



# Keeping a finger on the pulse: Cardiovascular disease rate as a measure of sustainable development

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## DECLARATIONS

### Competing interests

None

### Funding

Nazeeha Hasan is funded by the Medical Research Council.

### Ethical approval

None

### Guarantor

None

### Contributorship

None.

### Acknowledgements

None

## Abstract

Non-communicable diseases have been somewhat neglected as a public health issue in the past, but there is now growing international consensus that they present a significant obstacle to economic development for both high- and low-income countries. Cardiovascular disease accounts for more than half of all non-communicable disease deaths, and presents a promising target for curbing the non-communicable disease epidemic. This article explains the pressing need for non-communicable disease prevention, focusing on strategies that can be employed to decrease cardiovascular disease risk at an individual and population level, and outlines the UK's approaches to cardiovascular disease prevention in particular. Given the mounting burden of non-communicable diseases, responsible health governance and a balanced economic policy could consider the use of low cardiovascular disease rates as a measure of positive and sustainable economic development.

**Key words:** Ethics and policy, cardiology, treatment

'Non-communicable diseases deliver a two-punch blow to development. They cause billions of dollars in losses of national income, and push millions below the poverty line.'

*Margaret Chan, World Health Organisation (WHO) Director General*

In 2001, the Millennium Development Goals (MDGs) were established to tackle many of our greatest global development challenges. However, the world leaders drafting this road map made one serious wrong-turn: they failed to recognise the importance of non-communicable diseases (NCDs).

Four main NCDs – vascular disease, cancer, chronic respiratory diseases and diabetes – kill three in five people worldwide. Contrary to common belief, NCDs are not only 'diseases of affluence', with an overwhelming majority of NCD deaths occurring in low- and middle-income countries. However, it is estimated that compared to the \$23.90 per disability adjusted life year (DALY) dedicated to HIV, TB and malaria in developing countries in 2007, only \$0.78 was spent on NCDs.<sup>1</sup> As one diabetic patient in Cambodia put it, 'I wish I had AIDS'.

Ironically, failure to address the burden of NCDs will substantially impact the achievement of the MDGs. 'What gets measured gets done'

says Margaret Chan; at present NCDs are not being effectively measured, and hence are not 'getting done'. The 2011 UN High-Level Meeting finally delivered NCDs to international attention, and in June 2012 the Rio+20 conference concluded that the global burden of NCDs constituted a major challenge to sustainable development in the 21st century. With the MDGs set to expire in 2015, there is widespread acceptance that future sustainable development goals should include NCDs.

In light of this political awakening, how do we devise a battle plan to curb the NCD epidemic?

### Targeting cardiovascular diseases

Cardiovascular disease (CVD) is responsible for more than half of NCD deaths, and reports suggest that countries could spend more than 40% of their healthcare budgets on CVD complications.<sup>2</sup> With accelerating global trends in consumption, urbanisation and life expectancy, the burden of CVD is set to soar if left unchecked. The trend towards increasing CVD incidence at younger ages is of great public health significance as these patients carry the potential for a greater lifetime burden of disease and disability.<sup>3</sup>

There is a clear vision on how to tackle CVD burden, consisting of a three-pronged approach<sup>4</sup>: surveillance (mapping and monitoring the CVD epidemic), prevention (reducing exposure to risk factors) and management (equitable health care for people with CVD).

Improvements in post-event management, through faster emergency response times, more accurate diagnostics, and increased medical intervention, have improved the survival of people suffering from vascular events. In the future, effective implementation of innovations such as the polypill could substantially decrease mortality due to CVD. Nonetheless, up to 60% of the decrease in mortality rates can be attributed to lower disease occurrence.<sup>5</sup> The benefits of reducing key CVD risks are not only very large but can also occur relatively quickly, being realised within five years compared to around three decades for achieving the full benefit of smoking cessation on lung cancer, for example.<sup>6</sup> Importantly, this strategy will impact the prevention of multiple NCDs and contribute to reduced demand and cost of

specialist treatment, providing cost-effective, large-scale benefits for society.

### A recipe for prevention

The majority of premature deaths from CVD can be prevented by addressing just three factors: tobacco use, poor diet and lack of physical activity.<sup>6</sup> Diabetes, hypertension and hypercholesterolaemia account for an estimated half of global ischemic heart disease burden, high body mass index (BMI) for around 20% and smoking for 13%.<sup>7</sup>

It is estimated that a 1% reduction in the relative risk of CVD could result in NHS savings of 30 million per year in England and Wales.<sup>8</sup> While great improvements have been made in CVD management, a 2003 audit revealed that of 78,600 CHD (Coronary Heart Disease) patients in the UK, only 6% were achieving their target blood pressure, 48% had a valid cholesterol measurement and just 55% were taking statins.<sup>9</sup> A recent review of the Global Burden of Disease Study found that up until 2010, the UK still fell behind many European countries when comparing premature CVD mortality rates, and concluded that improvements in public health, prevention and treatment were required to address this.<sup>10</sup>

CVD prevention can be implemented on three levels. Primordial prevention (also known as cardiovascular health promotion) aims to prevent CVD risk factors from developing at all, and can be applied in situations where social and economic development has yet to progress to the point of cultivating a risk factor epidemic.<sup>11</sup> Thus, strong policies focussing on school-based education and child health programmes can have large latent effects upon future CVD prevalence rates.

Secondly, an individual risk-based approach to prevention can identify those at high risk of CVD who would benefit most from aggressive risk factor management. Primary prevention aims to prevent a first CVD event by detecting and managing people with risk factors but no recognised disease. For those with known CVD, secondary prevention aims to reduce the risk for subsequent vascular events by treating CVD and the associated risk factors. It is important to note that definitions of risk can vary; for example, the European guidelines categorise 'high risk' as a

10 year risk of > 5% for an asymptomatic individual to develop a fatal CVD event, while Joint British Societies' (JBS2) guidelines specify high risk as a 10 year risk of > 20% of developing a first CVD event.

In the UK, the high-risk screening policy for preventing CVD was typified by the NHS Health Check Putting Prevention First programme, introduced in 2009.<sup>12</sup> This specified that all adults ages 40–74 years old should be screened for CVD risk, and those individuals found to exceed a 20% risk of a vascular event within the next decade should be treated with education on lifestyle choices as well as medication to reduce blood cholesterol and blood pressure, as appropriate. This programme, which will be the responsibility of local authorities as of April 2013, has substantial potential to prevent premature CVD mortality through early detection and intervention. However, evidence suggests that these high-risk individual approaches can widen health inequalities.<sup>13</sup> Studies have reported that substantial socioeconomic gradients exist in statin use in the UK as well the Danish healthcare system which, like the NHS, aims to ensure equity in medical health.<sup>14,15</sup>

Targeting high-risk individuals may also represent a relatively ineffective approach to CVD prevention; an alternative is population-wide prevention. There is now growing support for the seminal work of Geoffrey Rose, who advocated a dual prevention strategy: teaming individual-level intervention with a whole-population approach, on the premise that a small reduction in risk in a large number of people can prevent more cases of disease than treating a small number at high risk.<sup>16</sup>

With mounting evidence that risk factors can be reduced in whole populations, there is an increasing requirement for the implementation of policies and programmes that do so. Professor Stephen Gielen, speaking at the EuroPREvent 2013 congress, stressed that the key message still lay in 'banning tobacco, promoting healthy diets, increasing exercise and moderating alcohol consumption'. The UK NICE Guidelines for Prevention of CVD at the Population Level recently established a national framework for action in 2010, consisting of legislative and regulatory changes within the food industry and European Union agricultural policy, as well as

detailing recommendations for running effective regional CVD prevention programmes.

While many industrialised countries aim to educate their population about disease risk and prevention, this may not always be effective. A substantial obstacle to effective CVD management is clinical uncertainty over recommendations for primary and secondary prevention. In a large survey across five European countries, 18% of primary care physicians reported that a major barrier to improved delivery of CVD prevention was confusion over clinical recommendations for risk factor management.<sup>17</sup> Nonetheless, there have been successes: Canada is the only country in the world to annually update its hypertension guidelines, ensuring continuous public awareness and education for health professionals, and it is likely that the greater-than-expected reduction in CVD mortality over the past decade can be explained in part by Canada having one of the lowest mean levels of population systolic blood pressure in the world.<sup>18</sup> The impressive CVD decline in Finland has been attributed to reductions in blood pressure, cholesterol and smoking, despite rising BMI levels.<sup>19</sup> Thus, timely implementation of risk prevention strategies, which have potential for change at the population level, will contribute to substantial reductions in the economic and social burden of CVD.

## Collaborate and innovate

The key to addressing the NCD epidemic also lies in the integration of complimentary disciplines. The 2006 Science Policy Conference, co-hosted by the Academy of Medical Sciences, the MRC, The Wellcome Trust and GlaxoSmithKline, concluded that greater interaction was required between public and private sectors to combine financial, human and scientific resources in order to achieve R&D advances that can be translated into tangible benefits for developing countries. This sentiment was echoed by the Grand Challenges in Chronic NCDs Global Partnership in 2007, and in April 2012 the Academy of Medical Sciences announced its five-year vision for NCDs, focussing upon strengthening international collaboration and relationships between academia, industry, healthcare workers and the government.

Successful intervention will require a combination of strategic frameworks and the tactical use

of complimentary frameworks needs to be integrated into the core process of health governance. It is also important to appreciate that health governance is often a complex political battle. The WHO's fight against the powerful vested interests of the tobacco industry in the late 1990s was only successful once evidence-based medicine could be restructured to demonstrate the effects of tobacco on education, economics, development and human rights.<sup>20</sup> Lessons from this should be taken by public health advocates currently facing a similar battle with the food industry, given the proven links between a high salt diet and CVD risk – while a 1 g reduction in salt consumption has been achieved in the UK, this is still a long way off the 6 g reduction achieved in Japan and Finland, despite strong resistance from the food industry.

Faced with the challenges of financial austerity, shrewd health policy decisions will be all the more critical, and there is growing acknowledgement that a balanced economic policy should consider low NCD rates as a measure of positive, sustainable development. In a new era of political engagement and interdisciplinary partnerships, it seems we have reached a turning point in our understanding of CVDs and the NCD epidemic. The future of successful global health governance now rests with our policymakers, who must act as the drivers for change.

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