Original Article

Ten-year risk of cardiovascular events among the adult population of West Tripura District of India by the Framingham risk score: A cross-sectional study

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Abstract

Background: Cardiovascular diseases (CVDs) are the leading causes of mortality worldwide. Predicting the 10-year risk of cardiovascular events (CVEs) may save lives through timely intervention. Framingham risk scoring (FRS) can effectively predict this risk. **Objectives:** This study aimed to estimate the 10-year risk of CVE using FRS and to estimate the prevalence of CVD risk factors and their associations with FRS among adults in the West Tripura District of India. **Methodology:** This community-based cross-sectional study was conducted from 1 November 2019 to 30 November 2021 in the West Tripura District of India, using FRS 2008 and a pretested interview schedule among 290 individuals aged ≥ 30 years chosen by multistage sampling. **Result:** The majority, that is 61.7%, of the study subjects had low risk, 18.6% had intermediate risk and 19.7% had high risk of CVE within 10 years. The prevalence of hypertension was 55.6%; diabetes mellitus, 55.9%; smoking, 96.2%; dyslipidaemia, 34.3%; alcohol consumption, 96.2%; physical inactivity, 54%; and obesity, 64.6%. The bivariate analysis detected a significant association of FRS with age, sex, residence, literacy, marital status, obesity, smoking, alcoholism, blood pressure (BP), high-density lipoprotein cholesterol (HDL-C) and glycaemic status of the study subjects. The logistic regression analysis has identified age >50 years, male sex, hypertension, smoking and diabetes mellitus as significant determinants of high FRS. **Conclusion:** Adults living in the West Tripura District of India have a high prevalence of CVD risk factors. About one-fifth of this population has a high risk of CVE in 10 years. Controlling hypertension, smoking and diabetes mellitus may help reduce this risk.

Keywords: Cardiovascular disease, Framingham risk score

Introduction

Cardiovascular diseases (CVDs) are the leading causes of mortality worldwide, including in low- and middle-income countries.[1] The burden of CVD is large and is growing also in South Asia.[2] In India, CVDs are also the leading cause of morbidity and mortality. The Global Burden of Disease project has estimated that India contributed almost one-fifth (18.6%) of the global burden of CVD as measured by disability-adjusted life years (DALYs) in 2016.[3] India is in the middle of an epidemiological transition with the burden of disease shifting towards chronic conditions, of which CVDs form a major part. Recent trends indicate that these diseases have escalated to

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younger age groups also with a significant presence among males and females in both urban and rural areas.[4] The INTERHEART study has revealed that nine modifiable risk factors accounted for over 90% of the population-attributable risk of the first myocardial infarction, which is an important CVD.[5] These risk factors included smoking, dyslipidaemia, diabetes mellitus, hypertension, abdominal obesity, inadequate fruit and green leafy vegetable consumption, physical inactivity, alcohol consumption and psychosocial factors, namely depression, perceived stress and life events. This finding suggests that a large proportion of CVDs can be prevented if interventions are taken up for controlling the modifiable risk factors in time.[6] Thus, if it becomes possible to identify the subjects at risk of having cardiovascular events (CVEs) in advance, timely preventive measures can be initiated to save their lives. Clinicians have tried various methods to identify such high-risk subjects, but these turned out to be neither cost-effective nor reliable.

Later on, a screening tool called the 'Framingham risk score' (FRS), a sex-specific algorithm, was developed by epidemiologists to estimate the 10-year cardiovascular risk of an individual.[7] This algorithm was constructed using data from the Framingham heart study. It included age, sex, smoking, blood pressure and cholesterol concentrations as risk factors and estimated the 10-year risk of coronary events by stratifying individuals into three risk categories, namely low (<10%), intermediate (10–20%) and high (>20%).[8] It is an extensively studied index to predict the risk of CVE in the general population and is widely used across the globe. Being simple to apply, primary care physicians may easily practice it for screening subjects at risk of having CVEs and initiating appropriate preventive measures.

Tripura is a small hilly state in the north-eastern region of India. It differs from the mainland in various factors such as geographical and climatic conditions, ethnicity, composition of population, food habit, lifestyle, livelihood, socio-economic condition, literacy and genetic factors. As per the India State-Level Disease Burden Initiative report, prepared by the Indian Council of Medical Research, CVD (ischaemic heart disease (IHD) and stroke) remains in top among the top ten contributors of DALY loss in Tripura.[9]

Limited knowledge is available regarding the distribution of CVD risk factors in the different districts of Tripura. Moreover, no study has been conducted at the district level in Tripura State to identify the population at risk of having CVEs in future. Hence, this study was designed with the objective to estimate the 10-year risk of CVEs using FRS and to estimate the prevalence of CVD risk factors and their associations with FRS among the adult population living in the West Tripura District of India.

Methodology

This community-based cross-sectional study was conducted from 1 November 2019 to 30 November 2021 among 290 individuals aged ≥30 years, living in the West Tripura District of India. This district had 54% urban and 46% rural population,[10] so to ensure proportionate representation in the study sample 156 urban and 134 rural subjects were included. This district had four urban municipal areas, namely Agartala Municipal Corporation (AMC), Mohanpur Municipal Council (MMC), Ranirbazar Municipal Council (RMC) and Jirania Nagar Panchayat (JNP), and nine rural development blocks (RD blocks). There were 49 wards located in four zones of AMC (the largest population), 11 wards in JNP, 13 wards each in MMC and RMC and 172 gram panchayats (GP) in nine RD blocks.[11] The minimum sample size requirement for this study was determined using the formula for calculating sample size in prevalence studies using proportion, that is $n = [Z^2_{(1-\alpha/2)} \times P \times q] \div d^2$.[12] Here, n is the sample size; $Z^2_{(1-\alpha/2)}$ is the standard normal deviate and its two-tail value is 1.96 at 5% level of significance; P was the prevalence of hypertension in India, which was considered to be 21.1%[13]; d is the absolute error and 5% error was tolerated in this study; and q = (1 – P). Among multiple risk factors, the prevalence of hypertension was used to determine the sample size in this study as hypertension was considered to be the most useful indicator for identifying an individual's risk of developing CVE.[14] Considering 10% extra for the incomplete and non-responders, the sample size was determined to be 286 ~ 290 (rounded). A multistage random sampling technique was followed to select the study subjects.

In the first stage, separate sampling frames were constructed for each municipal and RD block using the names of wards and GPs present there, respectively. One municipal ward from each of the four zones of AMC, one each from MMC, RMC and JNP and one GP from each of the nine RD blocks were chosen by a simple random sampling technique using the lottery method. Thus, a total of seven urban wards and nine rural GPs were selected. About 91% of the urban population of West Tripura District lived in AMC, 4% in MMC and 2.5% each in RMC and JNP.[10] Hence, 140 households from AMC (35 from each zone), eight from MMC and four households each from RMC and JNP were selected. For selecting 134 rural households, each GP was considered similar in size and 15 households were chosen from each of the nine GPs.

In the second stage, a total of 290 households were chosen from the selected urban wards and rural GPs by a simple random sampling without replacement. For this purpose, separate sampling frames were constructed by incorporating the list of households collected from the family registers maintained in the respective municipal ward or GP offices. These 290 households were paid home visits being accompanied by medical social workers of the Department of Community Medicine, local Accredited Social Health Activist (ASHA) and Anganwadi Workers (AWWs). From one household, only one eligible study subject was included in the study sample by lottery. Pregnancy, history of CVE in the past, staying for <1 year in the study area, lack of physical or mental fitness to give a valid statement and denial for participation in this study were set as the exclusion criteria.

For data collection, a pretested interview schedule, a non-stretchable measuring tape, model: IND/09/98/219, manufactured by Crown Ltd., India, having a precision of 1 m; a digital bathroom weighing scale, model: GBS710, manufactured by Microgene Diagnostic Systems Pvt. Ltd., Ghaziabad, India, having a precision of 100 gm; a mercury sphygmomanometer, brand name 'Ashoka', IS: 3390, manufactured by Meditech Industries, Delhi, India; and an Auto Blood Analyzer, XL-640, manufactured by Trans Asia, were used. The interview schedule contained socio-demographic information about the study subjects along with components of FRS 2008.[7] FRS considered sex-specific age, smoking habit, systolic blood pressure (BP), serum level of high-density lipoprotein (HDL), and total cholesterol of a subject for determining his or her FRS in percentage. Each variable subgroup had a fixed assigned value. The obtained scores of a subject were added together, and the FRS percentage for that subject was determined by comparing this figure against a given set of values. This version of FRS was published in 2008 by the Adult Treatment Panel III (ATP III), an expert panel of the National Heart Lung and Blood Institute, which is a part of the National Institute of Health (NIH), USA. This data collection tool was pilot tested on 20 adults residing in the urban and rural field practice areas of a government medical college to verify its applicability in the local context.

Eligible study subjects were interviewed at their homes maintaining confidentiality in the presence of local ASHA after obtaining informed written consent for participation in this study. A physical examination was also performed, and data were recorded in the schedule. Subsequent dates were fixed, when the subjects were asked to remain on empty stomach till the collection of blood samples for testing of serum lipid profile and blood glucose. FRS was derived from the collected data to determine the 10-year risk of having CVEs for the study subjects.

Subjects with systolic BP ≥140 mm Hg and/or diastolic BP ≥ 90 mm Hg or on anti-hypertensive treatment were considered hypertensive. Subjects having a body mass index of ≥25 were labelled as obese. Serum cholesterol level <200 mg/dl was considered normal. Men with waist-hip ratio >0.9 and women with >0.85 were considered centrally obese. Taking two cups of green leafy vegetables daily was considered adequate. Subjects doing moderate work for at least 150 minutes per week were considered physically active. Subjects who reported the current habit of smoking any tobacco product either daily or occasionally were considered smokers. Subjects reporting consumption of liquor either occasionally or regularly were considered alcohol consumers. Subjects with fasting blood glucose level ≥126 mg% or on anti-diabetic medication were considered diabetic. BG Prasad's socio-economic status classification[15] was used for classifying the socio-economic status of the study subjects. Data entry and analysis were performed on a computer using Statistical Package for the Social Sciences (SPSS) version 26 (IBM Corp. Released 2019. IBM SPSS Statistics for Windows, Version 26.0. Armonk, NY: IBM Corp.) maintaining confidentiality. Continuous data were summarised as mean and standard deviation (SD). Discrete data were summarised as proportions. The significance of differences between two or more proportions was tested using the Chi-square test. A *P*-value less than 0.05 was considered statistically significant. The Institutional Ethics Committee of the parent institute has approved this study.

Result

In this study, initially 310 subjects were identified by the sampling procedure. Of them, seven subjects refused to give blood samples on an empty stomach for the estimation of fasting sugar and serum cholesterol level (total cholesterol (TC) and HDL cholesterol (HDL-C)), two women were pregnant, eight subjects produced documents of having some CVEs in the past and three subjects were staying in that area for less than 1 year. Thus, 20 subjects met the exclusion criteria. Finally, 290 subjects were included in this study, and among them, 156 were from urban areas and 134 were from rural areas.

The mean (SD) age of the study subjects was 51 (±5) yr ranging from 31 to 82 years. The majority, that is 61.7%, of the study subjects were found to have low risk, 18.6% were found to have intermediate risk and 19.7% were found to have high risk of CVE within 10 years. Hypertension, diabetes mellitus, smoking, alcohol consumption, physical inactivity and hypercholesterolaemia were more prevalent among males and urban population, whereas low serum HDL levels and central obesity were found to be more prevalent among females and subjects from rural areas.

The majority, that is 56.90% (165), of the study subjects were aged between 30 and less than 50 years, 53.45% (155) were female, 81.72% (237) were Hindu by religion, 44.14% (128) belonged to general caste, 82.41% (239) were married, 60.34% (175) studied up to either secondary or above, 63.45% (184) belonged to nuclear family and 36.55% (106) belonged to the upper middle class of socio-economic status as per BG Prasad's socio-economic status classification.[15] 29.31% (85) were homemakers [Table 1].

The prevalence of hypertension was 37.24%, smoking was 36.2%, hypercholesterolaemia was 39.31%, low serum HDL level was 46.9%, alcohol consumption was 18.3%, overweight and obesity were 62.41%, central obesity was 56.6%, physical inactivity was 34.50% and inadequate consumption of green leafy vegetables was found to be 32.4% in the study population [Table 2].

A significantly higher proportion of the subjects aged ≥50 years (72.00%) and male subjects (59.26%) had either moderate or high 10-year risk of CVE. Similarly, a significantly higher proportion of unmarried, widow, or separated subjects (76.47%) and subjects residing in rural areas (69.40%) had a low 10-year risk of CVE ($P < 0.05$). Higher educated subjects, subjects belonging to nuclear families, those who were Christian by religion and subjects belonging to the lower middle socio-economic class had low 10-year risk of CVE, but these were not significant ($P > 0.05$) [Table 3].

Table 1: Socio-demographic profile of the study population

Variables	Subgroups	Number	Percentage
Age	30 to <50 yr	165	56.90
	50 yr and above	125	43.10
Sex	Male	135	46.55
	Female	155	53.45
Residence	Urban	156	53.79
	Rural	134	46.21
Religion	Hindu	237	81.72
	Muslim	34	11.72
	Christian	19	6.56
Caste	General	128	44.14
	Scheduled caste	78	26.90
	Scheduled tribe	26	8.96
	Other backward community	58	20.00
Marital status	Married	239	82.41
	Unmarried	29	10.00
	Widowed/separated	22	7.59
Literacy	Illiterate	26	8.97
	Primary educated	89	30.69
	Secondary and above	175	60.34
Type of family	Nuclear	184	63.45
	Joint	106	36.55
Socio-economic status	Upper class	60	20.69
	Upper middle class	106	36.55
	Middle class	91	31.38
	Lower middle class	33	11.38
Occupations	Homemaker	85	29.31
	Unemployed	58	20.00
	Daily wage earner	58	20.00
	Business	41	14.14
	Service	48	16.55

Table 2: Prevalence of cardiovascular risk factors in the study population

Risk factors	Subgroups	Number	Percentage
Blood pressure	Normotensive	182	62.76
	Hypertensive	108	37.24
Smoking habit	Smoker	105	36.20
	Non-smoker	185	63.80
Total blood cholesterol	Normal	176	60.69
	Higher	114	39.31
Serum high-density lipoprotein	Normal and high	154	53.10
	Lower	136	46.90
Alcohol consumption	Consumed alcohol	53	18.30
	Not consumed	237	81.70
Body mass index	Low and normal	109	37.59
	High	181	62.41
Glycaemic status	Euglycaemic	222	76.60
	Hyperglycaemic	68	23.40
Central obesity	Present	164	56.60
	Absent	126	43.40
Physical activity level	Physically active	190	65.50
	Inactive	100	34.50
Intake of green leafy vegetable (GLV)	Adequate	196	67.60
	Inadequate	94	32.40

Ten-year risk of CVE was significantly higher among the hypertensive (67.60%), smoker (64.40%), alcoholic (62.26%), hyperglycaemic (79.41%), overweight and obese subjects (82.87%) and those who had central obesity (67.07%) ($P < 0.05$) [Table 4].

The logistic regression model showed that subjects aged ≥50 years had 88.38-fold higher chance of having CVE in 10 years as compared to those aged <50 years; similarly, males had 13.49 times higher chance than females, smokers had 4.37 times higher chance than the non-smokers, hypertensive subjects had 8.57 times higher chance than the normotensive subjects, subjects with low serum HDL level had 3.64 times higher chance and diabetic subjects had 37.17 times higher chance than the non-diabetic subjects for having CVE in 10 years and all these were found to be statistically significant ($P < 0.05$), whereas the rest did not attain the level of statistical significance [Table 5].

Discussion

The present study has found 10-year risk of CVE to be low in 62%, intermediate in 18.6% and high in 20% of the adult population living in the West Tripura District of India. Parikh S. *et al.*[16] have found it to be 77.7%, 11.7% and 10.6%, respectively, among the residents of Ahmedabad City of India, and Patil CR. *et al.*[17] have found it to be 72%, 17% and 11%, respectively, among the central Indian population, but Shrivastava SR. *et al.*[18] have found that 86% of the study population in Puducherry had low risk, 9.1% had moderate risk and 4.9% had high risk. Similarly, Nag T. *et al.*[19] have found low risk in 78% and intermediate or high risk in 22% of the adult population living in rural areas of West Bengal, India. Otgontuya D. *et al.*[20] estimated the 10-year risk of CVE to be high in 6%, 2.3% and 1.3% population of Cambodia, Malaysia and Mongolia, respectively. These were lower than the findings of the present study. It may be due to the difference in demography and settings. Ahmed MS. *et al.*[21] have found the 10-year risk of CVE to be more than 20% in 3.4% of the urban population of Bangladesh. This finding was similar to the finding of Otgontuya D. *et al.*[20] Dhungana RR. *et al.*[22] have estimated the risk of CVE to be >20% in 14.6% of the study population in Nepal, and it was similar to the present study. These differences may be due to the variations in lifestyle factors across the study settings.

In the present study, 8.97% of the study population was illiterate, 82.41% was married and no one belonged to lower socio-economic class, but in a study conducted in the urban slums of Cuttack City, Mishra DK. *et al.*[23] have found that 30% of the study subjects were literate, 66% were married and the majority were from lower socio-economic class. In the present study, only 11.38% of the study subjects belonged to the lower middle socio-economic class, whereas in the study conducted by Gupta R *et al.*[24] the majority of the study subjects belonged to the lower middle socio-economic class. These differences may be due to different study settings. In the present study, people belonging to the upper and upper middle socio-economic classes had a lower risk of CVE, whereas Gaziano TA *et al.*[2] have found

Table 3: Ten-year risk of CVE by socio-demographic profile of the study population

Socio-demographic parameters	Subgroup	Ten-year risk of CVE		Significance
		Low *n* (%)	Moderate and high *n* (%)	
Age group	<50 yr	134 (81.21)	31 (18.79)	χ^2=80.647
	≥50 yr	35 (28.00)	90 (72.00)	*p*=0.000
Sex	Male	55 (40.74)	80 (59.26)	χ^2=45.426
	Female	124 (80.00)	31 (20.00)	*p*=0.000
Marital status	Married	140 (58.58)	99 (41.42)	χ^2=4.964
	Unmarried/widow	39 (76.47)	12 (23.53)	*p*=0.0259
Residence	Urban	88 (56.41)	68 (43.59)	χ^2=4.648
	Rural	93 (69.40)	41 (30.60)	*p*=0.0311
Literacy	Illiterate	13 (50.00)	13 (50.00)	χ^2=2.788
	Primary	52 (58.43)	37 (41.57)	*p*=0.2481
	Secondary and above	114 (65.14)	61 (34.86)	
Type of family	Nuclear	120 (65.22)	64 (34.78)	χ^2=0.031
	Joint	71 (66.98)	35 (33.02)	*p*=0.8599
Religion	Hindu	140 (59.07)	97 (40.93)	χ^2=5.277
	Muslim	23 (67.65)	11 (32.35)	*p*=0.715
	Christian	16 (84.21)	03 (15.79)	
Socio-economic classes	Upper	39 (65.00)	21 (35.00)	
	Upper middle	58 (54.72)	48 (45.28)	χ^2=3.499
	Middle	60 (65.93)	31 (34.07)	*p*=0.3208
	Lower middle	22 (66.67)	11 (33.33)	

Table 4: Ten-year risk of CVE by cardiovascular risk factors in the study population

Cardiovascular risk factors	Subgroup	Ten-year risk of CVE		Significance
		Low *n* (%)	Moderate and high *n* (%)	
BP	Normotensive	144 (79.10)	38 (20.90)	χ^2=60.642
	Hypertensive	35 (32.40)	73 (67.60)	*p*=0.000
Smoking habit	Smoker	37 (35.60)	68 (64.40)	χ^2=47.132
	Non-smoker	142 (76.30)	43 (23.70)	*p*=0.000
Total cholesterol	Normal	109 (61.36)	67 (38.64)	χ^2=0.001
	Higher	70 (58.77)	44 (41.23)	*p*=0.9735
Serum HDL	Lower	76 (49.35)	78 (50.65)	χ^2=20.178
	Normal and high	103 (75.74)	33 (24.26)	*p*=0.000
Alcohol intake	Alcoholic	20 (37.74)	33 (62.26)	χ^2=14.578
	Non-alcoholic	159 (67.09)	78 (32.91)	*p*=0.0001
BMI	Low and normal	89 (81.65)	20 (18.35)	χ^2=114.122
	High	31 (17.13)	150 (82.87)	*p*=0.000
Glycaemic status	Euglycaemic	165 (74.32)	57 (25.68)	χ^2=61.369
	Hyperglycaemic	14 (20.59)	54 (79.41)	*p*=0.000
Central obesity	Present	54 (32.93)	110 (67.07)	χ^2=4.065
	Absent	69 (54.76)	57 (45.24)	*p*=0.0438
Physical activity	Physically active	113 (59.47)	77 (40.53)	χ^2=0.921
	Inactive	66 (66.00)	34 (34.00)	*p*=0.3372
GLV intake	Adequate	120 (61.22)	76 (38.78)	χ^2=0.015
	Inadequate	59 (62.77	35 (37.23)	*p*=0.9015

it to be the opposite. People with higher literacy had a lower risk of CVE in the present study, and it was on par with the findings of Indrayan A.[4]

In this study, urban people had a higher risk of CVE as compared to rural people (53.79% vs. 46.21%). Similarly, Geldsetzer P. *et al.*[25] have also found the urban population to be at higher risk of CVE than rural population. In the present study, subjects aged ≥50 years had a significantly higher risk of CVE within 10 years and it was on par with the findings of Valaulikar R. *et al.*[26] and Otgontuya D. *et al.*[20] This phenomenon may be due to age-related changes in the cardiovascular system, which are inevitable in every population. The present study has found the male subjects to be at higher risk of CVE, and it was similar to the finding of Parikh S. *et al.*[16] from an urban area of Northern India. On the contrary, Bansal P. *et al.*[27] have found females residing in rural area of central India had a higher risk of CVE.

Table 5: Result of logistic regression analysis

Variables	Subgroups	Adjusted OR (95% CI)	*P*
Age	<50 yr	1	0.000
	≥50 yr	88.38 (16.99–459.53)	
Sex	Female	1	0.001
	Male	13.49 (2.92–62.33)	
Smoking	Non-smoker	1	0.024
	Smoker	4.37 (1.22–15.68)	
Alcohol intake	Non-alcoholic	1	0.829
	Alcoholic	1.125 (0.38–3.29)	
BP	Normotensive	1	0.000
	Hypertensive	8.57 (3.63–20.23)	
Serum cholesterol	Normal	1	0.582
	High	0.77 (0.31–1.91)	
Serum HDL	Normal and high	1	0.006
	Low	3.64 (1.45–9.15)	
Diabetes mellitus	Non-diabetic	1	0.000
	Diabetic	37.17 (10.75–128.52)	
Central obesity	Absent	1	0.363
	Present	1.536 (0.61–3.86)	
BMI	Low and normal	1	0.413
	High	0.57 (0.32–1.89)	

The prevalence of hypertension was found to be 37.24% in this study, which was higher than the findings of Sengupta B. *et al.* (28.1%)[28] A significant association was also observed between hypertension and 10-year risk of CVE. It was similar to the findings of Singh G. *et al.*[29] The present study has detected the prevalence of diabetes to be 23.4%, which was higher than the National Family Health Survey (NFHS)-5 report for the West Tripura District. On the contrary, Patro S. *et al.*[30] have found it to be 38.8% in Eastern Orissa, which was higher than the present study.

A lower serum HDL-C level was found to be significantly associated with a higher risk of CVE, and it was on par with the findings of Borhanuddin B. *et al.*[31] Smokers had a significantly higher risk of CVE in the present study, and this finding was on par with the findings of Maharana L. *et al.*[32] from Telangana and Valaulikar R. *et al.*[26] from Karnataka. The present study has found the prevalence of overweight and obesity to be 62.41%, and higher body mass index (BMI) was significantly associated with a higher risk of CVE. This finding was on par with the finding of Sengupta B. *et al.*[28] The current study has found that a greater proportion of the study subjects was having central obesity, and it was significantly associated with a high risk of CVE in 10 years. This was similar to the findings of Maharana L. *et al.*[32] from Telangana. The present study has detected a significant association between alcohol consumption and high risk of CVE, which was on par with the reports of Bandela PV *et al.*[33] from Andhra Pradesh. This study has the strength that it included an adequate sample size including urban and rural areas. The shortcomings of this study are the lack of validation of the Framingham risk scoring in the Indian subcontinent. During data collection, some of the study subjects were on statin therapy, thereby showing lowered serum lipid levels. The use of smokeless tobacco is not counted in this scoring, and it may give a false lower score.

Conclusion

As per the Framingham risk score 61.7% of adults living in the West Tripura District of India have low risk, 18.6% have intermediate risk and 19.7% have high risk of CVE in 10 years. A primary care physician should screen and treat hypertension, diabetes mellitus and dyslipidaemia effectively and discourage smoking to reduce this risk.

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Conflicts of interest

There are no conflicts of interest.

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