



# Alteration of the non-communicable disease risk factors prevalence over eight years in Bangladesh: a comparison of STEPS survey 2010 and 2018

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**Abstract:** The World Health Organization (WHO) launched the STEP-wise method to surveillance (STEPS) in 2002 after realizing the need for risk-factors (RFs) data on important non-communicable disease (NCD) risk factors on a global scale. The goal of this study was to assess changes in RFs occurrence over time by comparing the prevalence of RFs reported by the Bangladesh NCD Risk Factor Survey between 2010 and 2018. It was a simple comparative review. We reviewed both the STEPS survey of 2010 and 2018. Both of these surveys studied common NCD risk factors following the WHO standardised protocol, and they are nationally representative. However, the 2010 survey followed STEP 1 and 2, but the 2018 survey included all three steps. In terms of tobacco use, there was a general decline in prevalence in 2018. Alcohol consumption increased over time, and lifetime drinkers increased up to 4.2%. Conversely, fruit and vegetable intake (FAV) consumption increased up to 6.1%. The low level of physical activity (PA) increased up to 14.7% in 2018. Generalized obesity [body mass index (BMI)  $\geq 25$  kg/m<sup>2</sup>] increased 7.2%. Hypertension prevalence increased up to 3.1% in 2018. The prevalence of diabetes increased about two-fold in 2018. Sex-wise alteration showed NCD risk factors have a more increasing trend in the case of women than men. Despite having fewer communication and health education resources, residence analysis revealed that rural residents' behavioral RF patterns were on the decline relative to urban residents. But the concerning fact is that, from 2010 to 2018, all RFs, with the exception of a small number (tobacco use, PA level, and FAV intake), have increased. With the exception in few factors, the bulk of NCD risk factors displayed an upward trend in prevalence. Although the simple comparison of two nationally representative surveys showed a significant difference in RFs, migration and population aging may be to blame for the shifts in risk factor levels. Each of these issues needs to be properly securitized. Planning and taking action that are effective and timely should be promoted in order to reduce RFs at the population level.

**Keywords:** World Health Organization STEP-wise method to surveillance (WHO STEPS); non-communicable disease (NCD); non-communicable disease risk factors (NCD risk factors); Bangladesh

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## Introduction

Non-communicable diseases (NCDs) are highly preventable, but they will create much more socioeconomic and health consequences until and unless they are not adequately addressed and prioritized (1). Each year 41 million deaths are caused by NCDs, and 15 million people die at the age between 30 and 69, termed premature deaths (2). Above 85% of these “premature” demises happen in low- and middle-income countries (LMICs) (2). Unswerving globalization and expeditious unprompted urbanization serve as conduits for the promotion of detrimental lifestyles and environmental changes. Few common risk factors like tobacco use, unhealthy diet, and inadequate physical activity give rise to intermediate-risk factors such as raised blood pressure (BP), raised blood glucose, unfavorable lipid profiles, obesity, and impaired lung function. In turn, the intermediate-risk factors predispose individuals to the “fatal four”—cardiovascular disease (heart disease and stroke), cancer, chronic respiratory disease, and diabetes. Regardless of the financial advancement parameter, NCD risk factors and their related disability burdens are almost common worldwide. Recognizing a global need for risk-factor data on these key NCD risk factors, WHO initiated the STEP-wise approach to surveillance (STEPS) in 2002. The key goals of STEPS are to monitor the formation of risk-factor surveillance structures in different countries by establishing an outline and tactic; to reinforce the accessibility of data. WHO also aimed to benefit the countries to notify, observe, and evaluate their strategies and actions; to expedite the advancement of population profiles of NCD risk-factor revelations; to support and design comparability across populations and from time to time; and to build human and institutional capacity for NCD surveillance (3,4). NCD deaths are more than 67% in Bangladesh. NCD risk factors are also prevalent in the Bangladeshi population in both rural and urban areas regardless of age and gender. These risk factors control is less costly than treating the total NCDs (5). Therefore, the risk factor approach of NCD prevention has become successful in many countries (6). A standardized approach, popularly known as STEPS, is being promoted by the World Health Organization for understanding the risk factors distribution in a population (1). STEPS is a homogenous standardized structure for observing the extent and amount of NCD risk factors in a country developed by WHO. STEPS-wise approach comprises three steps; STEP 1 determines behavioral risk factors by questionnaire assessment, STEP 2 determines

anthropometric risk factors by physical measurements, STEP 3 finds out biochemical risk factors by biochemical measurements (3). Bangladesh has conducted national STEPS surveys in 2002 and 2010, and a subnational STEPS survey (Dhaka, Chittagong, and Rajshahi) in 2006 and most recently in 2018 where all the three steps were used for the first time. Our objective was to compare STEPS 2018 and STEPS 2010 in order to determine how risk factors change over time, to discuss the benefits and drawbacks of each STEPS surveillance system, and to highlight potential future directions that may be more effective in influencing policymakers to make improvements.

## Methods

We reviewed two NCD risk factor surveys held in 2010 and 2018 in Bangladesh. It was a simple comparison. About 9,275 individuals aged 25 years or older were randomly drawn from all over the country in the 2010 survey. Anthropometric parameters like height, weight, waist circumference were measured. BP was measured with standard procedures and information on diet, physical activity, tobacco and alcohol, and treatment history for hypertension and diabetes were collected (7). In 2018, a cross-sectional survey was carried out from September 2017 to June 2018 among adult populations aged 18–69 years, including men and women residing in all the divisions of Bangladesh. Sampling was done by a multistage, geographically stratified probability-based technique based on the Primary Sampling Unit (PSU) developed by the Bangladesh Bureau of Statistics (BBS). Finally, Behavioral data were collected from 8,185 respondents, Anthropometric data were collected from 7,208 respondents, and (biochemical information, i.e., blood and urine samples) were collected from 7,056 respondents. Both the blood and urine samples were collected from 6,901 respondents (8).

Common NCD risk factors were studied at both these surveys using the standardized questionnaire with a slight adaptation of the WHO STEP wise Surveillance (STEPS) questionnaire. Assimilation of all the core variables along with some expanded variables from step 1 was used in 2010 (7). Standardized physical measurements (height, weight, waist circumference, and BP) were incorporated from step 2 (7). But In 2018, all the three steps (step 1, step 2, and step 3) and their core variables aside with expanded variables were studied (8). In our study, common variables

**Table 1** Comparison of various risk factors of STEPS survey 2010 and 2018

Risk factors	STEPS 2010 (7) (%)	STEPS 2018 (8) (%)	Difference (%)
Tobacco smoking			
Current smoker	26.2	23.5	↓2.7
Current SLT user	31.7	27.5	↓4.2
Any form tobacco users	51.0	43.7	↓7.3
Fruit and vegetable intake			
Adequate fruits and or vegetables (≥5 servings/day)	4.3	10.4	↑6.1
PA			
Low level of PA	27.0*	12.3**	–
High level of PA	73*	71.8**	–
Alcohol intake behavior			
Lifetime abstainers	95.6	91.4	↓4.2
Lifetime drinker	4.4	8.6	↑4.2
Obesity			
Generalized obesity (BMI ≥25 kg/m <sup>2</sup> )	17.9	25.9	↑8.0
Central obesity (WC)	8.9 <sup>†</sup>	10.9 <sup>‡</sup>	↑2.0
Hypertension			
HTN (SBP/DBP: 140/90 mmHg or on medication)	17.9	21.0	↑3.1
DM			
Prevalence of DM	3.9 <sup>‡</sup>	5.1 <sup>‡</sup>	↑1.2

\*, followed the metabolic equivalent of task (MET) formula for detecting PA; \*\*, followed <150 min/week for detecting low PA; so, comparison is not possible; <sup>†</sup>, waist circumference >88 cm for women, >102 cm for men; <sup>‡</sup>, self-reported. STEPS, STEP-wise approach to NCD risk factor surveillance; SLT, smokeless tobacco; PA, physical activity; BMI, body mass index; WC, waist circumference; HTN, hypertension; SBP, systolic blood pressure; DBP, diastolic blood pressure; DM, diabetes mellitus; NCD, non-communicable disease.

used in both the survey were the focus of interest and comparison.

## Results

Comparing NCD risk factor survey 2010 to 2018, *Table 1* shows that any form of tobacco users decreases about 7.3%. Current tobacco users and current SLT users decreased 2.7% and 4.2% respectively. Adequate fruits and or vegetable intake (≥5 servings/day) increased by 6.1% in 2018. Insufficient physical activity level was 12.3% in 2018 and 27% in 2010 (MET calculation used in 2010 and 2018 STEPS followed <150 min/week for detecting low PA). Lifetime abstainers of alcohol decreased up to 4.2% in 2018. On the other side, lifetime (Current) drinkers also

increased. Generalized obesity [body mass index (BMI) ≥25 kg/m<sup>2</sup>] grew by 8.0%, and central obesity (measured by waist circumference) by 2%, however we are unable to fully compare central obesity due to the differing cut-off values between the surveys conducted in 2010 and 2018 for this condition. Hypertension (SBP/DBP: 140/90 mmHg) prevalence increased 3.1% at 2018. Prevalence of diabetes increased about two-fold in 2018 provided that 2010 was only self-reported, but both self-reporting and blood glucose measurement was done in 2018.

Sex wise alteration of NCD risk factor showed that all forms of tobacco smoking were declined for both sexes. For men, 10.4% decreases occur in case of any form of tobacco use and it is highest among both sex. Adequate (≥5 servings per day) fruits and vegetable intake also increased irrespective

**Table 2** Sex wise comparison of various risk factors of STEPS survey 2010 and 2018

Risk factors	Man			Woman		
	2010 (%)	2018 (%)	Difference (%)	2010 (%)	2018 (%)	Difference (%)
<b>Tobacco smoking</b>						
Current smoker	54.8	46.4	↓8.4	1.3	1	↓0.3
Current SLT user	29.4	26.9	↓2.5	33.6	28.1	↓5.5
Any form tobacco users	70	59.6	↓10.4	34.4	28.3	↓6.1
<b>Fruit and vegetable intake</b>						
Adequate fruits and or vegetables (≥5 servings/day)	3.1	10.1	↑7	5.3	10.7	↑5.4
<b>PA</b>						
Low level of PA	10.5*	9.6**	↓0.9	41.3*	14.8**	↓26.5
<b>Alcohol intake behavior</b>						
Current drinker (alcohol in past 30 days)	1.5	2.9	↑1.4	0.1	0.0	–
<b>BMI (kg/m<sup>2</sup>)</b>						
Overweight (BMI 25.0–29.9)	11.1	16	↑4.9	17	25.1	↑8.1
Obesity (BMI ≥30.0)	2.2	2.3	↑0.1	4.9	8.6	↑3.7
<b>Blood pressure</b>						
Raised blood pressure (SBP/DBP: 140/90 mmHg or on medication)	18.5	17.9	↓0.6	17.4	24.1	↑6.7
<b>Diabetes mellitus</b>						
Prevalence of DM	3.6 <sup>‡</sup>	8.9 <sup>‡</sup>	↑5.3	4.3 <sup>‡</sup>	7.9 <sup>‡</sup>	↑3.6

\*, followed the metabolic equivalent of task (MET) formula for detecting PA; \*\*, followed <150 min/week for detecting low PA; †, self-reported; ‡, measurement done. STEPS, STEP-wise approach to NCD risk factor surveillance; SLT, smokeless tobacco; PA, physical activity; BMI, body mass index; SBP, systolic blood pressure; DBP, diastolic blood pressure; DM, diabetes mellitus; NCD, non-communicable disease.

of sex but it is highest in the case of the men and it is about 7% increase in 2018 from 2010 (*Table 2*).

Although physical activity measurement procedures were different in the two surveys, a dramatic change has occurred in the case of women. Almost 26.5% decrease was observed in low PA level for women from 2010 to 2018. Current drinker of alcohol (consumed within 30 days) was increased in the case of men (1.4%). Overweight and obesity prevalence was in increasing trend in both sex. But prevalence showed a great increase for women (overweight increased 8.1%, obesity 3.7%). Raised BP was predominant for women (6.7% increased) in 2018 from 2010. Diabetes mellitus showed an increasing trend for men (5.3% increased). Overall, women were more exposed to NCD risk factors than men (*Table 2*).

Residence-wise distribution of NCD risk factors showed

a decreasing trend of risk factors that were dominant for tobacco smoking, low PA level, and FAV intake. Alcohol intake behavior and obesity/overweight prevalence were more in the case rural population in 2018 from 2010. BP and diabetes mellitus prevalence were also in increasing trend from 2010 to 2018, but these two showed an increasing trend for an urban population (BP prevalence increased 5.3%, DM increased 7.4%). Although rural populations are deprived of enough health education and communication facilities trend of NCD risk factors, particularly behavioral risk factors were decreasing more in the case of rural people (*Table 3*).

One of the challenges to compare both reviews was age group difference. In the 2010 survey, it was started from 25 years and there was no age limit at the upper level. But the 2018 survey included all whose age was within 18–69 years.

**Table 3** Residence wise comparison of various risk factors of STEPS survey 2010 and 2018

Risk factors	Urban			Rural		
	2010 (%)	2018 (%)	Difference (%)	2010 (%)	2018 (%)	Difference (%)
<b>Tobacco smoking</b>						
Current smoker	24.9	22.6	↓2.3	27.2	23.7	↓3.5
Current SLT user	30.8	21.8	↓9	35.1	29.1	↓6
Any form tobacco users	46.5	38.8	↓7.7	55.5	45.2	↓10.3
<b>Fruit and vegetable intake</b>						
Inadequate fruits and or vegetables (<5 servings/day)	95.7	92.1	↓3.6	95.7	89.3	↓6.4
<b>PA</b>						
Low level of PA	28.9*	14.2**	↓14.7	25.1*	11.7**	↓13.4
<b>Alcohol intake behavior</b>						
Current drinker (consumed alcohol in past 30 days)	1.2	1.8	↑0.6	0.7	1.4	↑0.7
<b>Overweight and obesity</b>						
Overweight/obese (BMI ≥25)	25.1	34.3	↑9.2	10.2	23.5	↑13.3
Central obesity	29.6 <sup>¥</sup>	36.2 <sup>‡</sup>	↑6.6	13.9 <sup>¥</sup>	25.4 <sup>‡</sup>	↑11.5
<b>Blood pressure</b>						
Raised blood pressure (blood pressure ≥140/90 mmHg or drug treatment)	19.9	25.2	↑5.3	15.9	19.8	↑3.9
<b>Diabetes mellitus</b>						
Prevalence of DM	5.8 <sup>‡</sup>	13.2 <sup>‡</sup>	↑7.4	2.1 <sup>‡</sup>	7.1 <sup>‡</sup>	↑5

\*, followed the MET formula for detecting PA; \*\*, followed <150 min/week for detecting low PA; ¥, increased waist circumference (men ≥94 cm, women ≥80 cm); ‡, women >80 cm, men >90 cm; †, self-reported; †, measurement done. STEPS, STEP-wise approach to NCD risk factor surveillance; SLT, smokeless tobacco; PA, physical activity; BMI, body mass index; DM, diabetes mellitus; MET, metabolic equivalent of task; NCD, non-communicable disease.

Although it was a fact there was a common age group of 25–54 years. We found risk factors distribution was more prevalent in that group.

If we compare the tobacco consumption status, we found it as declining from 2010 to 2018, but in the common age group of 25–54 years, it was not decreased. So, we can say that these groups are more exposed to tobacco consumption, and we should focus more on that group. Not only for tobacco smoking, are all types of risk factors prevalent in that group except fruits and vegetable intake and physical activity level (Table 4).

We also attempted to compare the South East Asian region's historical NCD risk factor status (Table 5). Although some measurement methods varied at the country level, these statistics can still be used to forecast how our country will fare in comparison to those other nations.

## Discussion

To see the frequency and changes of typical NCD risk variables, we attempted to compare the STEPS survey from 2010 and 2018 to each other. The cut-off value or a few factors, however, did not always match the measuring technique. This comparison helps us understand how risk factors change over time. Along with these two STEPS comparisons, we also made an effort to evaluate the prevalence of risk factors across the South East Asian region, which was studied before on individual nations. The most recent STEPS survey was undertaken in Buthan in 2014, Nepal in 2013, Sri Lanka in 2015, the Maldives in 2011, Timor Leste in 2014, Myanmar in 2014, and Indonesia in 2003. We did not include Korea's risk factor percentages among the ten nations since their fact sheet

**Table 4** Differences of risk factors in common age group (25–54 years) of STEPS survey 2010 and 2018

Risk factors	STEPS 2010 (%)	STEPS 2018 (%)	Increased ↑ or decreased ↓
Tobacco smoking			
Current smoker	20.5	25.2	↑
Current SLT user	22.8	31.9	↑
Any form tobacco users	38.3	48.9	↑
Fruit and vegetable intake			
Inadequate fruits and or vegetables (<5 servings/day)	95.3	89.2	↓
Adequate fruits and or vegetables (≥5 servings/day)	4.7	10.8	↑
PA			
Low level of PA	25.8*	10.1**	↓
Alcohol intake behavior			
Lifetime abstainers	94.3	91.5	↓
Current drinker (drank in past 30 days)	1.0	1.3	↑
Obesity			
Generalized obesity (BMI ≥25 kg/m <sup>2</sup> )	18.9	23.4	↑
Obese (BMI ≥30.0 kg/m <sup>2</sup> )	3.9	6.7	↑
Hypertension			
HTN (SBP/DBP: 140/90 mmHg or on medication)	17.3	27.6	↑
Diabetes mellitus			
Prevalence of DM	3.1 <sup>‡</sup>	10.3 <sup>‡</sup>	↑

\*, followed the metabolic equivalent of task (MET) formula for detecting PA; \*\*, followed <150 min/week for detecting low PA; †, self-reported; ‡, measurement done. STEPS, STEP-wise approach to NCD risk factor surveillance; SLT, smokeless tobacco; PA, physical activity; BMI, body mass index; HTN, hypertension; SBP, systolic blood pressure; DBP, diastolic blood pressure; DM, diabetes mellitus; NCD, non-communicable disease.

was not full. Kerala (Urban) was excluded from India since state-specific survey methods and percentages are used there.

### ***Tobacco smoking***

In Bangladesh, there is an overall decline in tobacco use from 2010 to 2018. A decrease was observed in case of sex difference and also irrespective of urban or rural residence. WHO provides the technical support for implementing the FCTC and tobacco control, especially in the key areas of tobacco taxation, policy development, enforcement of legislation, and surveillance of tobacco use. Therefore, it is recognized as an essential component of the Sustainable Development Goals (Target 3.a); WHO will endure offering supports to the government to achieve the vision

of a tobacco-free Bangladesh by 2040. Despite the overall decline in tobacco use, Bangladesh continues to have a high rate of consumption, according to the most recent STEPS study of all South East Asian nations, with the exception of Timor-Leste (56.1%). Therefore, the government should concentrate more on enforcing tobacco control laws and raising public awareness about tobacco use.

### ***Alcohol intake***

Alcohol use in Bangladesh is comparatively low. However, due to uniaxial globalization, day by day, it is increasing. Proper alcohol consumption habits can be unmasked as Bangladesh is a Muslim country where alcohol consumption is legally prohibited. So, there is a chance of bias. Alcohol use is prevalent among men, younger age

**Table 5** Review of the prevalence of different risk factors of South-East Asian Regional countries

Country	Tobacco smoking <sup>1</sup>	Alcohol intake <sup>2</sup>	Fruits and vegetables intake <sup>3</sup>	Physical activity <sup>4</sup>	Overweight (BMI $\geq 25$ kg/m <sup>2</sup> ) <sup>5</sup>	Obese (BMI $\geq 30$ kg/m <sup>2</sup> ) <sup>6</sup>	HTN <sup>7</sup>	DM <sup>8</sup>
Bangladesh [2018]	43.7	92.4	89.6	–	20.3	5.5	21.0	8.3
Bhutan [2014]	24.8	39.0	66.9	48.8	33.0	6.2	35.7	6.4
Nepal [2013]	18.5	73.5	98.9	53.6	21.6	4.0	25.7	3.6
Sri Lanka [2015]	15	67.9	72.5	73.6	29.3	5.9	26.1	7.4
Timor-Leste [2014]	56.1	57.7	77.5	52.4	11.2	0.9	39.3	1.5
Maldives [2011]	18.8	96.2	93.6	73.8	37.1	11.5	16.6	–
Myanmar [2014]	26.1	68.8	86.6	74.5	22.4	5.5	26.4	5.9
Indonesia [2003]	18.4	96.9	87.2	–	35.2	7.8	8.6	5.3
India (Kerala-Urban 2007-8)	13.3	78.6	87.3	75.8	–	–	–	–

Year of last STEPS survey conduction is placed within the square bracket. <sup>1</sup>, percentage who currently consume tobacco in any form; <sup>2</sup>, percentage who are lifetime abstainers; <sup>3</sup>, percentage who eat <5 servings of fruits and/or vegetables on average per day; <sup>4</sup>, percentage not engaging in vigorous activity; <sup>5</sup>, percentage who are overweight (BMI  $\geq 25$  kg/m<sup>2</sup>); <sup>6</sup>, percentage who are obese (BMI  $\geq 30$  kg/m<sup>2</sup>); <sup>7</sup>, percentage with raised BP (SBP  $\geq 140$  and/or DBP  $\geq 90$  mmHg or currently on medication for raised BP); <sup>8</sup>, percentage with raised fasting blood glucose as defined below or currently on medication for raised blood glucose [plasma venous value  $\geq 7.0$  mmol/L (126 mg/dL)]. BMI, body mass index; HTN, hypertension; DM, diabetes mellitus; STEPS, STEP-wise approach to NCD risk factor surveillance; BP, blood pressure; SBP, systolic blood pressure; DBP, diastolic blood pressure.

groups, laborers, salaried government and non-government employees, businessmen, current smokers, and those with low educational background. Both men and women are getting more exposed to alcohol day by day regardless of their lining state. Policymakers should come forward with new interventions to control the other growing trend of consumption. Though alcohol consumption is far low compared to neighboring countries (except Maldives and Indonesia), lifetime drinkers increased up to 4.2% from the 2010 survey. Both men and women are getting more exposed to it day by day regardless of their lining state. Policymakers should come forward with new interventions to control the other growing trend of consumption.

### *Fruits and vegetable intake*

In the case of fruits and vegetable intake, especially fruit intake is deficient in the Bangladeshi adult population. However, the situation is little improved because of education and improved economy. We found adequate fruit and vegetable intake in increasing trend for both sexes in both urban and rural areas. Improvement of educational status may have a role in the case of these increasing consumption patterns. Many adults consume inadequate FAVs; education and behavior change programs are needed

to promote their consumption. Innumerable awareness campaigns are very much required to popularize local and seasonal fruits.

Bhutan and Timor-Leste are comparatively in a good position of vegetables and fruit consumption among South East Asia countries

### *Physical activity level*

A low level of PA is highly prevalent among the Bangladeshi adult population. One in three adults is insufficiently physically active (9). Women are less active than men. This gender difference in physical activity may reflect the social norms and gender roles typical in Bangladeshi culture. In Bangladesh, women tend to have restricted outdoor engagement in recreational and social activities that often starts from puberty. Also, women are engaged more in household work and child rearing, so get less leisure time to be spent in physical activity. As two different calculations were being used at two different surveys, this comparison was not appropriate. However, a vigorous activity level is gradually decreasing all around the world. High-income countries are more inactive (37%) compared with middle income (26%) and low-income countries (16%) (10). Inadequate physical activity among children and youth is a

global public health challenge. This is of particular concern because of the health implications of insufficient physical activity. Promoting overall PA level at leisure time and commuting considering country context can be feasible options with particular attention to women.

### ***Overweight and obesity***

The recent trend of obesity among Bangladeshi (both adult and young generation) is exceptionally high. Due to the influence of the western lifestyle and the internet, children are more likely to consume fast food and other junk foods rather than home-made foods. Both central and generalized obesity is increasing day by day, and it is more in women than men.

The impression of obesity is the fearsome prior onset of NCDs, and in some cases, crippling circumstances are occurring. With collaboration with different countries worldwide, WHO is trying to calculate the worldwide economic impact of overweight and obesity to analyze the impact of globalization and the rapid socioeconomic transition on nutrition and identify the main political, socioeconomic, cultural, and physical factors that promote obesogenic environments.

Globally, there are more people who are overweight. Only Timor-Leste is in a better position than the other SEAR nations (obesity is 0.9% and overweight is 11.5%), but things become worse overall. The perception of obesity is the dreadful early onset of NCDs, and in some cases, life-threatening events are happening. The World Health Organization (WHO) is working with various nations around the world to estimate the economic costs of overweight and obesity globally, analyze the effects of globalization and the quick socioeconomic transition on nutrition, and pinpoint the primary political, socioeconomic, cultural, and physical elements that contribute to obesogenic environments.

### ***Hypertension***

In Bangladesh, approximately 20% of adults and 40–65% of older people suffer from hypertension (11). According to a Noncommunicable Disease risk factors survey, one-third of the Bangladeshi population never measured their BP (12). Numerous risk factors underlying hypertension have been distinguished, including non-modifiable factors such as age, gender, genetic factors, race, and modifiable

factors, including overweight, high sodium intake, and reduced physical activity. All the SEAR countries have an increasing trend of hypertension, which is a silent killer. Recent studies have proved that high salt and sugar-sweetened beverage consumption are associated with an increased risk of obesity (13,14). Through education and behavior change communication concerning salt reduction, community mobilization is the main strategy for reducing salt intake across the region. Countries should build capacity (i.e., engage the health workers and volunteer in counseling) regarding lowering salt intake, which will also help hypertension reduction.

### ***Diabetes mellitus***

An almost two-fold rise in prevalence from 2010 to 2018 through the 2010 survey was self-reported. In 2018 STEPS, there was an attempt to measure the prediabetic state (IFG), which is alarmingly high. A recent study reported that most adults with type 2 diabetes (T2D) in Bangladesh have a high prevalence of other risk factors accrediting to advanced blooming complications along with uncontrolled blood glucose. Moreover, diabetes and its complications also develop at a relatively younger age in South Asians than the Western population. Due to a long latent period, most people with T2D are diagnosed only after overt symptoms and complications. This late presentation and diagnosis contribute to excessive health care costs (15). Risk prediction and screening can make a way out to combat this epidemic.

### **Strength and limitations**

**Strength:** These two studies used demographic data and were both nationally representative. In order to determine the trend, we may now compare the baseline data from the 2010 poll with those from 2018. Adults 25 years of age or older were included in STEPS 2010; there was no age restriction. However, the age range for STEPS 2018 was 18–69. We found that the 2018 STEPS survey gave us some insight into the degree of salt consumption, oral health, cervical cancer risk, and cholesterol levels of the adult Bangladeshi population. All of these novel conjunctions will also be useful for influencing policy in relation to risk factor reduction tactics.

**Limitations:** We could not wholly compare both the surveys as all three steps were not followed in 2010, but



the 2018 STEPS followed all the steps and showed some new variables with their prevalence like cervical cancer, oral health, cardiovascular disease (CVD) risk prediction, etc. Again, trend analysis is not possible with such conditions. Moreover, few methods of ascertainment were totally differed in both the survey, so we will not be able to give any clear conclusion regarding the ultimate risk factors changes.

## Conclusions

Except for a few, all of Bangladesh's NCD risk variables are rising, which is quite concerning. The STEPS survey should be carried out over a defined period of time to enable easy comprehension of the shifting distribution of risk factors and prompt application of intervention. If the survey can be carried out among the ethnic or subgroups of people, the risk factors in that group will be clearly visible, and the focal area may be quickly determined. A more robust technology-based tool (on resource availability) should be used for data collection to make the survey more realistic. Extensive training for technical and technology-based data collection procedure is time worthy. The pattern of a few risk factors is changing dramatically. Positive changes should carry on, but for negative changes, effective planning and preventive strategies should patronize.

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## Footnote

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*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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