collection of epidemiological data on general, communicable, and NCDs. Raising public awareness can facilitate data curation. Various organizations such as WHO, UNICEF, World Bank or others can contribute to a country’s healthcare system development by financing and implementing epidemiological data collection policies and tools. The government should oversee the appropriate execution of data management. Accurate and thorough epidemiological data on both communicable and NCDs is crucial for promoting public health and well-being, particularly in developing and underdeveloped nations.

AUTHOR CONTRIBUTIONS

Amrin Yeasin Proma: Conceptualization; Writing—original draft. **Proma Rani Das:** Conceptualization; Writing—original draft. **Sayma Akter:**

Conceptualization; Writing—original draft. **Syed Masudur Rahman Dewan:** Conceptualization; Supervision; Writing—original draft; Writing—review & editing. **Mohammad Safiqul Islam:** Resources.

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“Mohammad Safiqul Islam” is an Editorial Board member of Health Science Reports, and a co-author of this article. To minimize bias, he was excluded from all editorial decision-making related to the acceptance of this article for publication.

DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

TRANSPARENCY STATEMENT

The lead author Syed Masudur Rahman Dewan affirms that this manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

ORCID

Amrin Yeasin Proma  <http://orcid.org/0009-0006-1357-6027>

Proma Rani Das  <http://orcid.org/0009-0001-8867-7918>

Sayma Akter  <http://orcid.org/0009-0009-2285-8730>

Syed Masudur Rahman Dewan  <http://orcid.org/0000-0003-1443-7150>

Mohammad Safiqul Islam  <http://orcid.org/0000-0003-4924-5319>

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