

# CARDIO-VASCULAR HEALTH IN THE UK

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High blood pressure is known as the “silent killer” because it has no symptoms, hypertension (high blood pressure) is a major risk factor for stroke and cardiovascular disease. [USAG Livorno PAO / Flickr]

## Counting the cost of cardiovascular disease

Death from cardiovascular diseases (CVD) may have fallen substantially in the UK and across the world, but it remains the single biggest killer, and a sizeable economic burden.

The deaths of 550,000 working-age people across European Union countries from chronic diseases, including heart attacks, strokes, diabetes and cancer, cost EU economies €115 billion, equivalent to 0.8% of GDP annually. This figure does not include the additional loss in terms of lower employment rates and productivity of people living with chronic health problems.

The UK sits in the middle of the European pack, according to the ‘Health at a Glance’ report published by the Paris-based Organisation for Economic Co-operation and Development (OECD) in late November. More than 55,000 Britons die prematurely from ‘non-communicable’ diseases such as CVD each year – a rate of 166 deaths per 100,000 – compared to an EU average of 201 deaths per 100,000.

The charity Heart UK reckons that CVD costs the economy £19 billion

(€22.5bn) per year, of which 46% are direct healthcare costs, 34% in productivity losses and 20% informal care of people with CVD.

### Addressing the root causes

Unhealthy eating, smoking and alcohol consumption contribute to the development of cardiovascular diseases and will cost an estimated \$30 trillion in lost economic output and treatment costs over the next 20 years, according to the World Economic Forum.

Last week, cardiovascular disease was at the top of the agenda of the World Innovation Summit for Health’s (WISH) two-day conference in Doha on global healthcare challenges.

“This year, we have cardiovascular disease, because it is the number one killer in the world. About one-third of deaths worldwide occur as the result of either stroke or heart attack, and this is especially prevalent in rapidly developing countries,” WISH Chief Executive Egbert Schillings said.

For his part, Lord Darzi, a surgeon and former UK government health minister, believes that policymakers have failed to make CVD prevention a major focus of their attention.

“If behavioural and lifestyle factors increasingly drive the majority of years of healthy life lost, then isn’t it time we attack these issues at their causal roots, not just the symptoms?” Lord Darzi asks.

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Darzi's position appears to be backed by the National Institute for Health and Care Excellence (NICE). Its latest guidance on combating cardiovascular disease, issued in September, suggest that adults with a 10-year risk of CVD of 10% or more should be given advice on lifestyle changes before being offered any statin therapy.

### Public health investment repaid

The UK government's approach to tackling the burden of CVD is based around its NHS (National Health Service) Health Check programme, introduced in 2009, and which offers screening for

all healthy adults aged 40 to 74 for CVD risk, and treatment of those at high risk.

However, debate about the scientific foundation and effectiveness of a universal policy approach has been heated recently, following substantial socioeconomic inequalities observed in CVD mortality in England.

In England, people living in the most deprived 20% of neighbourhoods are around two and a half times more likely to be admitted to an emergency ward as the wealthiest 20%, according to the Centre for Health Economics.

These inequalities also reflect much greater premature mortality, and shorter life expectancy, among the most deprived groups. Despite the

controversy, the programme remains policy.

Real terms cuts to healthcare spending across the EU are putting strain on primary care, but former US Treasury Secretary Larry Summers argued last week in Doha that increased government and private-sector investment would be quickly repaid.

"If local resources are sufficient to meet national challenges in most countries, and if substantial extra resources become available, that suggests one should work on global investment in healthcare," said the professor and president emeritus of Harvard University in his keynote speech.

## Prevention is the name of the CVD game

Early prevention is the name of the game these days for the UK's National Health Service (NHS) when it comes to tackling cardiovascular disease (CVD).

CVD can be prevented through drug treatments but this requires at-risk patients to be identified before they become ill. The NHS Health Check programme offers free check-ups to adults over the age of 40 but CVD experts are increasingly looking towards programmes targeted at those most at risk.

Birmingham University research published in November suggests that calculating a patient's risk of getting CVD based on their electronic medical records, including age, gender and smoking habits, is a more cost-effective way to tackle CVD.

Using data from The Health Improvement Network database (THIN), the researchers simulated the outcomes



*Dr Dawn Lombardo is the director of UC Irvine Medical Center's Heart Failure Program. [Cove @UCI / Flickr]*

of different screening strategies for a group of 10,000 patients aged between 30 and 74.

The results suggest that the most cost-effective strategy for screening and early prevention was to rank patients by their calculated CVD risk and invite those at highest risk first. This would involve inviting 8% of the population for screening, rather than everyone aged over 40.

Birmingham University Professor and research leader Tom Marshall contended that "a focused screening programme targeted at those at highest risk, rather than everyone aged over 40, would result in significant cost savings

for the NHS while retaining most of the health benefits. Our research also raises the question of whether other mass screening programmes might be better targeted."

"If you calculate your 10-year risk score and it comes out as higher than 13% it is probably worthwhile having a check-up. A lot of people in this category could benefit from drug treatment. But if your risk score is less than 5% it is very unlikely you need treatment and a check-up would not be a good use of NHS staff time," he explained.

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## Secondary prevention

The NHS's Cardiovascular Disease Prevention Optimal Value Pathway, launched in October, is essentially about picking the low-hanging fruit of prevention, early detection and improved management of high-risk conditions such as hypertension, atrial fibrillation (AF), high cholesterol, diabetes, 'pre-diabetes' and chronic kidney disease. Models such as the Birmingham University programme are likely to form part of the new approach.

More advanced at the moment is the NHS's programme of secondary prevention for those who already have CVD related conditions. The NHS England Cardiovascular Disease (CVD) Outcomes Strategy aims to increase uptake of cardiac rehabilitation from 45% to 65% among patients with coronary heart disease (CHD), and it is gradually edging towards its target.

Cardiac rehabilitation offers physical activity support and lifestyle advice, such

as exercise classes and dietary guidance, to help people living with heart disease manage their condition and reduce their risk of heart attacks or stroke.

Figures released in December indicate that the uptake rate cleared 50% in 2015, although this still means that 6,000 heart patients missed out on cardiac rehabilitation.

"It is hugely encouraging that more patients are accessing rehabilitation services, but there is still much more to be done," said Dr Mike Knapton, associate medical director of the British Heart Foundation.

"There is variation between services which needs to be ironed out to ensure that every patient has access to cardiac rehabilitation which can reduce their risk of suffering another heart attack."

## UK leads the world on cardiac rehabilitation

Knapton's assessment is corroborated by Professor Patrick Doherty, director of the national audit of

cardiac rehabilitation at the University of York.

"The UK now leads the world in uptake to cardiac rehabilitation and prevention for patients following a cardiac event or procedure, with 50% of patients accessing services," said Doherty, although he conceded that "half of patients are still not accessing these services and those that do attend may receive inadequate care as nearly half of programmes are failing to meet the minimum standards".

For a system like the UK's NHS, built around the concept of universal availability of care, targeted services go against the grain. But a publicly-funded service is always alive to managing costs, and the UK already spends an estimated £9 billion on CVD healthcare, a sum which is only expected to rise.

If the UK's CVD strategy is to work, a regime based around targeted early prevention is probably going to be more efficient and cost-effective.

## UK and US at odds with Europe over statin use

Statins are already the United Kingdom's most commonly prescribed medicines – roughly 6 million Brits take the drugs on a regular basis to lower the risk of a cardiovascular incident, in line with US practice. But in continental Europe, views tend to differ.

Statin treatment is typically offered to patients who have had a heart attack or stroke to reduce their risk of a repeat incident.

But whether to increase the use of medication, which works to lower the level of cholesterol in blood, particularly



*How and when to use statins has been a bone of contention for years now. [SimonQ/ Flickr]*

in patients believed to be at potential risk of developing cardiovascular diseases (CVD), is one of the more controversial issues in medicine.

It is also an area where the UK and United States have taken a more aggressive stance than the rest of Europe.

In 2013, the UK's National Institute for Health and Care Excellence (NICE) lowered the risk threshold above which prevention with statins should be considered, advising doctors to prescribe statins for patients with a 10%

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risk of heart disease over the next 10 years.

For its part, a review published this week by the United States Preventive Services Task Force, found that statins were associated with a 36% lower risk of heart attack and 29% lower risk of stroke compared with placebo in a review of data from more than 70,000 patients.

### Lower threshold on the continent

However, the 2016 update of the guidelines issued by the European Society of Cardiology (ESC), retained a threshold of a 5% 10 year risk of fatal cardiovascular disease.

At the ESC's annual congress in August, cardiologists said that the new guidelines emphasised lifestyle and nutrition alongside targets for body mass index and weight, while the ESC's Task Force stated that around 80% of CVD instances could be prevented by behavioural changes.

Meanwhile, high-risk patients who do not have high cholesterol should not be prescribed statins, according to the ESC.

So which stance is correct?

A review in leading medical journal *The Lancet* in September argued that statins prevent around 80,000 heart attacks and strokes every year.

"Our review shows that the numbers of people who avoid heart attacks and strokes by taking statin therapy are very much larger than the numbers who have side-effects with it," said author Professor Rory Collins from the University of Oxford.

"Whereas most of the side-effects can be reversed with no residual effects by stopping the statin, the effects of a heart attack or stroke not being prevented are irreversible and can be devastating," he added.

"Controversy over the safety and efficacy of statins has harmed the health of potentially thousands of people in the UK," adds Dr Richard Horton, editor-in-chief of *The Lancet*.

However, cardiologists have been waging a battle for several years in the pages of the publication and the statin-sceptic *British Medical Journal* for several years, with some physicians disagreeing about whether statins are appropriate for low-risk patients. Others point to side effects including the increased

prevalence of Type 2 diabetes, memory loss and muscle damage.

### Only part of the picture

Statin use is clearly only part of the picture. Despite its more aggressive stance on statin prescription, the UK ranked only 13th across the EU-28, according to the Euro Heart Index (EHI) published in December, which provides a ranking of cardiovascular healthcare systems in 30 countries.

France and Sweden ranked first and second. The EHI concluded that European healthcare systems suffered from a "prevention deficit".

It is also unclear how effective statins are at preventing a first heart attack or stroke in people with cardiovascular disease (CVD) risk factors.

Even so, Professor Arne Björnberg, who chairs the Health Consumer Powerhouse, which publishes the EHI stated that, "more systematic use of therapies such as statins and clopidogrel would save thousands of lives".

For the moment, however, there is little sign of the statin divide being bridged.

## A soft target: EU countries go after sugar in CVD fight

If the UK is a leader among European countries in statin treatment and cardiac rehabilitation, it lags behind in addressing the behavioural causes of cardiovascular diseases (CVD), such as child obesity.

Public health and prevention are the Cinderellas of healthcare. Only 3% of total EU healthcare spending is currently allocated to prevention and

public health programmes, and in some countries, the rate is as low as 1%.

The latest figures from the NHS's national child measurement programme show that one in five children in England is obese in their last year of primary school (ages 10 and 11), while one in three is either overweight or obese. Childhood obesity is not, however, a uniquely British problem.

"More than 60% of children who are overweight before puberty will be overweight in early adulthood, and an estimated 25% of school-aged children in Europe are already overweight or obese. This predicts a grim future, as we know that overweight and obesity are key contributing factors to cardiovascular disease, cancer

and diabetes," says Dr Gauden Galea, Director of the Division of Non-communicable Diseases at the World Health Organisation (WHO) Europe.

A WHO report on junk-food marketing in Europe published last month, meanwhile, described current laws protecting children as "markedly insufficient".

Alongside promoting greater physical exercise, health policy professionals have consistently lobbied governments to impose tobacco restrictions, obesity strategy, sugar tax, food reformulation and labelling. They have begun to gain traction on the latter.

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## Taxing junk food, soft drinks

While tax policy remains exclusively in the hands of EU governments, there has been something of a coordinated move towards levies on sugar across a number of European countries.

Earlier this month, Theresa May's government pressed ahead with draft legislation for a tax on sugar-sweetened drinks, set to begin in April 2018.

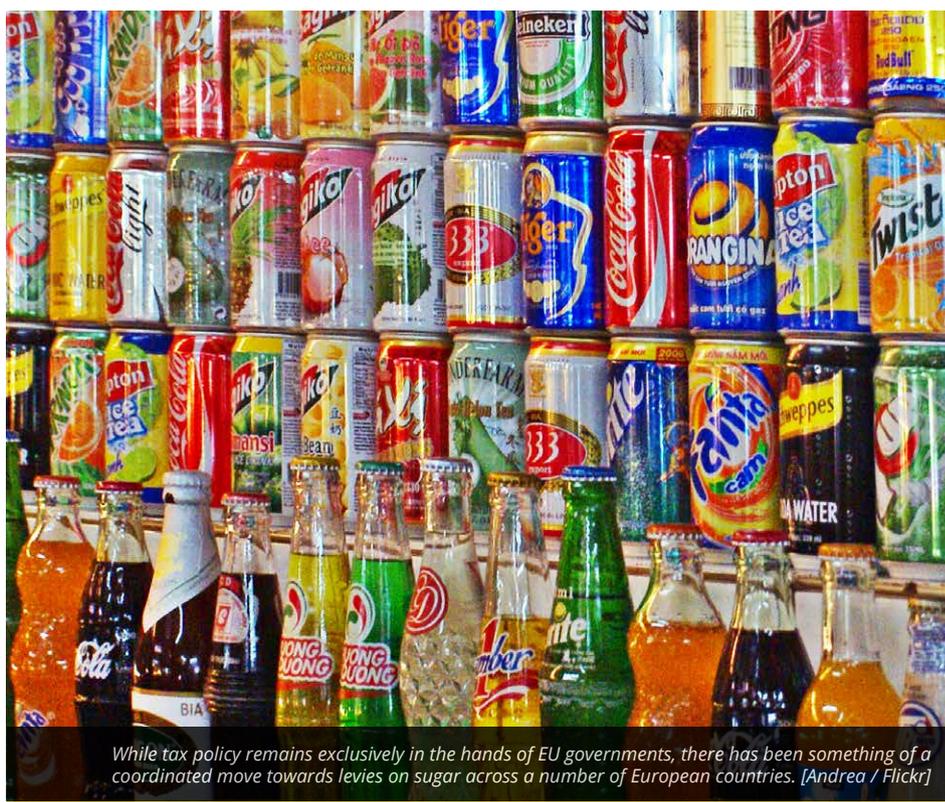
The tax, which had been the brainchild of former Chancellor of the Exchequer George Osborne, will be in two bands: one for soft drinks with more than 5g of sugar per 100ml and a higher one for drinks with more than 8g per 100ml.

While the May government's persistence with the planned tax came as a surprise rebuff to the food industry lobby, with Gavin Partington, of the British Soft Drinks Association, insisting that "there is no evidence worldwide that taxes of this sort reduce obesity", it is part of a wider trend.

Spain and Portugal also announced plans for a two-tier sugar tax in December, while Ireland and Estonia will put in place levies between 2017 and 2018.

France was the first EU country to impose taxes on drinks with added sugar and with artificial sweeteners in January 2012. The tax raises around €400m (£344m) a year. Soft drink sales dropped by 3.3% in 2012 and 3.4% in 2013. The French treasury is now considering whether to introduce a tax on fatty foods.

Finland, Hungary and Denmark have also imposed levies on soft drinks



*While tax policy remains exclusively in the hands of EU governments, there has been something of a coordinated move towards levies on sugar across a number of European countries. [Andrea / Flickr]*

and fatty foods, although Denmark repealed its two domestic laws on sugary and fatty foods in 2013 and 2014 respectively.

### Soft target

In October, the World Health Organisation (WHO) urged all countries to impose sugar taxes, arguing that a 20% increase in the retail price of sugary drinks would result in "proportional reductions in consumption".

Critics such as Christopher Snowden of the right-wing Institute for Economic Affairs think tank, say that the levies are a cynical way for governments to raise revenue and a part of "a campaign to demonise sugar".

If politicians think that sugar taxes

are an easy sell to voters, they won't be a silver bullet in the battle against obesity.

Sweden has acted on school meals, with legislation in 2011 requiring them to be nutritious and free. The nutritional quality of the meals, calorie content and portion sizes are laid down for each age group. Water and milk are the only permitted drinks. For its part, the Scottish government, for which healthcare is part of its devolved powers, is planning to introduce a Good Food Nation bill, with a consultation in 2017.

For the moment, sugar is a soft target. But lawmakers in the UK and the rest of Europe will need to be more ambitious to tackle the root causes of CVD.

## Personalised medicine – the future of CVD treatment?

Doctors are already able to calculate patients' risk of getting cardiovascular disease based on their electronic medical records, including age, gender and smoking habits. Adding genetic assessments to the mix will make their job easier.

The concept of personalised medicine is not new. Physicians have always sought to tailor treatment to individual patients. What is new is the rapid development of pharmacogenomics that enables doctors to predict how their patients might respond to a new medication.

New capabilities in genomics-based technologies are guiding physicians toward therapies and screening regimens that are tailored to their patients' individual genetics and disease risk.

Treatment for cardiovascular conditions in the UK and elsewhere is likely to be in the first line of beneficiaries along with those for cancer and asthma.

Genetic assessments, combined with assessment of lifestyle risk factors, for example, can help those with a family history of cardiovascular disease determine if they are at greater risk for future health complications, plus provide steps they can take to lower their risk.

### Cancer at the forefront

Cancer is one condition where a personalised approach is already more common place. Since all cancer has a genetic base, physicians can offer a genomic, or 'molecular' diagnosis,



*From the Internet of Things to the Internet of the Body: wearable devices and cognitive computing for personal medical assistance. [IBM Research / Flickr]*

helping them to select the most effective treatment. This can be used for a wide range of cancers such as melanoma (skin cancer), leukaemia, colon, brain and breast cancers.

This understanding means that cancer patients can be stratified according to what will be most effective for their condition

In its 'Improving outcomes through personalised medicine' report in September, NHS England predicted that diseases will be classified by their underlying genetic cause by 2025.

For the moment, pharmacogenetics has had more impact in the lab than in new drugs hitting the market. At present, about 20% of the drug market has been impacted by pharmacogenomics so far.

For many medications, a pharmacogenomics link has either not been found yet or doesn't exist.

Research published last week by the universities of Surrey, Reading and Cologne found that the natural mutation single nucleotide

polymorphism (SNP) can protect patients against cardiovascular disease.

"This breakthrough could have a revolutionary impact on healthcare," said Dr Brendan Howlin, Director of Postgraduate Research at the University of Surrey, adding that "since the initial research, we have been developing a series of drugs that prevent the activation process, and are now working on bringing these drugs to market."

### NHS and the 'one size fits all' approach

One of the common criticisms of the NHS is that its 'one size fits all' does not sit naturally with personalised medicine and treatments.

However, doctors are already expected to calculate patients' risk of getting CVD based on their electronic medical records, including age, gender

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and smoking habits, and adding genetic assessments to this mix will make their job easier.

Personalised treatment should also be cheaper and involve less wastage of medicine, since all patients with the same condition receive the same first line treatment even though it may be only 30% to 60% effective. That could have a positive impact on the £15billion that the NHS currently spends on drugs each year.

The NHS launched its Personalised Medicine Strategy in September 2015. Sir Bruce Keogh, the NHS's National Medical Director, promised "improved prevention based on underlying predisposition, earlier diagnosis of disease as a result of identifying abnormality earlier (and) more precise diagnosis based on cause".

It has also launched a 100,000 Genomes Project and 13 Genomic Medicine Centres across England.

Personalised medicine is likely to change the face of cardiovascular treatment. The question is whether the UK will be one of Europe's leaders or laggards in the field.

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