

# The Heart of 25 by 25: Achieving the Goal of Reducing Global and Regional Premature Deaths From Cardiovascular Diseases and Stroke



## A Modeling Study From the American Heart Association and World Heart Federation

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### ABSTRACT

In 2011, the United Nations set key targets to reach by 2025 to reduce the risk of premature noncommunicable disease death by 25% by 2025. With cardiovascular disease being the largest contributor to global mortality, accounting for nearly half of the 36 million annual noncommunicable disease deaths, achieving the 2025 goal requires that cardiovascular disease and its risk factors be aggressively addressed. The Global Cardiovascular Disease Taskforce, comprising the World Heart Federation, American Heart Association, American College of Cardiology Foundation, European Heart Network, and European Society of Cardiology, with expanded representation from Asia, Africa, and Latin America, along with global cardiovascular disease experts, disseminates information and approaches to reach the United Nations 2025 targets. The writing committee, which reflects Global Cardiovascular Disease Taskforce membership, engaged the Institute for Health Metrics and Evaluation, University of Washington, to develop region-specific estimates of premature cardiovascular mortality in 2025 based on various scenarios. Results show that >5 million premature CVD deaths among men and 2.8 million among women are projected worldwide by 2025, which can be reduced to 3.5 million and 2.2 million, respectively, if risk factor targets for blood pressure, tobacco use, diabetes mellitus, and obesity are achieved. However, global risk factor targets have various effects, depending on region. For most regions, United Nations targets for reducing systolic blood pressure and tobacco use have more substantial effects on future scenarios compared with maintaining current levels of body mass index and fasting plasma glucose. However, preventing increases in body mass index has the largest effect in some high-income countries. An approach achieving reductions in multiple risk factors has the largest impact for almost all regions. Achieving these goals can be accomplished only if countries set priorities, implement cost-effective population wide strategies, and collaborate in public-private partnerships across multiple sectors.

**Key Words:** AHA Scientific Statements; cardiovascular diseases; forecasting; global health; premature mortality; prevention and control<sup>15</sup>

The World Health Organization (WHO), empowered by unanimous proclamation at the United Nations high-level meeting on noncommunicable diseases (NCDs) in September 2011, set a number of key targets for all nations to reach by 2025 [1]. The overarching goal is to reduce the risk of premature deaths (defined as the probability of dying

between the ages of 30 and 70 years) from NCDs (cardiovascular disease [CVD], including stroke, diabetes mellitus [DM], cancer, and chronic respiratory disease) by 25% by the year 2025 (referred to as 25 by 25). The Global Cardiovascular Disease Taskforce, comprising the World Heart Federation, American Heart Association, American College

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of Cardiology Foundation, European Heart Network, and European Society of Cardiology, with expanded representation from Asia, Africa, and Latin America, along with global CVD experts, disseminates information and approaches to reach the WHO 2025 targets [2–4].

To achieve the overarching 25 by 25 target, the WHO identified 8 targets in the prevention, control, and treatment of 6 key risk factors, as well as 2 health systems targets related to the use of essential medicines, technologies, and drug therapies, to prevent NCDs, particularly CVDs [5]. Of the 8 targets, 6 directly align with traditional CVD and stroke risk factors: 3 risk factors (tobacco use, sodium intake, physical inactivity), 2 biological risk factors (raised blood pressure [BP], DM/obesity), and 1 management target directed at the treatment of individuals at high risk of CVD. With CVD as the largest single contributor to global mortality, accounting for nearly half of the 36 million annual NCD deaths, and with a global cost of nearly US \$863 billion, achieving the global target to reduce premature NCD deaths by 25% requires that CVD and its risk factors be aggressively addressed by WHO member states, policy makers, professional organizations, public health experts, healthcare providers, and key stakeholders [4].

Although the prevalence of many of these risk factors has improved globally over the past 30 years, with the exception of DM and obesity, trends are not homogeneous (Table 1) [11]. Between 1990 and 2013, the age-standardized CVD death rate decreased by >22% for both ischemic heart disease and stroke [12]. With these trends taken into account, continued progress toward improving cardiovascular health and reducing CVD and stroke deaths is vital to reaching the overall premature NCD mortality goal by 2025, just 1 decade away. The aims of this document are to investigate the potential impact of reaching selected targets in the WHO Global Monitoring Framework on the reduction of premature CVD mortality by 2025 and to examine the policy implications of these predictions.

## DATA AND METHODS

The writing committee reflects the members of the Global Cardiovascular Disease Taskforce. The committee engaged researchers at the Institute for Health Metrics and Evaluation, University of Washington, Seattle, to develop region-specific estimates of premature cardiovascular mortality in 2025 based on various scenarios. The Institute for Health Metrics and Evaluation is the coordinating center for the Global Burden of Disease (GBD) Study, a multinational effort to produce consistent estimates of death and disability by age, sex, and over time for all countries [12].

The methods and results of this exercise have been reported in detail [13]. Data were drawn from the GBD 2013 study [12]. All estimates were produced separately for each age/sex/country/disease-specific strata and then collapsed to create regional estimates. A list of GBD 2015 geographies detailing the countries that make up regions and superregions is available elsewhere [14].

To create a scenario in which risk factors continue the trend observed since 1990 ("business as usual"), the analysis first estimated the proportion of CVD and stroke deaths in 1990 and 2013 resulting from raised systolic BP, tobacco smoking, high body mass index (BMI), and high fasting plasma glucose using a population-attributable fraction. The effect of serum cholesterol was not included because it was not listed among the 8 primary WHO 25 by 25 targets.

The theoretical minimum risk exposure distribution used for the GDB 2010 study was applied except for systolic BP, for which a theoretical minimum limit of 115 mm Hg was adopted [15]. With the use of the annualized rate of change between 1990 and 2013, it was assumed that the remaining deaths unattributed to these risk factors would continue their observed trend. Beginning in 2014, deaths attributable to the selected risk factors were estimated from the same population-attributable fraction and risk factor exposures estimated for GBD 2013 for each age/sex/country/year projected to 2025 and the annualized rate of change between 1990 and 2013. Future scenarios were developed to match 4 key risk factor targets for 2025: no

TABLE 1. Trends in global cardiovascular health

Metric	Global Prevalence			
	1980		2008–2012	
	Men	Women	Men	Women
Tobacco use, % [6]	41.2 (40.0–42.6)	10.6 (10.2–11.1)	31.1 (30.2–32.0)	6.2 (6.0–6.4)
Mean systolic BP, mm Hg [7]	130.5 (127.3–134.0)	127.2 (124.1–130.6)	128.1 (126.7–129.4)	124.4 (123.0–125.9)
Raised BP, % [7]	33 (28–39)	29 (25–34)	29 (27–31)	25 (23–27)
Physical inactivity, % [8]	N/A	N/A	19.8 (13.4–32.1)	26.8 (18.5–38.9)
Obesity, % [9]	4.8 (4.0–5.7)	7.9 (6.8–9.3)	9.8 (9.2–10.4)	13.8 (13.1–14.7)
DM, % [10]	8.3 (6.5–10.4)	7.5 (5.8–9.6)	9.8 (8.6–11.2)	9.2 (8.0–10.5)

Values in parentheses are 95% uncertainty intervals.

BP, blood pressure; DM, diabetes mellitus; and N/A, not applicable.

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