

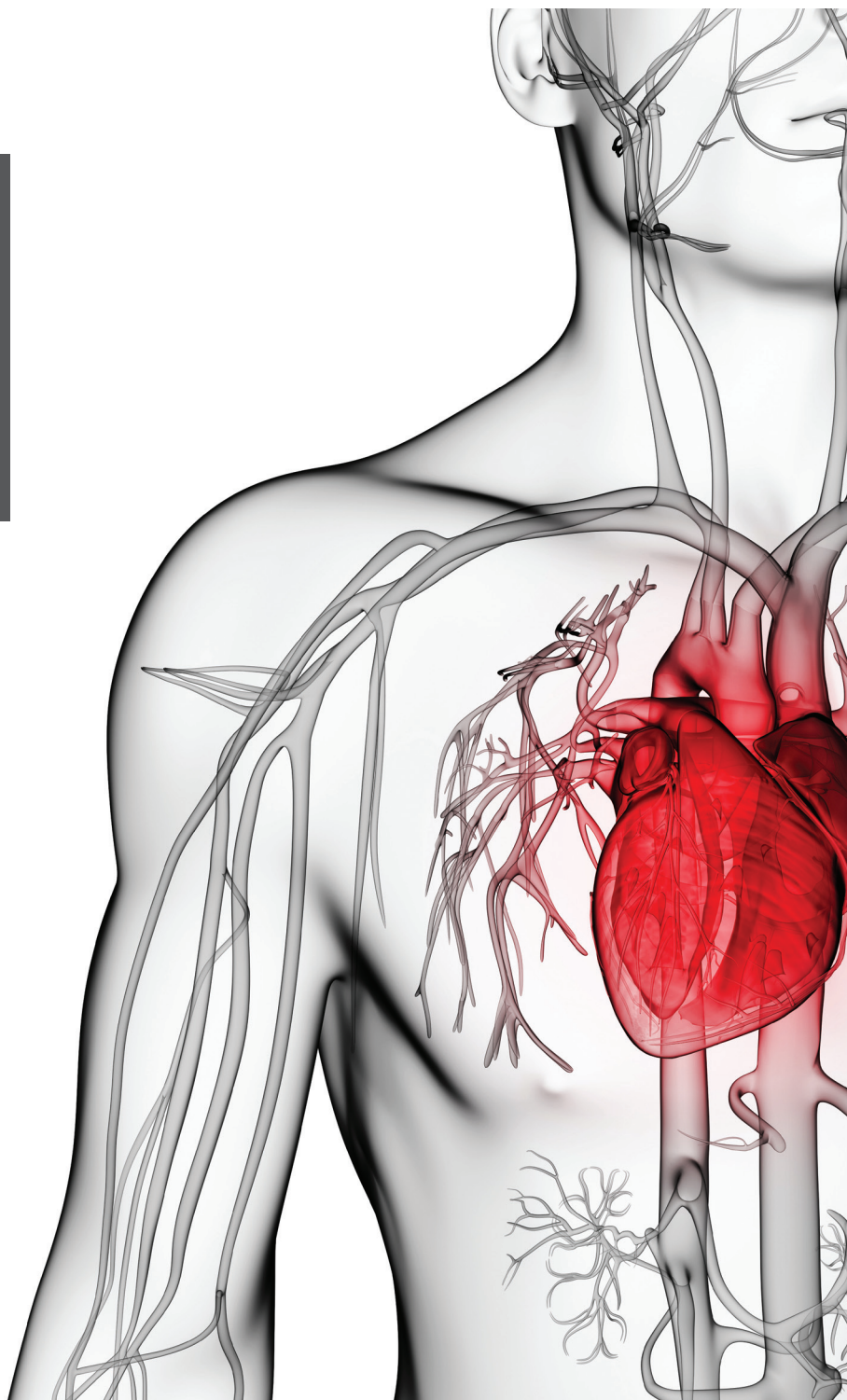
The
Economist

Intelligence
Unit

THE HEART OF THE MATTER

RETHINKING PREVENTION OF
CARDIOVASCULAR DISEASE

A report by The Economist Intelligence Unit



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About the report

The heart of the matter: Rethinking prevention of cardiovascular disease is an Economist Intelligence Unit report, sponsored by AstraZeneca. It investigates the health challenges posed by cardiovascular disease (CVD) in the developed and the developing world, and examines the need for a fresh look at prevention. The report focuses on several key discussion points, taking a broad look at matters of general application. Given the scope of the disease, together with a multitude of local issues across a range of regions and countries, it is not intended to be a conclusive or comprehensive study of the entire prevention landscape.

The findings of this white paper are based on desk research and interviews with a range of healthcare experts. Bazian, an Economist Intelligence Unit company specialising in evidence-based healthcare, contributed to the desk research through a range of focused, systematic searches of medical databases including Medline, Embase and DARE, and citation mapping using Google Scholar.

Our thanks are due to the following for their time and insight (listed alphabetically):

- Dr Kingsley Akinroye, former president, African Heart Network; incoming vice-president, World Heart Federation
- Ms Beatriz Champagne, executive director, InterAmerican Heart Foundation
- Dr Douglas B. Clement, chair, Heart and Stroke Foundation of Canada
- Dr Valentin Fuster, director of Mount Sinai Heart and physician-in-chief at The Mount Sinai Medical Center, New York

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- Dr Mike Rayner, director, British Heart Foundation Health Promotion Research Group
- Dr Srinath Reddy, president, World Heart Federation
- Professor Walter Ricciardi, president of the European Public Health Association (EUPHA)
- Dr Catherine Sykes, researcher, health psychology, City University, London
- Dr Janet Wright, executive director, Million Hearts
- Professor Salim Yusuf, director, Population Health Research Institute, McMaster University, Hamilton, Canada

The report was written by Paul Kielstra and edited by James Chambers.

Executive summary

Cardiovascular disease (CVD) is the world's leading killer. It accounted for 30% of deaths around the globe in 2010 at an estimated total economic cost of over US\$850bn. CVD is therefore attracting increased attention, along with other non-communicable diseases (NCDs). September 2011 saw a high-profile UN summit on these conditions and earlier this year the World Health Organization (WHO) released an action plan to help address them.

Despite greater recognition of the problem, every indication is that it will get worse before it gets better. One or more known lifestyle-driven risk factors are high, rising, or both in many parts of the world, including high blood pressure, obesity, tobacco consumption and excessive salt intake. Moreover, population ageing and the typical results of economic development, such as urbanisation, bring added risks.

All the same, a large majority of CVD cases are preventable, making the current underuse or insufficient effect of interventions difficult to fathom. This study therefore considers the scope of the global challenge of cardiovascular disease and how prevention is evolving to address it.

Key findings from the report include:

Cardiovascular disease is now a global epidemic, increasingly affecting the poor. CVD remains the leading killer in developed nations,

accounting for 43% of all deaths in 2010. This is down from 48% 20 years ago, although population ageing and obesity could hamper future progress. Meanwhile, in developing countries, the trend is definitely upwards. The overall burden remains lower than in the developed world, causing 25% of all deaths, but the indicators point to further growth of the disease burden, as smoking rates remain high and unhealthy Western eating habits are increasingly adopted. The common feature of the disease across the world is its disproportionate impact on individuals from lower socio-economic groups.

Prevention could greatly reduce the spread of CVD but it is widely underused. Reduced smoking rates, improved diets and other primary prevention efforts are responsible for at least half of the reduction in CVD in developed countries in recent decades. Adding the impact of secondary prevention means that a large majority of cardiovascular diseases are avoidable. But prevention is little used. Governments devote only a small proportion of health spending to prevention of diseases of any kind—typically 3% in developed countries; individuals are adopting lifestyles with negative health consequences; doctors are not prescribing risk-reducing medications to many individuals who would benefit; and even when these prescriptions exist a majority of patients with CVD do not follow them.

Population-wide measures yield significant results but require political adeptness to succeed. Using individual counselling to affect a healthier lifestyle offers a poor return on investment. Taking action to reduce CVD risks across an entire population, through mass education and regulation, can have widespread, immediate effects. Bans on smoking in public places, for example, typically cut heart attacks in the affected population by 13% within a year. Yet using government power to enforce even positive lifestyle changes is a highly political act, which can arouse strong opposition, such as that which led to the failure of Denmark's "fat tax" in 2011. These measures can be effective once the population has been won over, but there is no shortcut for the long, slow work of changing hearts and minds.

The role of health professionals and individuals needs to shift. The size of the CVD epidemic is such that a doctor-centred health system will not be able to cope. A greater emphasis on primary care and innovative ways for nurses and non-medical personnel to provide preventative services will be needed. Meanwhile, giving patients a greater role in their own care can help improve adherence to treatments and rates of lifestyle change in some cases. The spread of consumer technology—allowing individuals to monitor their own blood pressure or even take electrocardiograms—holds out the possibility of patients taking a larger role still, but medical professionals remain wary of giving too much say to individuals.

An expanding community of CVD stakeholders should seek greater collaboration. A growing number of stakeholders are involved in CVD prevention, sharing the burden with governments and transforming a medical view of the disease into a broader societal view. Co-ordination efforts between these groups are on the rise, from non-governmental organisations (NGOs) dedicated to fighting CVD, cancer, diabetes and tuberculosis, to each department in government being involved in population health, not just the ministry of health. This co-ordination will be boosted by the WHO's state-level international action plan for NCDs. Now greater collaboration across different sectors and interest groups should be encouraged, such as the US's Million Hearts initiative.

Collaboration works when incentives of stakeholders are aligned. Prevention frequently fails because it does not align with existing interests: politicians see greater benefits from visible health spending on hospitals; healthcare systems reward medical professionals for treating disease, not stopping it from starting; NGOs fighting similar diseases are competing for the same funding. Finland's famed North Karelia project suggests better alignment of interests is crucial to a successful "multi-sectoral" approach. This includes business. Finding a commercially viable way for the food industry to reduce salt in its products lowered average blood pressure in Finland—vital when around 80% of a typical European's salt intake comes from sodium put in by the food industry.

“Cardiovascular disease is the dominant epidemic of the 21st century.”

Dr Srinath Reddy,
president of
the World Heart
Federation

Introduction

A disease for all ages

CVD has been a major concern in developed countries since the mid-20th century. More recently the burden of the disease has grown rapidly in developing countries, turning it into a global problem and securing its position as the world’s leading killer. CVD was responsible for 30% of all deaths in 2010, up from 25% in 1990, according to the WHO’s Global Burden of Disease study, published earlier this year. Data on specific conditions, rather than categories of disease, paint a similar picture. In 2010, ischaemic heart

disease and cerebrovascular disease were the two biggest killers—as they had been in 1990.

With the human loss has come substantial economic damage. A joint study by Harvard School of Public Health and the World Economic Forum calculated the global cost at US\$863bn in 2010, projecting it to reach US\$1tn by 2025¹. Individual estimates of the total annual cost of CVD to the US and European economies around the same time stand at US\$290bn and

¹ DE Bloom et al., *The Global Economic Burden of Non-communicable Diseases*, 2011.

Table 1: World’s biggest killers - CVD retains top spot (and second place)

Change in 10 leading causes of death at global level (2008 - 2011)

Disease or injury	Total deaths (millions)* (2008)	Rank (2008)	Rank (2011)	Total deaths (millions)* (2011)
Ischaemic heart disease	7.25	1	1	7.02
Cerebrovascular disease	6.15	2	2	6.25
Lower respiratory infections	3.46	3	3	3.20
Chronic obstructive pulmonary disease (COPD)	3.28	4	4	2.97
Diarrhoeal diseases	2.46	5	5	1.89
HIV/AIDS	1.78	6	6	1.59
Lung cancer	1.39	7	7	1.48
Diabetes mellitus	1.26	8	8	1.39
Road injury	1.21	9	9	1.26
Hypertensive heart disease	1.15	10	11	1.06
Pre-term birth complications	1.00	13	10	1.17

*2011 estimates from Global Health Estimates (GHE) compared with previous WHO cause of death (COD) estimates for 2008.

Source: World Health Organization.

US\$273bn, respectively (or roughly 2% of GDP in both cases). “Governments in high, middle and low income countries are beginning to see that cardiovascular diseases will be an incredible economic burden,” says Dr Valentin Fuster, director of Mount Sinai Heart and physician-in-chief at The Mount Sinai Medical Center, as well as former president of the World Heart Federation.

aspirin and anti-platelets to those at high risk, are also associated with marked benefits. Dr Stephan Gielen, president of the European Association for Cardiovascular Prevention and Rehabilitation (ESCARDIO), says that statins alone account for roughly one-third of the decline in mortality from CVD over the last 20 years.

² PA Heidenreich et al., “Forecasting the future of cardiovascular disease in the United States,” *Circulation*, 2011; J Leal J et al. “Economic Costs,” in M Nichols et al., *European Cardiovascular Disease Statistics*, 2012.

The picture of this global burden is admittedly far from complete, particularly in the developing world where data about mortality rates are sometimes unavailable or less nuanced by regions or socio-economic status. Still, as Dr Reddy notes: “We have enough to know that it is a big problem.”

For some countries achieving such successes through prevention will be a necessity, not an option. Professor Walter Ricciardi, president of the European Public Health Association (EUPHA), warns that if certain developing countries do not focus more on prevention, “they won’t have the resources to take care of the sick people they will have.”

³ For a description of some of these studies, see Michael Kelly and Simon Capewell, “Relative contributions of changes in risk factors and treatment to the reduction in coronary heart disease mortality”, NHS Health Development Agency Briefing Paper, 2004. See also, ES Ford and Simon Capewell, “Proportion of the decline in cardiovascular mortality disease due to prevention versus treatment: public health versus clinical care”, *Annual Review of Public Health*, 2011.

If left unchecked, the range of conditions under the CVD umbrella (see *An introduction to cardiovascular disease*) will continue to result in debilitating disease and ultimately death on a large scale. This is unnecessary. Certain preventative interventions have already shown benefits that are individually substantial and collectively huge.

Yet in both the developed and developing world, plenty of scope remains for further risk reduction and greater use of cost-effective medical interventions. As Susanne Løgstrup—director of the European Heart Network, a coalition of heart foundations and patient organisations—says, “If we put in practice what we already know [about prevention], we would be doing very well indeed.” Professor Joep Perk, chair of ESCARDIO’s cardiovascular prevention implementation committee, goes further. After comparing his experience practising medicine in low and high CVD risk environments he concludes it is “a disease we simply don’t need to have.”

Most studies in developed countries attribute between 50% and 60% of the improvement in mortality from coronary heart disease over recent decades to lowering risk factors through primary prevention methods, such as reducing tobacco usage or changing diets. Secondary interventions, such as the prescription of statins,

An introduction to cardiovascular disease

The term “cardiovascular disease” covers a range of medical conditions affecting the heart and circulatory systems. Following the terminology of the Global Burden of Disease study, the two most common are:

Ischaemic heart disease: Also known as coronary heart disease, this arises frequently from a build-up of fatty materials in the circulatory system which impedes blood flow (atherosclerosis). It can ultimately lead to angina and/or heart attack (the two of which are sometimes collectively referred to as acute cardiac syndrome).

Cerebrovascular disease: This involves dysfunctions with the blood supply to the brain, often arising from damage to the circulatory system caused by hypertension (high blood pressure) or blockages from fatty materials. It can ultimately lead to stroke.

Less common conditions include:

Hypertensive heart disease: Heart disease arising from damage to the circulatory system due to hypertension. As high blood pressure can also contribute to ischaemic heart disease, this condition’s true impact may be underestimated.

Cardiomyopathy and myocarditis: Inflammation of the heart caused by viral, bacterial, fungal or parasitic infection.

Rheumatic heart disease: Heart disease acquired through heart damage arising from rheumatic fever, typically heart valve fibrosis. This is the most common acquired heart disease among children in many developing countries.

Atrial fibrillation or flutter: Irregular electrical signals from the brain impeding the ability of the heart to contract in a co-ordinated fashion and therefore to pump sufficient blood. It can arise from lifestyle but also from infection or certain medications.

Aortic aneurysm: Enlargement of the aorta which can lead to its rupture and, typically, rapid death. The causes are uncertain, but seem linked to smoking, hypertension, other heart disease and genetic factors.



By 2030 cardiovascular disease will account for a higher proportion of deaths in low- and middle-income countries than in high income ones.

WHO Global Health Estimates, 2013

1 Developed and developing risks

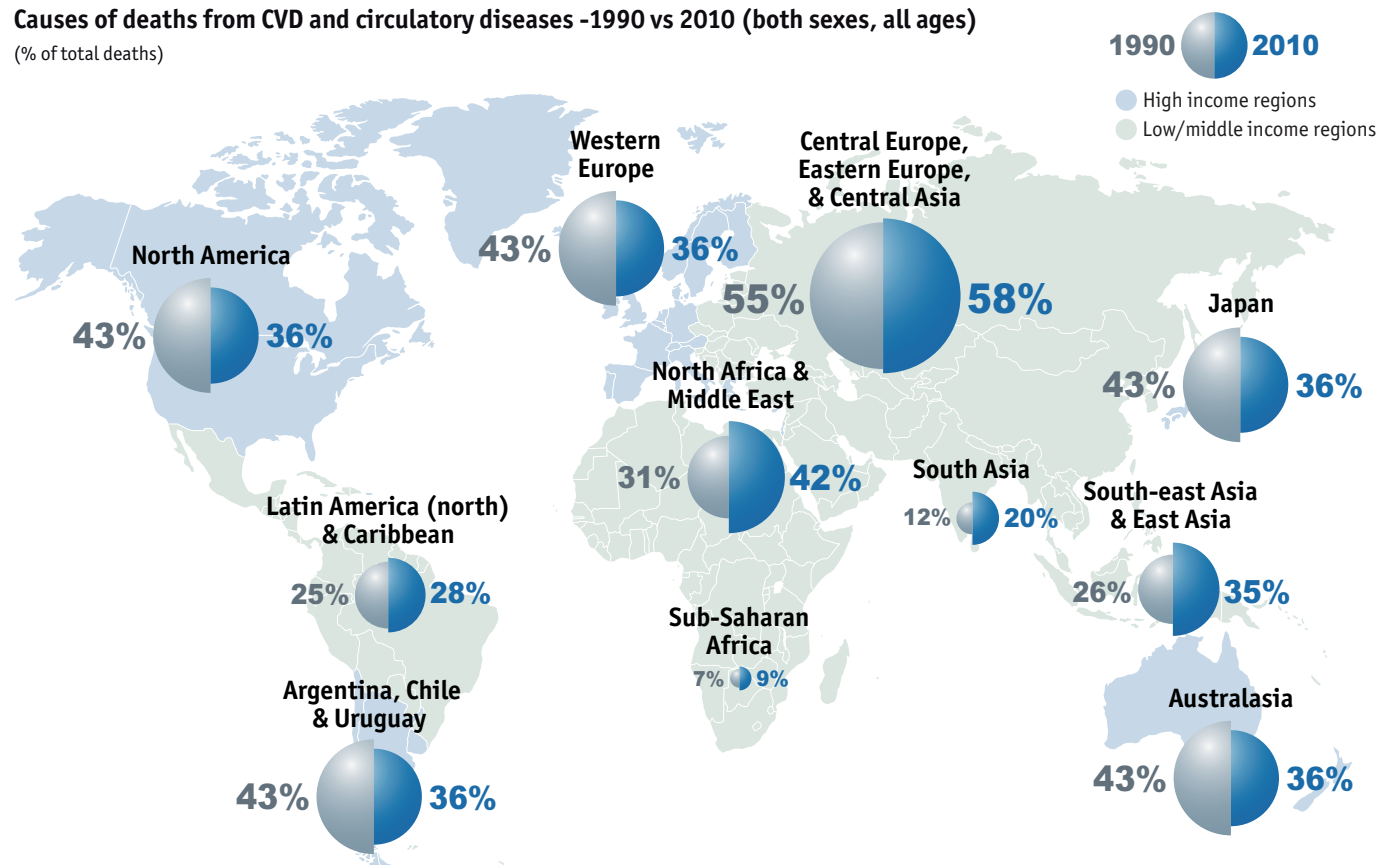
Even though CVD is a global disease, it affects countries and regions in different ways. The developed world has been long the most affected: coronary heart disease and stroke remain the leading killers in every high-income region of the world. Wealthy states have been seeing some positive progress, but the disease remains a formidable problem: CVD accounted for 43% of deaths in developed countries in 2010,

down from 48% in 1990, according to the Global Burden of Disease study. Dr James Morrow, a GP in rural England, notes that “cardiovascular disease forms an enormous part of my day-to-day work. It is at least one condition in 30% to 40% of the people I see. Over 20 years, we have been seeing many fewer acute events, but the number of people living with long-term conditions has gone up.”

Chart 1: Globalisation of cardiovascular disease

Causes of deaths from CVD and circulatory diseases -1990 vs 2010 (both sexes, all ages)

(% of total deaths)



Source: Institute for Health Metrics and Evaluation (IHME).

Table 2: BRIC countries are closing the gap on the US and Europe

Rates of death per 100,000 population caused by cardiovascular disease

	1990	2010	% change
Western Europe	458.48	366.79	-20
United States	391.26	303.19	-23
Brazil	179.92	206.03	15
Russia	633.85	830.77	31
India	139.20	171.07	23
China	189.87	233.70	23

Source: WHO *Global Burden of Disease study*, 2013.

The number of people living with the disease rather than dying from it could increase as a trend towards population ageing continues. Older populations do not inevitably bring increased overall rates of CVD—developed countries have brought down their CVD burden in recent decades even while the demographic ageing process took hold—but they will multiply the impact of other risk factors. Outside of Africa the proportion of those over 60 is rising quickly, but the trend is observed most noticeably in developed countries: the UN expects the proportion in this age group to grow from 22% to 30% between 2010 and 2035. The equivalent figures for developing countries are 9% and 16%, although there are some outliers. In China, for example, the proportion over 60 will rise from 12% to 27% during these years.

Developing countries face a different challenge. Traditionally their CVD burden has been insignificant and it remains lower than in high-income states. Yet the burden is on an upward trajectory. The total number of deaths from CVD has been rising in developing countries by 13% in the last two decades.

CVD caused a quarter of all deaths in 2010, up from 18% in 1990. Looking ahead, death from CVD will be more common in low- and middle-income countries than in high income ones by 2030, according to WHO projections. Part of this relative shift reflects a remarkable drop of 40%

in the developing world's rate of death from communicable diseases between 1990 and 2010.

The growing toll is most visible in Asia's demographic giants, where the disease burden is converging with the US and Western Europe (see Table 2). Looking wider, coronary heart disease and stroke are two of the top four causes of mortality in every region of the world outside of Africa. Nor is that continent exempt. As Dr Reddy points out, "When you look at age standardised mortality rates [from CVD], sub-Saharan Africa and the Middle East have the highest ones."

Beyond the diverging mortality rates, the impact of CVD is being felt differently in the developed and developing worlds. In the US and Europe, the challenge of CVD emerged over time allowing healthcare systems several decades to adjust, says Dr Shanthi Mendis, director ad interim, management of non-communicable diseases at the WHO.

By contrast its advent in developing states has been rapid, leaving countries with underdeveloped healthcare systems and competing priorities "not prepared to meet the challenge," according to Dr Mendis. What is more, the disease is hitting younger people harder in developing countries: Dr Reddy notes that "90% of CVD deaths globally among those under 60 are in low- and middle-income countries. That is a huge burden of early mortality with huge consequences for national development."

One area of global convergence, however, is an increasing shift of the disease burden onto the poor. The social gradient which CVD risk follows in developed countries—with the less well-off more likely to develop the disease—has long been recognised by researchers and may be getting worse in some⁴. Developing states are also seeing such a shift. Beatriz Champagne, executive director of the InterAmerican Heart Foundation, notes that for Latin America "poorer

⁴ See, for example, Pearson-Stuttard J et al., "Recent UK trends in the unequal burden of coronary heart disease," *Heart*, 2012.

people are showing the largest increases in heart disease," through lack of access to treatment and preventive measures. Dr Reddy adds that this is true in other developing regions too, posing a substantial equity challenge.

Paying for a Western lifestyle

The causes of CVD's rapid growth in developing countries and continued prevalence in developed ones are no mystery. Dr Lixin Jiang of the National Centre for Cardiovascular Diseases, Beijing, easily reels off a well-worn list to explain the growth of CVD in China: "the increasing prevalence of smoking, hypertension, high cholesterol, diabetes, obesity, inadequate physical activity, poor nutrition, air pollution and population ageing." The details vary slightly by geography—salt intake has more impact in some places, smoking in others—but the same risks explain most cardiovascular disease.

Data on these dangers remain poor in many developing countries, but what does exist suggests that they are either high or on the increase, or frequently both. According to the Global Adult Tobacco Survey, smoking is widespread, with over 40% of men regularly using tobacco in eight of the 14 low- and middle-income countries covered⁵. Other risk factors are heading in the wrong direction, although specific problems differ somewhat by region.

Africa has among the highest average levels of blood pressure in the world, and unlike developed countries it has seen a steady increase in both sexes since the 1990s⁶. Dr Kingsley Akinroye, former president of the African Heart Network, sees high salt intake and decreasing physical activity as helping to drive this trend. North Africa and the Middle East have some of the world's largest waistlines. Meanwhile, average body mass index (BMI) in East and South Asia has been climbing steadily⁷. This is particularly alarming because elevated CVD risk appears

to kick in at a lower BMI among ethnic Asians (especially Indians) than in other ethnic groups⁸.

The BMI and cholesterol figures suggest that dietary change accompanying economic development—in particular the adoption of higher fat, more Western foods—is driving up risk. Yet not all of these risks are solely down to individual behaviour. Rapid economic development in many emerging economies is bringing substantial environmental degradation along with air and noise pollution—all associated with higher CVD levels. Urbanisation, especially the unplanned variety common in emerging economies, brings people into closer contact with such pollution while increasing stress and decreasing physical activity—two other CVD risks.

The extent of some of these risks in developed countries provides a glimpse of the future—together with new risks on the horizon. According to the OECD, a rich world think-tank, over half the citizens of its member states are overweight or obese. Obesity frequently brings with it type II diabetes, which further raises CVD risk. Such self-induced risks, especially those that are obesity-related, have sparked concern that developed countries may even see a reversal in their declining levels of CVD.

There are, moreover, other lurking dangers associated with economic development, which are less visible and immediately obvious than the looming obesity crisis. Professor Perk reports a worrying "explosion of sleeping disturbances" among adolescents in Sweden using mobile communication technology late into the night. "That will translate into more atherosclerosis," he says. Similar observations in Australia suggest that the issue is more widespread than just in Sweden. As mobile phone ownership spreads to emerging markets—with Africa currently seeing very rapid growth rates—the problem may soon become one of developing countries, as well.

⁵ Gary A Giovino et al., "Tobacco use in 3 billion individuals from 16 countries: an analysis of nationally representative cross-sectional household surveys," *The Lancet*, August 2012.

⁶ Goodarz Danaei et al., "National, regional, and global trends in systolic blood pressure since 1980: systematic analysis of health examination surveys and epidemiological studies with 786 country-years and 5.4 million participants," *The Lancet*, February 2011.

⁷ Mariel Finucane et al., "National, regional, and global trends in body-mass index since 1980: systematic analysis of health examination surveys and epidemiological studies with 960 country-years and 9.1 million participants," *The Lancet*, February 2011.

⁸ Farshad Farzadfar et al., "National, regional, and global trends in serum total cholesterol since 1980: systematic analysis of health examination surveys and epidemiological studies with 321 country-years and 3.0 million participants," *The Lancet*, February 2011.

“We know a lot about what needs to be done, it just doesn’t get done.”

Beatriz Champagne,
executive
director of the
InterAmerican
Heart Foundation

2

Taking a fresh look at prevention

Health systems in developed countries typically dedicate only around 3% of spending to general prevention and public health—including vaccination programmes, according to the OECD and the WHO. Built around acute care, there is little or no financial incentive within these health systems for physicians to spend much time on health education and secondary prevention. Meanwhile, training in these areas is typically limited. In extreme cases, says Professor Perk, some medical professionals do not see prevention as their business because economic incentives reward only treatment. Realigning incentives is strongly linked with political willpower and funding yet similar hurdles apply here, too. Political leaders often see little advantage in promoting prevention. Health spending can be popular but politicians prefer spending that has a quick, visible impact, like a new hospital.

The political environment for CVD prevention has improved in recent years. International efforts, in particular the UN High-Level Meeting on NCDs in September 2011, various UN agency meetings to implement the summit’s political declaration, and the WHO Global Action Plan on NCDs adopted by the World Health Assembly in May 2013, certainly raised its profile. Alongside this, a number of proven, cost-effective healthcare system interventions exist for CVD prevention, as outlined in the WHO’s Global Action Plan (see *WHO knows: Drawing a road map for prevention*). A variety of studies have shown that national tobacco bans and weight loss programmes can yield dramatic results in a relatively short amount of time. But despite clear political progress,

experts describe the political will as “slack” and policymakers of being in “denial”.

The impact of these barriers to prevention can be glaring. A global study of over 150,000 people in 17 countries—the Prospective Urban Rural Epidemiology (PURE) study—found that overall “few individuals with cardiovascular disease took” any of a range of inexpensive, proven treatments. Of the medications studied, just a quarter of patients received the most common—anti-platelet drugs. Prescription rates partly reflected national wealth, but even in high-income countries only 62% took anti-platelet drugs and 66% statins, while one in nine received no drugs at all⁹. Professor Salim Yusuf, director of the Population Health Research Institute at McMaster University in Hamilton, Ontario, believes that the use of such interventions is “poor in rich countries, and very poor or abysmal in low income ones.”

Redefining the problem

As the burden of CVD remains high, some are beginning to take a fresh look at prevention, starting with a conceptual shift in focus. Medical prevention is sub-divided into categories, the two most relevant of which here are primary—avoiding occurrence of a disease—and secondary—stopping its progression, or reversing its course, in particular to avoid negative long-term outcomes. For CVD, the benefits of such distinctions are being brought into question.

⁹ Salim Yusuf, et al., “Use of secondary prevention drugs for cardiovascular disease in the community in high-income, middle-income, and low-income countries (the PURE Study): a prospective epidemiological survey,” *The Lancet*, 2011.

Primary and secondary prevention are very similar for CVD. Interventions such as improved diet or smoking cessation are highly important at any time. Similarly, elevated cholesterol is not itself a disease, but may call for the same treatment before or after CVD symptoms appear. Professor Perk, who chaired the committee writing the latest European guidelines on prevention, notes that it abandoned “the terms ‘primary’ and ‘secondary prevention’ because atherosclerosis is a continuous process. Why wait to make an artificial distinction? Instead we talk about different levels of cardiovascular risk.”

Another—more practical—adjustment for CVD prevention is the need to co-ordinate the growing range of potential actors involved. At the government level, health education in schools is an obvious element to include in a strategy, but the list quickly expands to food ministries encouraging lower fat consumption, through urban planners making walking easier, to many others. As Professor Ricciardi puts it, “In principle every cabinet minister is a minister of health and any decision affects healthcare.”

Civil society also has a potential role in prevention. Dr Douglas B. Clement, chair of the Heart and Stroke Foundation of Canada, an NGO, explains that his organisation has in recent years increased its focus on prevention, through research, tools and programmes supporting individuals in preventing CVD. Religious groups in the US are increasingly engaging in local, prevention-focused healthcare outreach. Workplace employee health programmes and individual dieters are conceptually part of prevention too. Such a variety of actors bring clear benefits, from turning the minimisation of risks into a societal goal rather than a purely medical issue, to sharing the financial burden of cash-strapped governments. The sticking point here is the co-ordination of these numerous groups, which is often lacking.

Self-help or self-harm

Still, some of the most enduring and alarming barriers to prevention exist at the individual level. People do not have a good track record with prevention, despite the seemingly obvious self-interest. This is true even among patients most at risk. The PURE study found that, of those who had suffered a heart attack or stroke, only 35% took up a high level of exercise and 39% a healthy diet, while 19% continued to smoke¹⁰.

Psychology plays an important part here. As humans we generally protect ourselves from failure so we are wary of pursuing changes that we are unlikely to succeed with, explains Dr Catherine Sykes, a researcher in the health psychology department at City University, London. Added to this, we underestimate our own risks from disease, such as cancer or CVD, as we routinely disregard or reinterpret information to suit personal behaviour.

Even a regular smoker, fully informed about the potential risks from cigarettes, can rationalise unhealthy behaviour by making favourable comparisons to a peer or friend who perhaps smokes more often. This behaviour applies across the lifestyle spectrum. According to Dr Sykes, the introduction of red, orange and green traffic light labelling to food to indicate levels of risk could simply result in consumers treating three “oranges” as relatively healthy when compared to one red.

After a CVD event, other psychological influences come into play. There is a general arc for lifestyle-related long-term conditions, says Dr Sykes. Behaviour change is not adopted straightway, it picks up in the middle, before returning back to normal. Depression and anxiety are the main emotions here, neither of which is conducive to rehabilitation and lifestyle change.

¹⁰ K Teo et al., “Prevalence of a healthy lifestyle among individuals with cardiovascular disease in high-, middle- and low-income countries: The Prospective Urban Rural Epidemiology (PURE) study,” *Journal of the American Medical Association*, 2013.

Table 3: Not following the script**Adherence rates to common cardiovascular medications**

Medication	Self-reported adherence (%)	Consistent adherence (%*)
Aspirin	83	71
Lipid-lowering agents	63	46
Beta blockers	61	44
Aspirin + beta blockers	54	36
Aspirin + beta blockers + lipid lowering agent	39	21

*More than 2 consecutive follow-up surveys over 6 to 12 months

Source: Medication Adherence in Cardiovascular Disease, Steven Barotelli and Heather Dell'Orfano, *Circulation*, 2010

¹¹ Steven Baroletti and Heather Dell'Orfano, "Medication Adherence in Cardiovascular Disease", *Circulation*, 2010.

¹² See, for example, Shah Ebrahim, et al., "Multiple risk factor interventions for primary prevention of coronary heart disease", *Cochrane Database of Systematic Reviews*, updated January 2011; SM Carr, "An evidence synthesis of qualitative and quantitative research on component intervention techniques, effectiveness, cost-effectiveness, equity and acceptability of different versions of health-related lifestyle advisor role in improving health", *Health Technology Assessment*, 2011; Linda Cobiac, et al., "Which Interventions Offer Best Value for Money in Primary Prevention of Cardiovascular Disease?", *PLoS ONE*, July 2012.

A similar resistance is true for adherence to drugs prescribed to reduce risks. Other than for aspirin, a majority of patients fail consistently to take them as directed (see Table 3)¹¹. Professor Yusuf explains that "when people are discharged the majority are on reasonable medications but in a short time this is discontinued."

Failed adherence to treatment is split into two categories: intentional and non-intentional. Text messaging and other technology developments can assist with people forgetting to take medication—the so-called non-intentional failures. The more complex issues surround the patients who decide not to take medicine when a host of factors interfere: from cost of treatment to beliefs about the medication and the illness. Individuals frequently stop taking drugs prescribed for prevention after they feel better and think themselves cured, says Professor Yusuf. Even some medical professionals do not understand the need for continuing to take certain heart medicines indefinitely, he notes.

Sustainable prevention

Devising a strategy to prevent a lifestyle-driven, optional disease is complicated. On the one hand, the complexity of human beings means that interventions aimed at behavioural change must first understand how each individual appraises

illness and appraises risks. In Dr Syke's view, this can only be conducted effectively at the individual level. On the other hand, literature surveys indicate that one-to-one education or counselling of patients yields either an insignificant or a small impact on risk levels and mortality, at a relatively high cost in terms of health system money and time¹².

For some experts, moreover, the measure of success or failure of CVD prevention initiatives should not stop at health outcomes and returns on investment. Dr Mike Rayner, director of the British Heart Foundation Health Promotion Research Group, believes that future solutions have to be sustainable from wider economic, societal and environmental perspectives, too. After all, banning all fizzy drinks could easily lead to massive job losses, just as shifting social norms away from cheese and red meat to fish will create an even greater threat to global fish stocks.

Yet one thing is for certain: prevention efforts have to evolve to be more effective in future. The InterAmerican Heart Foundation dropped its previous programmes for individuals to focus on societal change because today's obesogenic society makes it near impossible to avoid poor lifestyle choices. "Prevention in the way that we normally think of it—just a doctor telling a patient to quit smoking and eat right—is in the past," says Ms Champagne.

WHO knows: Drawing a road map for prevention

In May 2013, the World Health Organization (WHO) adopted an action plan to prevent and control non-communicable diseases (NCDs), including cardiovascular disease (CVD). To help meet the WHO's global target of a 25% reduction in deaths worldwide from NCDs by 2025, the action plan sets out eight targets which it encourages countries to adopt voluntarily. These include a 30% reduction in smoking and salt intake, and at least 50% of eligible people receiving drug therapy and counselling to prevent heart attacks and strokes. Success will be measured using a set of 25 specific indicators outlined in the document.

The difficulty comes from turning these laudable goals into more than simply pious hopes, especially for low-income countries with few resources for healthcare. For Dr Shanthy Mendis, director ad interim of management of non-communicable diseases at the WHO, "The importance of the action plan is that it presents to all countries a menu of options, giving them the freedom to choose according to their national contexts. The options are based on evidence with cost effectiveness and affordability taken into account."

In particular, the plan highlights 13 measures that it calls very cost-effective, because of

solid evidence indicating that they provide an extra year of healthy life for a cost below the average annual income in a low-income country. Most involve education or regulatory and tax measures directed against tobacco and alcohol, but the list also includes certain standard generic drug therapies for people at high risk of CVD or post-heart attack. Dr Mendis notes that each of the very cost-effective measures "are affordable for practically all countries. Some countries always say that they have no resources, but they can make a start with what they have."

The action plan recognises that certain countries will not be able to bring about these changes alone. It highlights the necessity for North-South, South-South, and triangular technical co-operation, including on setting up the data measurement capacity to track progress toward targets. This hoped-for co-operation includes development aid for low-income countries, but the WHO model is looking beyond greater dependence. "Work on NCDs can't be based on aid from outside because of lack of sustainability," says Dr Mendis. "Countries will need to adapt the implementation of the action plan to their circumstance. That is why it is important to prioritise."

“Action at the country level will decide the future of the cardiovascular epidemic.”

Dr Shanthi Mendis, director ad interim, management of non-communicable diseases, WHO

3

Fighting the disease on all fronts

In 1985, epidemiologist Geoffrey Rose argued that reducing risk factors across a whole population was superior to dealing solely with high risk individuals, because a significant proportion of cases of disease normally arise among those at average or even low risk. Since then, the central role of population prevention has become accepted orthodoxy in the area of CVD.

More recently it has been suggested that population-level actions may reduce the socio-economic inequalities of the disease. A 2010 evidence review found that screening, advice on diet and smoking, and prescription of preventative drugs all exacerbate differences between rich and poor, while population-wide measures such as smoke-free public places and the banning of trans fats did the opposite¹³.

Many interviewees for this report consider this to be the type of intervention with the highest potential for dividends, in part based on a shared perception of why prevention efforts focused on the individual often fail. These range from the personal challenge of affecting lifestyle changes, even among informed individuals, to the institutional impediments that place some significant choices beyond individual control altogether; for instance, about 80% of a typical European’s salt intake comes from sodium put in by the food industry, notes Dr Pekka Puska, director general of Finland’s National Institute for Health and Welfare.

Broadly speaking, the focus of population-level prevention is on the creation of an enabling

environment in which people can make and maintain healthy choices. Yet it is impossible to take the individual out of the equation. Population-level prevention must seek popular approval. This is evident from the difficulties surrounding so-called “fat taxes”, or more focused “soda taxes”, which are increasingly advocated to address growing obesity, notwithstanding the literature on their likely effectiveness: a recent BMJ analysis found that to affect levels of obesity and heart disease would take taxes of at least 20% on unhealthy food¹⁴.

In 2011, Denmark imposed a tax on all foods containing more than 2.3% saturated fat. The tax never had a chance to prove itself: within a year, the unpopular levy had been abolished. Whether or not it was effective—a 10-20% drop in butter and margarine sales during its first three months may reflect changing habits or stocking up before its imposition—Danes worked around it in order to keep their diet the same. Cross-border shopping rose by 10% in the year the tax was in effect, according to Danish government figures. Much of this is likely to have involved the commonly observed practice of families buying their fatty food in Germany or Sweden.

Therefore, top-down population prevention is not a complete solution: changing social norms need to be considered alongside bringing in taxes. Health systems matter tremendously, too. Data from the PURE study demonstrate this in a striking way. An interim analysis released in September 2013 found that although CVD risk is highest in high-income countries, mortality

¹³ Simon Capewell and Hilary Graham, “Will Cardiovascular Disease Prevention Widen Health Inequalities?” *PLoS Med*, August 2010.

¹⁴ Oliver Mytton, et al., “Taxing unhealthy food and drinks to improve health,” *BMJ*, April 2012. See also, Lisa Powell, “Food Prices and Obesity: Evidence and Policy Implications for Taxes and Subsidies,” *Milbank Quarterly*, March 2009.

rates are more than five times lower than in low-income states¹⁵. The explanation for this is the lack of good health systems for prevention, says Professor Yusuf, who led the study: widespread smoking cessation, hypertension control and secondary prevention in high-income countries more than compensates for higher risks.

Evidently, prevention should be looked at from multiple sides, involving multiple actors and considering multiple interventions. How change occurs, or does not, on three fronts—the population, the health service and the individual—will define the future of CVD prevention.

(I) Population prevention: Smoking, salt and saturated fats

Prevention became part of cardiology around 50 years ago with growing acceptance of the link between smoking and heart disease. The “eternal fight against tobacco”, in Professor Ricciardi’s words, is ongoing, but successes over the decades lead health advocates frequently to point to this battle as an exemplar for others. Typically tobacco control programmes involve a range of measures including education, smoking bans and taxes. These are common in the developed world, but need not be restricted to wealthier countries. As Dr Reddy points out, “decreasing tobacco-free places does not cost money and taxes can raise it.”

Dr Reddy and others point to Thailand as an example of what a middle-income country can do. Driven by local NGO pressure, in the early 1990s the government established a set of controls, frequently updated since, including advertising bans on tobacco products, health warning labels, bans on smoking in public places and excise taxes. The results showed a marked drop in smoking among males from, according to the WHO, 59% in 1991 to 42% in 2007. Female smoking prevalence also dropped, from 5% to 2%, but was never high. Figures from the *Global*

Burden of Disease study suggest a strong health benefit over the same period, experienced by more than three times more males than females.

Taxation, however, has a less straightforward effect on smoking, perhaps explaining why it has slightly less of an overall health impact than non-tax measures¹⁶. By driving prices higher, taxation reduces the number of people, especially the young, who take up smoking. But the impact on adult smokers is less clear cut. While the WHO, among others, says that increased taxes reduce smoking in that group, they do not always. A large US study found that substantial cigarette tax increases in recent years in that country had at most a small, statistically insignificant, impact. Similar research in Spain also found no change in use, although it saw a shift to untaxed, roll-your-own cigarettes¹⁷. Other unintended consequences also arise: cigarette smuggling and tobacco duties often correlate.

Season to taste

High salt consumption leading to hypertension is similarly linked to CVD risk factors. Since the early 1980s, the Finnish government has required certain common foodstuffs, such as cheese and bread, containing more than a prescribed level of sodium to carry warning labels; those below a lower limit can carry a low-salt label. As a result, food companies reformulated their products: salt levels in bread, meat products, cheeses and ready meals have dropped by one-fifth to one-quarter since the early 1990s. More recently, the government has imposed sodium limits on certain foods which receive state or EU subsidies, such as milk for children or meals in university halls of residence.

The results have been positive. Between 1977 and 2007, estimated salt consumption among Finnish men dropped from roughly 16 g/day to 8.3, and that among women from around 10 g/day to 7 (albeit still above the WHO’s recommended 5 g/

¹⁵ Salim Yusuf, “PURE: Contrasting associations between risk factor burden, CVD incidence and mortality in high, middle and low income countries,” Presentation, European Society of Cardiologists Conference, September 2013.

¹⁶ Perviz Asaria, et al., “Chronic disease prevention: health effects and financial costs of strategies to reduce salt intake and control tobacco use,” *The Lancet*, December 2007.

¹⁷ Kevin Callison and Robert Kaestner “Do Higher Tobacco Taxes Reduce Adult Smoking? New Evidence of the Effect of Recent Cigarette Tax Increases on Adult Smoking,” NBER Working Paper No. 18326, August 2012; Ángel López-Nicolás, et al., “Will the European Union’s New Tobacco Tax Legislation Lead to Reductions in Smoking Prevalence? Evidence from a Quasi-experiment in Spain,” *Nicotine & Tobacco Research*, February 2013. See also Michael Palinkas, “Are Cigarette Excise Taxes Effective in Reducing the Habit?,” *Public Purpose*, Spring 2011.

day). During that same period, average blood pressure and CVD mortality also declined. Given that alcohol consumption and average BMI rose in those years, salt reduction is likely to explain much of both declines¹⁸. A great strength of the salt reduction programme has been co-operation. Dr Puska notes that its “success is closely related to the food industry changing its products.” However, a more coercive approach can backfire, such as the more recent Danish “fat taxes”. One poll found that 70% of Danes thought the tax to be a bad idea¹⁹.

Initially unpopular or didactic measures are possible to implement in some instances. New York City’s restrictions on the use of trans fats in restaurants, initially opposed by owners, have been highly successful. Yet population prevention cannot succeed in the face of ongoing, widespread opposition. It is a highly political act, and must be shaped accordingly. Where it is seen as genuinely empowering citizens, it can have a huge impact, as with tobacco; where it resembles coercive paternalism, it will resemble North America’s experiment in alcohol prohibition, and it is likely that it will face the same fate.

(II) Health system prevention: from pills to tablets

Alongside population-level measures, health systems will need to evolve in order to support CVD prevention better. Change could begin with the current doctor-centric approach to a disease that eventually affects one-third of the adult population. Doctors are expensive assets to deploy in the developed world, while in many developing countries there are simply not enough physicians to go around. Worldwide, healthcare systems should embrace a greater role for non-physicians. Such an evolution is already occurring in general within medicine, taking a variety of forms, although progress is slow.

In developed countries, for example, nurse practitioners—highly trained nurses who

typically can prescribe certain drugs and often specialise in particular conditions—are increasingly common: in the US their number rose by 40% between 2007 and 2012. Meanwhile in India the government has put in place 880,000 Accredited Social Health Activists (ASHAs) since 2005—local women in rural villages given basic medical training who can provide first aid, some simple treatments and referrals to other relevant healthcare providers.

Both examples, although far apart in terms of training and role, show a trend toward widening types of interaction with the patient. CVD care is no exception to this trend and its medical outcomes have been positive. A British study found that care management by cardiac specialist nurses reduced hospitalisations by 35%; a US study found the involvement in care of cardiac nurse practitioners and community health workers helped substantially reduce blood pressure and cholesterol levels²⁰.

Technology developments should accelerate this shift, at a potentially low cost. The Nigerian Heart Foundation sends out text messages with basic heart-related information throughout September, in conjunction with mobile operator MTN. The spread of wireless and mobile technology around the world promises much more beyond this.

The Swasthya Slate, a project of the Public Health Foundation of India (PHFI), is a specialised tablet computer that allows a health worker, such as an ASHA, to perform 33 different diagnostic tests—including an electro-cardiogram—the results of which are then sent directly to a specialised data cloud. Software in the machine also allows it to provide on-the-spot diagnoses and decision support.

Billed by Dr Reddy as a possible “game changer” for NCD care in India, the machinery is currently undergoing field trials. The PHFI estimates that, if mass-produced, all the equipment needed in

¹⁸ FJ He and GA MacGregor, “A comprehensive review on salt and health and current experience of worldwide salt reduction programmes,” *Journal of Human Hypertension*, 2008.

¹⁹ Søren Gade and Jens Klarskov, “A tax everyone wants to see cut,” *The Copenhagen Post*, October 4th, 2012.

²⁰ J Pattenden, “Heart Failure Specialist Nurses: Feeling the Impact,” *British Journal of Primary Nursing Care*, October 2008, JK Allen, et al., “Community Outreach and Cardiovascular Health (COACH) Trial” *Circulation: Cardiovascular Quality Outcomes*, September 2011.

addition to a basic tablet computer would cost roughly US\$250 per device. Small pilot studies suggest it can be used with even limited training.

In addition to more effective use of personnel, health services—especially in developing countries with restricted means—should consider ways to use existing assets more effectively. One approach that is attracting interest currently is the use of specialised clinics in low- and middle-income countries—notably those set up to address the HIV/AIDS epidemic—to expand their services to include testing and treatment for a range of NCDs, including CVD.

This is not a new idea: Cambodia ran a successful trial of the concept in 2002–05, but as the profile of NCDs has increased it has seen a growth in interest. In 2011, for example, a joint public private partnership began using HIV facilities set up under the US President's Emergency Plan for AIDS Relief as locations for cervical and breast cancer screening. A number of pilot projects in Africa have seen varying degrees of success. The broader lesson of these seems to be that there is no single best strategy for adding NCD services to HIV clinics, but that local knowledge built up at the latter can be applied to the screening and treatment of a range of conditions with the proper investment of time²¹.

Take it easy

A different, more controversial, option to facilitate a shift away from doctor-centric prevention is to prescribe risk-lowering medication to the entire population over 50 or 55 years of age. There are some solid arguments for doing this. As noted earlier, health systems are moving conceptually towards a risk-based approach to CVD prevention, which inevitably entails some sort of risk screening. The most widespread methodology is the Framingham Risk Score, which considers various factors in assigning a ten-year risk score. A recent analysis,

however, found similar effectiveness (and cost savings) simply by treating the entire population aged over 55 as high risk²².

Providing CVD medication to the entire population in this age group is estimated to cut cardiovascular disease by 80%²³, as well as avoiding ineffective screening. Added to this, the medication could be delivered as one single pill rather than several. The WHO has encouraged development of a fixed dose combination (FDC) or polypill for over a decade. This combination of several medications already frequently taken together has proved a useful tool in HIV treatment, while a recent study suggests adherence to FDCs by CVD patients is higher than that for multiple pills (the rise was 23% to 77% among those with previously low adherence)²⁴.

The arguments against this radical intervention range from costs to potential side effects. Ultimately, however, this intervention will only treat the individual rather than change the basic underlying lifestyle problems of CVD. With population prevention, Dr Reddy explains, “the next generation will be less likely to be at risk, but with the pharmacological approach, you will only perpetuate bad conditions. We need drugs but they won't fix everything.” As younger people are increasingly showing higher risks of CVD, the longer-term scenario could see children as young as eight put on statins—as the American Academy of Pediatrics recommended in some cases.

(III) Individual prevention: changing the doctor-patient paradigm

The extent of CVD prevalence means that prevention must go beyond activities by healthcare systems, warns Professor Yusuf. “In Africa,” he notes, “you don't have a sufficient number of doctors or nurses to control hypertension. You need innovative models where even what nurses do can be shifted down [to others].” The answer here may come in part from

²¹ Peter Lamptey and Rebecca Dirks, “Building on the AIDS response to tackle non-communicable diseases,” *Global Heart*, 2012; Bart Janssens, et al., “Offering integrated care for HIV/AIDS, diabetes and hypertension within chronic disease clinics in Cambodia,” *Bulletin of the World Health Organization*, 2007; Miriam Rabkin, et al., “Strengthening Health Systems for Chronic Care: Leveraging HIV Programs to Support Diabetes Services in Ethiopia and Swaziland,” *Journal of Tropical Medicine*, 2012.

²² Nicholas Wald et al., “Screening for Future Cardiovascular Disease Using Age Alone Compared with Multiple Risk Factors and Age,” *PLoS One*, May 2011.

²³ See, for example, Nicholas Wald and Malcolm Law, “A strategy to reduce cardiovascular disease by more than 80%,” *BMJ*, June 2003.

²⁴ Simon Thom, et al., “Effects of a Fixed-Dose Combination Strategy on Adherence and Risk Factors in Patients with or at High Risk of CVD,” *JAMA*, September 2013.

the roll out of a plethora of telemedicine tools in recent years, for measuring physical activity, blood pressure and heart rate. A Taiwanese study of a telehealth programme—which included both the instantaneous communication of various relevant health metrics measured in the home to medical professionals and the capacity for interaction between patient and healthcare providers—found it cut hospital admissions and time spent in hospital among CVD patients. These changes more than paid for the programme itself, making it a money saving intervention²⁵. Dr Gielen refers to telehealth as “the biggest [recent] step forward in perpetuating healthy lifestyle habits.”

The growth of telehealth in CVD leads inevitably to what role the patient might play. In health systems, power has traditionally rested with the provider, not the patient. Here again, the beginnings of a slow shift seem visible. In the late 1990s, certain US facilities developed the so-called Chronic Care Model (CCM), which has since spread internationally. Fundamentally this involves turning a passive patient into an active, educated player alongside the treatment team. In a majority of cases of chronic disease, the optimum result is supported self-management rather than medical personnel taking the lead. One early evaluation by RAND Health found that congestive heart failure patients in a CCM programme spent 35% fewer days in hospital.

The CCM is just one of many ways a patient’s role in disease management could increase. Dr Fuster reports that he is engaged in an experiment in Spain in which CVD patients are divided into two counselling groups, one counsellor-led and the other a patient-led group along the lines of Alcoholics Anonymous. His preliminary data indicate that the patient-led group is having better results. Giving patients greater influence over treatment decisions could also improve

adherence to medication or lifestyle change. A 2011 Mayo Clinic review of CVD adherence literature, for example, notes: “The more empowered patients feel, the more likely they are to be motivated to manage their disease and adhere to their medications.”²⁶

Control shift

It would be wrong to present the active participation of patients in their CVD management as a silver bullet to the general problems of non-adherence or prevention. The pressing issue, however, may be how willing medical practitioners are to share power in case management. A low-cost, over-the-counter polypill could democratise prevention. Similarly, new apps and devices attached to mobile phones are allowing personal health monitoring (mHealth) to go far beyond measuring temperature and weight. Such increased capacity for personal monitoring could make many healthcare providers and professionals very uncomfortable.

A 2012 global survey for a UK-based consultancy, PwC, found that 42% of doctors, including 53% of younger ones, worry that mHealth will make patients too independent. Meanwhile, only 27% of doctors recommended mHealth apps to patients²⁷. Only last year, the Queen’s Nursing Institute in the UK wrote, “There are practitioners who refuse to use information technology; and decline to offer their patients home monitoring equipment on the assumption that they won’t be able to manage it.”

Individuals actively pursuing their own better health should be a central goal of CVD care: finding ways for technologically-enabled individuals to interact with health systems to best effect remains a work in progress.

²⁵ Ying-Hsien Chen, et al., “Clinical Outcome and Cost-Effectiveness of a Synchronous Telehealth Service for Seniors and Non-seniors with Cardiovascular Diseases: Quasi-Experimental Study,” *Journal of Medical Internet Research*, April 2013.

²⁶ Marie Brown and Jennifer Bussell, “Medication Adherence: WHO Cares?,” *Mayo Clinic Proceedings*, April 2011.

²⁷ *Emerging mHealth: Paths for growth*, PwC, June 7th 2012.

“The general degree of co-operation is a problem—between doctors and specialists, between insurers and physicians; you can include everybody you can think of.”

Dr Lutz Herbarth,
leader of individual
health management
at KKH Allianz
Insurance

4

Keys to collaboration

The WHO’s action plan against NCDs contains provisions for the establishment of a Global Co-ordination Mechanism to improve co-operation between, among others, the WHO, member states, the UN and other international bodies, in combating NCDs and addressing gaps where they become apparent. This initiative reflects a rapidly growing trend in CVD and NCD prevention more generally as it becomes increasingly apparent that addressing these multi-faceted problems requires greatly enhanced collaboration.

The governance section of WHO Europe’s new Health 2020 framework provides guidelines on a whole-of-government approach to health and its determinants. The Irish government has been the first to draw up policies to put these goals into practice. Its Healthy Ireland Framework includes several relevant proposals. Although the Ministry of Health will take the lead, the Cabinet Committee on Social Policy will oversee implementation of the overall framework, including its prevention goals.

Moreover, every government department will create a policy unit that interacts with the health ministry’s Health and Wellbeing Unit “to produce integrated, co-ordinated intersectoral plans to address risk factors and social determinants of health.” Meanwhile, a new Healthy Ireland Council will attempt to foster co-operation with other stakeholders outside of government. Launched in March 2013, it is still too early to see how successful these ambitious plans will be.

Sharing is caring

The need for change is visible at any number of levels, not just between governments and international bodies. Dr Clement notes that various NCD-focused NGOs in Canada—such as those concerned with heart disease, stroke, diabetes and cancer—are increasingly promoting the same behaviour changes. He says a major barrier to co-operation is the competitive nature of philanthropic fundraising in healthcare; NGOs see only competition where they should see collaboration. “Somehow, there is going to have to be a union of these organisations in these efforts, but it has yet to occur,” he says.

Despite the difficulties, NGO co-operation at the international level is already bearing fruit. In 2009, the World Heart Federation, the International Diabetes Federation, and the Union for International Cancer Control created the Non-Communicable Disease (NCD) Alliance; the International Union Against Tuberculosis and Lung Disease joined in 2010. The grouping has largely focused on mobilising civil society in the political arena, and its efforts were instrumental in bringing about the 2011 UN summit on NCDs, which in turn led to the 2013 WHO Action Plan on these conditions.

Other global alliances are appearing. The Global Alliance for Chronic Diseases, established in 2009, brings together funding agencies from a range of developed and developing economies. These bodies represent 80% of public health

research funding worldwide. Their mission includes co-ordinating research into chronic disease prevention. Dr Fuster reports that the alliance is “having a tremendous impact and appears poised to take the lead in CVD capacity building and research,” a result arising from a willingness to work together rather than “enlarging their turf”. Meanwhile, efforts are under way to create a Global Alliance for Cardiovascular Disease Prevention in Clinical Practice.

United front

Still, these efforts mainly involve co-operation between similar organisations. The enduring legacy of perhaps the most successful CVD prevention project (see *Lessons on collaboration from North Karelia*) is the importance of a collaborative approach across interest groups. An interesting recent application of this multi-stakeholder collaboration is the Million Hearts Initiative in the US set up by the Department for Health and Human Services and co-led by two of its sub-units, the Center for Disease Control and Prevention and the Centers for Medicare and Medicaid Services. Its goal is to provide a focus for promoting a range of primary and secondary prevention activities by partners across the public, private and social sectors in order to prevent a million heart attacks between 2011 and 2017.

The combination of this simple, easy-to-grasp goal, alongside a very specific time line, has helped unify the efforts of public health and healthcare professionals, says Dr Janet Wright,

the initiative’s executive director. It has also created a common focus for a broad collection of other partners, including individuals affected by CVD, employers, insurers, pharmacists, community and faith-based groups, and a variety of federal government agencies. “Essentially, we are providing a forum,” says Dr Wright. “Although there is a common goal, there are multiple pathways depending on the nature of the organisation. We plant a flag and say, ‘here are some things that others are learning’. I thought we would be coming up with these interventions but the major work is to gather the lessons learned of many groups and disseminate their best practice.”

The initiative has until 2017 to run, and does not yet have interim figures to measure against its goal. To judge by reaction to it, however, it is meeting a demand. Between January 2012 and May 2013, more than 15,000 individuals and organisations pledged their support to Million Hearts. Of the public and private organisations involved, 60 made specific, actionable commitments for CVD prevention. “We have been stunned with the uptake and interest and how quickly people grasp the concept and see the role that they play,” says Dr Wright. “Every individual was hungry for action.”

Just as not every medical intervention is cost effective, not every collaboration effort will prove fruitful. Yet with so many started in recent years, what works to allow this hunger for action to overcome misaligned interests should soon become clearer.

Lessons on collaboration from North Karelia

One of the best known population-level prevention programmes took place in the North Karelia region of Finland: around 40 years ago the area's population suffered from very high rates of non-communicable disease (NCD), even compared to Finland's very high levels of the time. In 1972, an initiative involving local and public health officials as well as academic experts took aim at the region's underlying NCD risks. This North Karelia Project adopted a whole population approach that included not just education but also efforts to change the social and physical environment in ways conducive to health. The five-year trial proved so successful that its lessons were rolled out across Finland and the country continues to benefit.

An integral feature was the successful co-ordination of a wide number of stakeholders, including health professionals, media, schools, supermarkets, food producers and local housewives.

This was a marked innovation. "We were young, enthusiastic, and a bit heretical," recalls Dr Pekka Puska, director general of Finland's National Institute for Health and Welfare, who helped create and lead the project. "We saw that lifestyle change could not be solved by health service methods. Information is not enough. You need to involve and work with the whole community."

But it was not easy. Every community, he says, has advantages and disadvantages for encouraging joint action. In North

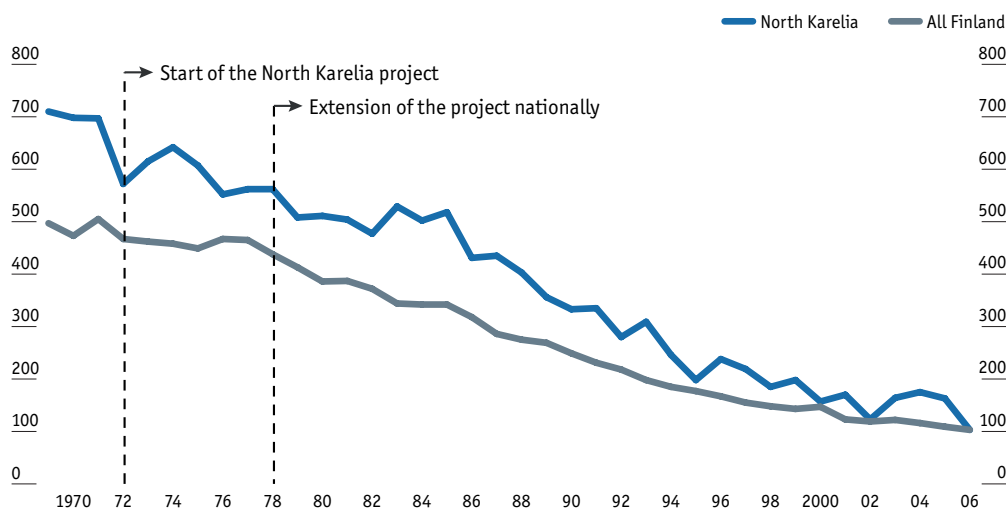
Karelia's case, the population was fairly homogeneous but, typical of rural communities, innovation could excite cultural resistance. "We had big fights," Dr Puska recalls. Looking back, he sees two widely applicable lessons on stakeholder co-operation from the North Karelia Project. First, "Identify the practical things you want people to do that will give win-win situations." While participating in such a project, private sector companies still have to do business and government administrators also need to see benefits for their own jobs. Food companies and supermarkets in North Karelia were involved in the effort to encourage consumer demand towards healthier products. This allowed them to prepare for, and subsequently benefit commercially from, these shifting habits. The second lesson, says Dr Puska, is the importance of personal contact. "You have to go around, meet people, and get their respect and friendship," he says.

The project's wider lessons are still being studied and applied around the world²⁸.

Chart 2: Finnish CVD - legacy of the North Karelia project

Age-adjusted mortality rates of coronary heart disease (CHD) in North Karelia

(mortality per 100,000 population)



Source: National Institute for Health and Welfare/North Karelia Project Foundation.

²⁸ For a detailed history of the project and its impact, see Pekka Puska, et al. eds., *The North Karelia Project: From North Karelia to National Action*, 2009.

Conclusion

No government, society or individual can safely ignore CVD. Efforts to combat the disease in the developed world have achieved undeniable progress, yet after some decades it remains the leading killer in many of these countries. Meanwhile, the rapid growth of CVD in the developing world underlines its status as the dominant epidemic of the 21st century. Soon the CVD centre of the world may move away from the West, along with economic dominance. The former should be more of a concern than the latter.

One or two reasons behind the epidemic are otherwise positive: population ageing is actually a triumph of healthcare, while few would regret the automation of certain manual tasks, whatever the physical exercise they once gave. Most of the risk, however, is entirely avoidable. Lifestyle choices with negative health consequences are the main driver of CVD. However frustrating this knowledge is for medical professionals, it at least opens up a huge opportunity for prevention-focused interventions.

Every country will need to find its own best strategy for prevention but a number of broadly applicable themes have appeared repeatedly:

- **Do not ignore easy wins:** Prevention is a huge field and the cost-effectiveness of certain interventions remains unproven. This should not stop even low-income states and health systems from implementing the options which are known to work. Public smoking bans, for example, cost little and can have a substantial impact in less than a year.

- **Look at a range of options:** Interventions exist at any number of levels. Experts largely agree that population-level prevention will have to play an essential role in stopping the growth of CVD, but it is not the only tool. Effective prevention may even involve changes which go far beyond CVD, such as restructuring who provides care in health systems or changing the role given to individual patients in managing their own conditions.

- **Seek coherence and collaboration:** Prevention of CVD does not lack committed stakeholders or possible interventions. Too often, however, things do not work together. All government policies should promote healthy hearts, not just those of the health ministry; healthcare systems should direct funding to prevention as well as treatment. NGOs and agencies should ensure turf wars do not interfere with common goals. Such

coherence requires collaboration, both among similar bodies and between different types of stakeholders.

● **Never forget that prevention is a highly political issue, not just a medical one:** Any given prevention will not work simply because it is a good idea or demonstrably cost-effective: success depends on whether its execution can garner sufficient support among key stakeholders and the population at large. Population-level prevention struggles in the face of public hostility; collaboration cannot simply be mandated because it is clearly beneficial; even drug adherence is linked to patients feeling in control rather than under orders. In this way,

health systems can learn from how politicians build consensus.

Above all, the size and complexity of the task should not cause excessive pessimism. Prevention as a whole is difficult and individual interventions may turn out to be dead ends. Nonetheless, it has proved its worth repeatedly in the field of cardiovascular disease, primarily in the developed world, where it has the potential to reduce CVD further. Low- and middle-income countries should benefit from these proven methods, but what Dr Jiang says of China equally applies to the whole world: “There is hope, but a lot to do.”

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