

New Global CVD Atlas shows wealthy countries gradually reducing their burden of heart disease and stroke

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A new Global Cardiovascular Disease (CVD) Atlas, launched by the World Heart Federation in its journal *Global Heart*, shows that in wealthy countries, the burden of cardiovascular disease is falling both in crude and age-standardised terms, while clusters of low-income and middle-income countries (LMIC) are seeing rises in their CVD burden as their populations continue adapt to demographic and behavioural changes including increased life expectancy, poor diet, continued and in some cases increased tobacco smoking, and a more sedentary lifestyle. The Atlas was prepared by a team including Assistant Professor Andrew Moran, Columbia University, New York, NY, USA; Assistant Professor Gregory Roth, Institute for Health Metrics and Evaluation and the University of Washington, Seattle, WA, USA; Professor Jagat Narula, Mount Sinai Medical Center, New York, NY, USA, and Dr George Mensah, National Heart, Lung, and Blood Institute, National Institutes of Health, Bethesda, MD, USA.

"The Atlas uses a measure called disability adjusted life years (DALYs) to measure the burden of CVD in each region and country in the world, and measure the differences between 1990 and 2010 based on the Global Burden of Diseases, Risk Factors, and Injuries 2010 Study. DALYs are a measure combining both premature deaths and years lived with disability", explains Dr. Narula, Editor-in-Chief of *Global Heart*. "While total CVD DALYs in any country or region show the absolute burden of CVD, the Atlas also includes DALYs per 100,000 people so that changes

over time and differences among countries and regions can be compared."

Worldwide, the CVDs contributing most to the total global burden of disease in 2010 were ischaemic heart disease (5.2% of all DALYs lost) and stroke (4.1% of all DALYs lost). The other major CVDs included in the atlas were hypertensive heart disease, cardiomyopathies, rheumatic heart disease, atrial fibrillation, aortic aneurysm, peripheral vascular disease, and endocarditis. "For both stroke and ischemic heart disease, global age-standardised mortality has decreased, but population growth and aging have increased both the absolute number of CVD deaths and survivors suffering with late effects of the two most important CVDs," say the authors. In 1990, there were 5 211 790 deaths caused by ischaemic heart disease, which increased 35% to 7,029,270 in 2010. Stroke deaths (all types combined) also increased by 26% from 4,660,450 in 1990 to 5,874,180 in 2010.

The authors say: "It comes as no surprise that classic risk factors responsible for global CVD burden—dietary risks, high blood pressure, and tobacco smoking—were leading risk factors around the world. Tobacco smoking was ranked comparatively lower as a CVD risk factor in Australasia, Western Europe, and North America, likely due to both aggressive tobacco control measures and shifts in societal attitudes toward tobacco use in recent decades. Elsewhere, in some of the world's most populous regions like East Asia and Southeast Asia, smoking prevalence remains high, and tobacco is the third leading risk factor behind dietary risks and high blood pressure."

Alcohol use ranked as the fifth leading cause of CVD burden in Eastern Europe, but was no higher than 10th in all other regions. Outdoor air pollution ranked particularly high (fourth) as a risk factor for CVD in East Asia. Household air pollution (usually from home cooking fires) ranked particularly high as a cause of CVD burden in South Asia and

Sub-Saharan Africa. High body mass index ranked third as a CVD risk factor not only in the Australasia, North America, European, and Central Asia regions, but also in Latin American/Caribbean and North Africa and the Middle East.

Among the wealthy countries, Norway, Ireland, the UK, and Israel showed the most % improvement between 1990 and 2010, with each almost halving its crude CVD DALY burden per 100,000 people. For example, the UK reduced its CVD DALY burden by 43% from 7777 per 100,000 (1990) to 4376 (2010). "The reductions in CVD burden per capita in high income regions are impressive, and have occurred despite aging populations," says Dr Moran. "Other studies of CVD trends suggest that CVD reductions in the high income world are due to a combination of reduced smoking, improved risk factor control, and improved treatments. Some changes in diet, lifestyle, and broader social and economic forces may play a role too, but are harder to measure."

Among the 33 CVD Atlas high income countries, the biggest climb up the ranks toward a lower per capita CVD burden between 1990 and 2010 were Ireland (23rd to 9th), the UK (31st to 18th) New Zealand , Norway (26th to 14th) , and New Zealand (18th to 8th). Going to a lower ranking were Malta (11th to 21st) and Andorra (17th to 31st), both countries with relatively more modest improvements in per capita DALYs, and Japan, which actually saw a small increase in total CVD DALYs most probably due to its more rapidly ageing population (Japan's ranking fell from 3rd to 15th). Brunei had the lowest burden of CVD DALYS per 100,000 of all high income countries, followed by Israel, South Korea, and Chile. Greece had the highest per capita burden, followed by Germany, Andorra, and Finland. The United States performed well in absolute terms, reducing per capita DALYs by 33% between 1990 and 2010, but its rank among 33 Atlas high income countries changed little (ranked 18 in 1990 and 19 in 2010).

Many countries of the former Soviet Union, including Russia itself, Belarus, Armenia, and Kazakhstan, along with Albania and Bangladesh, did not fare so well, with all seeing their CVD DALY burden increase by more than 30%. "The former Soviet countries have fared poorly and the big contributions of alcohol and tobacco points to underlying social and economic forces at work," says Dr Moran.

Elsewhere, in the North Africa and Middle East Region, obesity, poor diet and high blood pressure all caused sharp rises in the CVD DALY burden. In this region in 2010, almost a quarter of all DALYS in men and 11% of those in women were caused by CVD. Kuwait was the worst performing country in the region from 1990 to 2010, with an absolute increase in CVD DALYs of 28%. "In the large populations of the South Asia and North Africa and Middle East regions, the absolute burden of CVDs is high and more often affects young, working-age adults," says Dr Moran.

In sub-Saharan Africa, CVD attributed to all risk factors increased from 1990 to 2010. Because of a high prevalence of communicable, maternal, neonatal and nutritional disorders, less than half of the burden of disease in sub-Saharan Africa in 2010 was due to non-communicable diseases, overall, and only around 7% was due to CVDs.

Across all world regions, ischaemic heart disease and stroke were the leading cause of CVD DALYS. The burden of rheumatic heart disease fell in all regions apart from sub-Saharan Africa, and the burden due to peripheral artery disease increased in all regions and by a staggering 24 times in Latin America and the Caribbean. This may be related to increased prevalence of overweight, obesity, and diabetes in many countries of the Latin America and Caribbean region and almost all other world regions. For example, in Western Europe, the burden of peripheral vascular disease DALYS doubled from around 100,000 to around 200,000. Atrial fibrillation mortality globally doubled between

1990 and 2010, suggesting that the atrial fibrillation burden will continue to grow as the global population ages.

"The only way to achieve this goal will be to extend the CVD control successes of the high income world to low and middle income countries. In some cases this may mean adapting past successful programs; in other cases locally tailored and innovative approaches will be needed," concludes Dr Moran.

As World Heart Federation President Professor K. Srinath Reddy emphasises in his introduction to the Global Atlas of CVDs, about 80% of non-communicable disease deaths, which include CVD deaths, occur in low and middle income countries. The World Heart Federation has adopted an overarching goal of a 25% reduction in pre-mature mortality from CVD by the year 2025. This is consistent with the World Health Organization (WHO) goal, adopted after the 2011 United Nations High Level Summit on Noncommunicable Diseases (NCDs), of a 25% reduction in premature mortality from NCDs by 2025.

The major focus of the World Heart Federation under Professor Reddy's presidency will be: 1) prevention, detection and control of high blood pressure; 2) reduction of tobacco consumption (active and passive); and 3) secondary prevention of CVD through strengthening of delivery and adherence at various levels of healthcare.

Provided by World Heart Federation

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