Saving the planet as well as lives

The NHS has committed to reducing its carbon footprint, but has it got the influence required to produce the necessary changes? **Andrew Cole** reports

It is fair to say that carbon reduction has not had a high priority in the NHS compared with waiting lists, hospital acquired infections, and general practice opening hours. But the recent launch of the new NHS carbon reduction strategy,[1] fronted by chief executive David Nicholson, might be about to change that.

The report by the NHS Sustainable Development Unit includes some eye popping figures about the carbon waste in the English health service, which amounted to 18.6 million tonnes in 2004, equivalent to a quarter of all public sector emissions and 3.2% of the country's total footprint.

But what will really concentrate minds are the targets. Despite the fact that in the past 20 years the health service's emissions rose by 40%, it is now committed to reversing that trend and cutting them by 10% by 2015 and a staggering 80% by 2050.

If that is to happen one of the first priorities will be tackling the huge carbon cost of our drugs and medical equipment. Detailed analysis of the NHS's carbon footprint shows that drug procurement is responsible for 22% of total emissions—as much as travel or buildings—and medical equipment for 9%.[2]

One of the reasons for these startling figures is that the report takes into account indirect as well as direct emissions. That means the drug footprint, for example, includes not simply the costs of transport, waste, and misuse by the patient but also the manufacturing process and even supplying the raw materials to the plant.

And what emerges is that these indirect carbon costs around manufacturing are far higher than the direct ones—accounting for 80% of pharmaceutical emissions and 70% of emissions for medical equipment and instruments.

Just as importantly, production in countries outside the Organisation for Economic Cooperation and Development (OECD) seems to be far more wasteful of carbon than that in the OECD, including Europe and the United States. So although non-OECD countries are responsible for 17% of drug production costs, they account for over half of all emissions. Non-OECD countries were also responsible for 21% of medical equipment production costs but 47% of emissions.

The report concludes that to reduce the carbon footprint of drugs, the NHS must not only cut consumption but examine how to make their manufacture less carbon intensive. It suggests purchasers could consider using their purchasing power to draw up "green" contracts with leading drug companies.

"It will make good business sense for every organisation and industry to take this agenda very seriously," says the Sustainable Development Unit's operational director, Sonia Cointet.

"We are a massive organisation that buys a huge amount of things. We should be able to use our collaborative purchasing power to have an influence. If we could get everybody saying this is important and start including statements in procurement contracts we could make a real difference."

She does not accept that any shift in

production from higher to lower carbon countries would inevitably lead to costlier drugs. "It would be tragic if every time we ask for new criteria all that means is that the prices go up. I am hoping that those organisations that want to have a competitive edge won't be making it up with additional costs."

Efficient use

The NHS does of course have more direct control over the other end of the equation—the consumption of drugs. Ms Cointet believes there is much it can do to cut the amount of drugs used and so reduce the quantity manufactured in the first place. This would include changing prescribing practice, looking for alternatives to medication, reduced waste, and ensuring better adherence.

One of the most effective ways of policing these changes will be to use NHS staff themselves. There was an almost unprecedented level of response to the consultation on this strategy, with most responses suggesting the health department had not gone far enough.

"This is the best form of accountability," she says. "If doctors, for example, question the drugs being prescribed and the doses in which they're delivered and are more aware of environmental issues this would make a massive difference."

It will be an enormous challenge. Initiatives to cut drug waste are still scarce. The Oxford Radcliffe Hospitals Trust has introduced a scheme to ensure unused drugs over a certain price are returned to the hospital pharmacy rather than thrown away.

The policy has saved £300 000 a year in the trust's £17m drugs budget while cutting carbon at the same time. But Graham Cripps, the trust's pharmacy, purchasing, and distribution operational manager, believes this amount is small compared with the carbon and cost savings that could be made through a leaner supply chain and more rigorous prescribing patterns.

"The bottom line is reducing what's being supplied in the first instance, and this is where it gets very complicated. We need everyone thinking in the same way and not supplying unless it's absolutely necessary and only in appropriate doses."

"The NHS must not only cut consumption but examine how to make drug manufacture less carbon intensive"

But the medicines that cost the NHS—and the environment—the most are probably those that are used incorrectly or wasted altogether. The National Pharmacy Association estimates that more than half the population, and three quarters of elderly people, don't use their medication optimally. The health department has commissioned a review, to be published later this year, examining wastage and why people fail to adhere to drug treatment.

Greener manufacturing

Nevertheless, if the NHS is to hit its targets it will also have to reduce carbon emissions from the manufacturing process itself. David Wathey, head of sustainable development at the NHS Purchasing and Supply Agency, admits the service is currently "in the foothills" in tackling this. The agency hopes to produce guidance this autumn on carbon reduction in drug procurement. But it seems unlikely at this stage it will include manufacturing.

The critical question is how the drug companies will react to demands for greener thinking. A spokesman for the Association of the British Pharmaceutical Industry insisted the industry was already working hard to reduce energy use, pointing to a commitment by GlaxoSmithKline to cut its carbon emissions by 20% by 2010 and 45% by the end of 2015. Meanwhile Eli Lilly has set a global 15% energy efficiency improvement target by 2013.

The association also queried the discrepancy highlighted in the report between OECD and non-OECD carbon outputs, pointing out that its environmental standards apply to all countries in which its drugs are manufactured. A GlaxoSmithKline spokesman insisted all its products were made with the same processes and followed the same regulations regardless of where they were manufactured.

Despite this, manufacturing drugs remains a highly carbon intensive process where, according to James Clark, head of the Green Chemistry Centre of Excellence at York, it is still widely accepted that 99% of the raw materials used will end up as waste.

This will not change radically without a fundamental reconsideration of the way drugs are produced in the first place, he says. The centre's own analysis of the potential for change showed that, although many chemists

MEDICAL INSTRUMENTS

The strategy document proposes a review of the relative merits of sterilising and reusing medical instruments rather than disposing after single use. The review is partly driven by the strength of feeling among many staff taking part in the consultation that disposable use has gone too far and is responsible for much unnecessary waste.

"It is possible we have taken the balance of risk too far, although obviously patient safety and patient outcomes are always going to be uppermost," says the Sustainable Development Unit's Sonia Cointet. "I would like to see an evaluation of decontamination versus single use, particularly for metallic items. We need a really full and objective debate about this issue."

But Andrew Thomas, from the British Orthopaedic Association, says the main reason for the shift to disposable instruments came in the 1990s after the emergence of variant Creutzfeldt-Jakob disease, and the risks of transmission still remain.

Not all instruments are disposable, he says. Many metal instruments such as scissors and clamps are still reused. But others are now single use for good reasons. The saw blades and canulated drills used in orthopaedic procedures, for instance, tend to go blunt so need to be replaced.

Doctors and nurses are also increasingly switching to paper drapes and gowns because the cotton equivalents can more easily be penetrated by blood and other body fluids, making them an infection risk.

But Mr Thomas also questions whether decontamination would be any less carbon intensive. "Over its life cycle you may use as much energy decontaminating a cotton gown as you do in manufacturing a paper gown."

He wants to see more emphasis on recycling disposable items once they have been discarded. He also criticises the health department's decision to centralise all decontamination facilities, leading to unnecessary extra journeys. "The instruments from, for example, the orthopaedic department are collected at the end of the procedure, stuck in a van, and driven many miles to be decontaminated and then driven back. This is completely misguided."

involved in the process stages knew about the high carbon impact of what they were doing, they were often hampered by the way the drug had been created in the first place.

"One of the most important take home messages was that we needed to work more with the people at the discovery stage. These people's drivers are completely different—it's all about discovering active drugs, not about the impact of the process. So communication within the industry is a really critical issue."

But he believes that given the motivation there is virtually no limit to the carbon reductions the industry could make. "The real barrier is people's will, not the science."

If the NHS were to use its purchasing power to insist on greener production that could have a major impact on the industry, he predicts. "I do feel the industry could move very positively with the right incentives. This could be the biggest factor by a mile, and it would have an enormously beneficial effect across the industry."

Question of influence

It will nevertheless require a very big turnaround, and there is some doubt whether the NHS has the weaponry to achieve it. One potential problem is the procuring process itself, which despite recent rationalisation remains labyrinthine, from the national purchasing agency through "collaborative procurement hubs" down to individual trusts. Each level has responsibility for different elements of purchasing, but devolution of power means the health department can no longer tell trusts what to do.

And it has to be asked just how much purchasing power the NHS really has over the drug industry. The NHS accounts for 80% of the UK market but most drug companies are multinational operations. The UK, for instance, makes up just 4% of GlaxoSmithKline's worldwide business.

Ian Roberts, professor of epidemiology and public health at the London School of Hygiene and Tropical Medicine and a member of the Carbon and Health Council, also doubts whether the health department is truly willing to rattle the cage of the drug giants.

"The political clout of the drugs industry is quite considerable and it is very influential at high levels. What's much more likely to happen is that if anyone applies pressure on a pharmaceutical company it will simply threaten to shift somewhere else."

He is also concerned at the absence of "must dos" in the NHS strategy. Chief executives responded to the 18 week waiting time target because their jobs depended on it. "If the same thing happened for greenhouse gas reductions and every hospital was required to hit certain targets or face naming and shaming then I think you'd see real action pretty quickly. But at the moment I remain sceptical. I bet they're not talking about greenhouse gas emissions in most boardrooms at the moment."

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Competing interests: None declared.

1 NHS Sustainable Development Unit. *Saving carbon, improving health: NHS carbon reduction strategy for England*. 2009. www.sdu.nhs.uk/page.php?area_id=2.
2 NHS Sustainable Development Unit. *NHS England carbon emissions carbon footprinting report*. 2008. www.sdu.nhs.uk/downloadFile.php?doc_url=1233327092_mHfy_nhs_england_carbon_emissions_carbon_footprinting_r.pdf.

Cite this as: *BMJ* 2009;338:b933

See ANALYSIS, p 746, and EDITORIAL, p 728

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See editorial by Ian Roberts, *BMJ* 2009;338: b326

ANSWERS TO ENDGAMES, p 779

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PICTURE QUIZ

1 Magnetic resonance imaging shows bilateral thalamic infarcts with a larger lesion on the left thalamic nucleus than on the right (fig 1). A few small foci of hypodensity are indicative of small haemorrhages. The overall findings suggest basilar artery embolisation.

2 Transoesophageal echocardiography with contrast shows bubbles of contrast in the right atrium being shunted into the left atrium through the interatrial septum (fig 2). This confirms the diagnosis of a patent foramen ovale (PFO).

3 The initial management of the patient involves recognition of acute brainstem stroke and consideration of thrombolysis.

4 It is important to investigate stroke in young patients thoroughly because many causes are treatable and preventable. Tests should include assessment for risk factors, magnetic resonance imaging of the head and neck, and a transthoracic echocardiography (with contrast).

5 This patient had the confirmed presence of both a PFO and a cerebrovascular accident, so the most appropriate treatment was percutaneous closure of the PFO.

STATISTICAL QUESTION

Uncontrolled studies

a, b, d

Fig 1 Magnetic resonance imaging of the brain showing bilateral thalamic infarcts with a larger lesion on the left thalamic nucleus than on the right. A few small foci of hypodensity are indicative of small haemorrhages

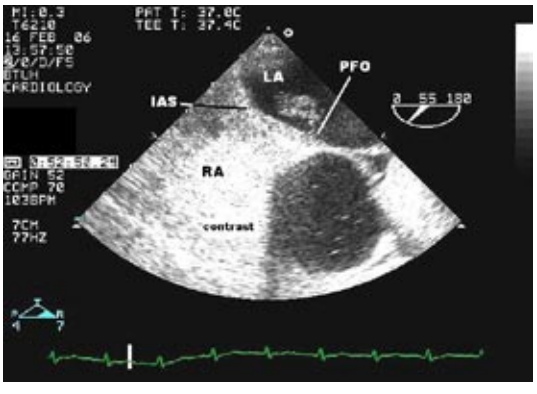

Fig 2 Transoesophageal view of the patent foramen ovale (PFO) with contrast crossing through. The interatrial septum (IAS), the right atrium (RA), and the left atrium (LA) are highlighted