

**Andrew Selous (South-West Bedfordshire) (Con):** I am delighted to have the opportunity to discuss this serious issue.

A company in my constituency called ProEconomy is a successful business that has controlled legionella in water systems since 1993. It told me only this morning that there has not been a single case of legionella in any of the premises for which it has been responsible. I am grateful for the opportunity to put forward some of its concerns.

The Health and Safety Executive produced a document, the approved code of practice and guidance, entitled “Legionnaires’ disease: The control of legionella bacteria in water systems”, which was published in 2000. It recognised several ways of keeping water systems free of legionella. One of those, mentioned on page 42, paragraph 169, is under the heading “Temperature regime” and states:

“This is the traditional approach to Legionella control.”

Copper-silver ionisation, the technique that the company in my constituency applies, is listed as a treatment programme on pages 44 and 45 of the document, in paragraphs 175 to 178. Furthermore, in paragraph 185 on page 46, under the heading “Monitoring for legionella”, it is recommended that

“this should be carried out...in water systems treated with biocides where storage and distribution temperatures are reduced from those recommended in the section on the use of temperature to control Legionella.”

The risk of contracting Legionnaires’ disease is greater in NHS premises than elsewhere, because the immune systems of people there are suppressed, so the Department of Health recently updated its guidance document, the health technical memorandum known as HTM04. It is designed specifically for NHS premises and took five years to produce. It recommends in the introduction and on page 24 that

“the temperature control regime is the preferred strategy to maintain systems free from Legionella and other water-borne organisms”

and that

“the water temperature should be at least 50° C after draw-off for 1 minute.”

Furthermore, in its recommendation, the report strongly recommends that

“thermostatic mixing devices should be considered for many outlets”.

Because of the use of the word “preferred” in HTM04, customers of ProEconomy who have until now happily and successfully applied the copper-silver ionisation process are moving back to a regime of temperature control after years of legionella-free water and water systems that ran at temperatures lower than those recommended in the document. ProEconomy has therefore not only been jeopardised but is concerned that HTM04, which was written without taking into account research

showing the inefficacy of temperature control, represents a substantial risk to the public.

Legionnaires' disease does not just affect the elderly. I shall give some examples. In Torbay in 2002, David Bick, at only 53 years old, died after being infected

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from the sink alongside his bed. In 2004, Daryl Eyles, a young father of 37, died from legionella found in the water system of the Royal United hospital in Bath. In 2001, there were 449 confirmed cases of Legionnaires' disease in Spain, and only last week a 78-year-old lady died in the Netherlands.

Legionnaires' disease is a killer, or makes people extremely ill if it does not kill them. We should not underestimate it. How are the Government dealing with it? When ProEconomy expressed concerns about the recommendations made in HTM04, it was assured that the overall scientific evidence supported the temperature control regime of having water at 50° C and above, after the drawing-off of hot water taps for one minute.

The Minister of State, Department of Health, the hon. Member for Leigh (Andy Burnham) wrote in a letter that

“the strength of evidence continues to support a pathogen control strategy based primarily on keeping hot water above specified temperatures throughout hospital systems as appropriate. Similar arguments apply in terms of cold water temperature limitations.”

However, the business in my constituency was unwilling to accept that, and requested on three occasions to see the evidence. It was only when it put in a freedom of information request that it was given the evidence that the Government are effectively using to put it and the rest of the industry out of business. I wish to register my considerable concern about that.

Under freedom of information law, 31 scientific papers were produced, and they have been examined by a team of university graduates and legionella experts whom ProEconomy asked to assess them. They concluded that none of the 31 papers supported the temperature control regime. Three were against it, 21 did not discuss it at all and seven were in favour of copper-silver ionisation. That has been found to be safe because of the minimal concentrations required to control legionella. Those concentrations are particularly safe compared with using chemicals such as chlorine and chlorine dioxide, which were treated on a par with copper-silver ionisation in HTM04. The silver levels required are equal to those found in milk and within the values prescribed by the drinking water inspectorate. I have to hand the inspectorate's certificate, which confirms that it is happy with the technique. The copper released in copper-silver ionisation systems is well below the current prescribed values, and most water distribution pipes are made of copper.

In America, copper-silver ionisation is welcomed and used widely as an effective method of controlling legionella. It has received the most extensive research of all the available methods and is the only disinfection modality to have fulfilled the four evaluation criteria set out by the university of Pittsburgh and the veterans affairs medical centre of Pittsburgh. Their report states:

“It demonstrated efficacy of Legionella eradication in vitro using laboratory assays, anecdotal experiences in preventing legionnaires disease in individual hospitals, controlled studies in individual hospitals, and in validation in confirmatory reports from multiple hospitals during a prolonged time (5 to 11 years).”

The study also evaluated applying temperatures of 70° and concluded that

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“contamination with Legionella will often recur within months”

using the temperature control regime.

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“Furthermore, it is tedious and labour intensive to implement.”

I would add that it is expensive.

Copper-silver ionisation is also welcomed in the Netherlands. A recent Dutch trial carried out over a one-year period at nine establishments, including hospitals and prisons—two of them were using ProEconomy’s system—and funded by the Dutch Ministry of the Environment concluded that

“copper/silver ionisation is an effective method for the control of Legionella in complex tap water systems...The results of this study also indicate that this method can be used within the legal limits for drinking water.”

As more and more countries become aware of the inadequacies of the temperature control regime, copper-silver ionisation is becoming increasingly favoured. Yet Great Britain, once a pioneer in the technology, is now losing ground to the rest of the world—Canadian, American and Dutch companies. ProEconomy is not the only company that does it in the UK—there are about five, and all face going out of business. We will lose our technological lead to other countries.

Of the 31 papers that were provided by the HSE only under a freedom of information request, it is staggering that one paper supposedly in support of the temperature control regime, by Pablo Visca for the university of Rome, found that

“repeated heat based control measures were ineffective in eradicating Legionella.”

Furthermore, Roland Schulze-Roebbecke of the University of Bonn concluded that

“frequent failure to eradicate Legionella by elevating the water temperature indicates that it is impossible to achieve effective temperature levels concomitantly in all parts of the system.”

In a paper on the subject, Dr. Yu-sen Lin concluded:

“Copper-silver ionisation has effectively controlled Legionella in the hot water systems of numerous hospitals.”

The temperatures required by HTM04 pose a risk of scalding to the extent that they cannot be employed without the installation of thermostatic mixing valves, which I believe were the subject of a recent private Member’s Bill. The valves mix the heated water with untreated cold mains water to achieve a non-scalding temperature, which is the ideal temperature for legionella growth. HTM04 contradicts itself by conceding that

“water quality can deteriorate in mixing valves, particularly when utilization is low, because the mixed water then becomes stagnant at a temperature favoured by pathogens such as Legionella.”

It seems irresponsible that the part A executive summary of HTM04 “strongly recommends” that valves be installed. Indeed, a paper produced by the Department of Health clarifies the point. It states:

“Mixing valves where cold and hot water are mingled in order to achieve 45°C become the principal reservoirs for Legionella in a hospital.”

Mixing valves have been and continue to be widely installed in hospitals and public buildings. Hospitals may have up to 1,000 mixing valves, at a cost of £150 each—£150,000—plus the cost of installation and maintenance, which is required every six months in a typical large acute hospital.

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For 14 years, ProEconomy has eradicated legionella using copper-silver ionisation at places such as the Medway Maritime, Northampton general and Royal Alexandra hospitals, and the Hong Kong and Shanghai Banking Corporation headquarters at Canary Wharf—I believe that it is home to some 8,000 employees—to name but a few. ProEconomy has found legionella at significant levels, despite adherence to the temperature control regime, in 90 per cent. of the hospitals that it visits for the first time. That might be because the temperature regime does not require legionella testing but asks hospitals only to monitor temperatures. That strikes me as burying one’s head in the sand, because monitoring temperatures on its own does not prove anything. Only by regular testing for legionella can one be sure that it is not there, and that is part of what ProEconomy and other companies do. The extra cost for testing for legionella is outweighed by the proof that one is in control of and free of legionella.

ProEconomy has successfully reduced temperatures and removed mixing valves in large hospitals. Because HTM04 prefers the temperature control regime, ProEconomy has lost contracts to the value of £75,000. One of those contracts was with the Oxfordshire health trust, which used ProEconomy's systems in 12 premises and has been legionella-free for nine years. The trust is now spending an estimated £180,000 to install mixing valves, so that it can raise temperatures. The director of the trust clearly did not wish to put his head on the block and go against the HTM04 preferred option, and who can blame him?

Medway Maritime hospital, which removed its mixing valves and reduced temperatures four years ago when it installed ProEconomy's product, is now uncomfortable with its legal situation, having read HTM04. Despite being completely satisfied with copper-silver ionisation's effectiveness in eradicating legionella, it is considering reinstalling mixing valves at a cost of £200,000. Are NHS budgets not under enough pressure already?

HTM04 has an impact not only on ProEconomy's business; it also affects the Government, who have set a target of a 20 per cent. reduction in CO2 emissions and at the same time are investing in raising temperatures. That will significantly escalate the carbon footprint of the whole of the NHS estate.

Furthermore, the fact that the Department has spent time and public money producing guidance that does not appear to be supported scientifically should raise considerable concern. ProEconomy is adamant that the Department has failed to justify or substantiate its statement that the temperature control regime is the preferred strategy for controlling legionella. ProEconomy would like the Minister to explain why the temperature control regime, which has been demonstrated to be inadequate in various instances, should be given preference over copper-silver ionisation. ProEconomy and the other companies in the field believe that they can prove that copper-silver ionisation is cheaper, more energy efficient and wholly more effective.

Furthermore, in the light of the fact that, over a 20-year period, a typical hospital would save £375,000 in energy consumption using copper-silver ionisation instead of the temperature control regime and taking

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into account the cost of replacing copper-silver ionisation systems with mixing valves, ProEconomy estimates that there would be significant extra costs to the NHS if HTM04 were to be followed to the letter.

That is a summary of the concerns. The Minister and I are not scientists—I am putting on the record the views of my constituent's company—but I am sufficiently concerned about the process, the fact that scientific papers were not available and the fact that other large, industrialised, scientifically advanced countries seem to deal with the problem differently. It is wholly legitimate for me to raise these serious questions in this Chamber, and I hope that the Minister has reflected on them. As I said, he and I are not scientists, but I hope that he shares my concerns and will, at least, seriously

consider the matters that have been raised, particularly the word “preferred”, which will sound the death knell for the UK industry.

1.16 pm

**The Parliamentary Under-Secretary of State for Work and Pensions (Mr. James Plaskitt):** I congratulate the hon. Member for South-West Bedfordshire (Andrew Selous) on securing this opportunity for us to debate this important subject. I commend him for speaking up on behalf of ProEconomy Ltd, a company in his constituency whose interests clearly lie at the heart of the debate.

The debate has shown clearly why it is important to have proper and effective water management systems in place to control the risks from legionella bacteria. The Government fully recognise the serious consequences if those risks are not adequately controlled. That is why there is a clear health and safety regime to minimise risks to people arising from legionella. Under health and safety law, it is primarily the duty of an employer or person in control of the premises to ensure that that happens.

Legionnaire’s disease was first identified after a large outbreak of pneumonia among people who attended an American Legion convention in Philadelphia in 1976. A previously unrecognised bacterium was isolated from lung tissue samples and subsequently named *Legionella pneumophila*. The bacteria occur naturally in environmental water sources such as rivers, lakes and reservoirs. They are usually found in low numbers but appear to multiply at temperatures between 20° C and 45° C. The bacteria can colonize artificial man-made water systems such as cooling towers and the hot and cold-water supply system in buildings. When the bacteria are found in large numbers, they can cause problems.

Humans exposed to the bacteria may contract Legionnaire’s disease, normally by inhaling the bacteria deep into the lungs, either as tiny droplets of water or as the contaminated particles left after evaporation. The incubation period is usually between two and 10 days.

As the hon. Gentleman said, exposure may have serious consequences. Not everyone exposed to the bacteria will develop the full-blown disease. Some will suffer from no more than mild flu-like symptoms, but cases may be far more serious, and, tragically, death

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may occur. On average, some 300 cases of Legionnaire’s disease are reported each year in the United Kingdom, but about half are associated with travel abroad. Twenty-nine deaths were recorded in 2005, and more than 30 in each of the previous three years.

I should quickly say something about the legal context, as it leads to the points that have been raised. The primary responsibility for controlling risk lies with the employer or the person in control of premises. Those who use or run water systems in

their workplaces or other premises must assess the risk and provide for systems that manage it sensibly and effectively.

The legal duty is set out in health and safety legislation. There are general duties on employers and operators to provide safe and healthy working environments under the Health and Safety at Work, etc. Act 1974. Employers and operators also have responsibilities under the management of health and safety at work regulations. More specifically, the Control of Substances Hazardous to Health Regulations 2002, which I will refer to as COSHH, provide a framework for control of the risks from a range of hazardous substances, including biological agents such as the legionella bacterium.

The essential elements of the control framework provided by the COSHH regulations are: assessment of risks from exposure to an agent; prevention of that exposure where risks are harmful; control of exposure where prevention is impracticable; maintenance, examination and testing of control measures; provision of information, training and instruction; and health surveillance of employees. Those responsibilities are fairly and squarely on the shoulders of the employer or the person in control of the premises.

To assist those responsible for managing the risks associated with legionella, the Health and Safety Executive has published guidance and an approved code of practice entitled “Legionnaires’ disease: the control of legionella bacteria in water systems”—commonly known across the industry as L8. The code of practice gives practical guidance, but there is also a special legal status attached to an approved code of practice. Under health and safety law, duty holders may use alternative means of compliance, but if they were to be prosecuted, failure to follow a code would be taken as being indicative of a breach of law, unless an employer could prove the adequacy of those alternative means of compliance.

**Andrew Selous:** In case I have missed something, has the Minister said anything that would lead an employer to have to use a temperature control regime? I apologise if I have missed the answer to that question.

**Mr. Plaskitt:** No—the simple answer is that there is not anything that would do so.

The approved code—L8—explains that the risk from exposure will normally be controlled by measures that do not allow the proliferation of legionella bacteria in the system and reduce exposure to water droplets and aerosols. Many suggested precautions are cited in the document.

Although L8 was written with the best knowledge available at the time, the HSE recognises that new

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technologies are continually being developed and introduced to the market. As with any new technology, the regulator will recommend a precautionary approach in adopting a new method of control, particularly when the consequences of failure can

be—as in this case—so serious. To support innovation in the field of legionella control, the HSE is keen to engage industry and to discuss and offer advice on potential technologies while working closely with the Legionella Control Association, the Water Management Society and the British Association of Chemical Specialities.

To help ensure the effective communication of good advice, the HSE has formed the legionella committee. One of its aims is to develop a more coherent and consistent approach to the inspection and investigation of legionella-related plant and management systems with stakeholders, particularly local authority partners. The HSE works closely with the Legionella Control Association, which is an independent body that aims to improve health and safety standards in the water treatment industry. By working closely with that body, the HSE can reach a large number of people working in the industry and help to ensure that key safety messages are fully assimilated and applied.

Following consultation with the Legionella Control Association, the technical committee of the Water Management Society and the British Association for Chemical Specialities, the HSE legionella committee has recently produced further guidance. That guidance is intended to be the first in a series and will deal with fill pack removal in cooling. It will shortly be placed on the HSE website as a technical supplement to L8. Provided a suitable evidence base is available, the HSE committee intends to issue technical guidance in that way, which will mean that advice and guidance on the introduction and application of new water treatment techniques can be made available.

The HSE has also produced industry and sector-specific guidance, for example for residential care homes. Such guidance can be downloaded from the HSE website, to which the most recent addition was “Management of Spa Pools”, produced in 2006. Recorded data indicate that spa pools are one of the three main sources of Legionnaire’s disease in England and Wales.

The HSE co-operates with the Health Protection Agency and the Health and Safety Laboratory on further research. The existing framework for control of legionella, set out in the approved code of practice, was based on consensus about what was recognised to be the best science at the time. However, the Government and the HSE recognise that the science can move on. We want to review our advice in the light of new developments and actively to support the ongoing process of scientific inquiry. For example, the HSE and the Health Protection Agency are currently collaborating on a project looking at the relationship between legionella risk systems and the environment, and the virulence of individual strains of legionella. Another project on which we are working is looking at in situ cleaning techniques for cleaning packing materials in cooling towers.

On the core of the hon. Gentleman’s point, the Government do not rule out the use of other techniques such as water ionisation as a means of control. In fact the HSE’s guidance devotes several

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paragraphs to the use of such methods of control. Temperature is referred to as the traditional approach to legionella control. It is recommended that hot water be stored at 60° C and distributed so that it reaches the outlets at 50° C within one minute. At

60° C it takes approximately two minutes to inactivate 90 per cent. of a population of legionella. The effectiveness of maintaining the circulating temperature at 60° C has been demonstrated in both hospitals and hotels. Hot water systems maintained at temperatures above 50° C are less frequently colonised by legionella.

Ionisation is the term given to the electrolytic generation of copper and silver ions for use as a water treatment. Metals such as silver and copper are well known bactericidal agents. They act on the cell wall of the micro-organism, which leads to cell death. Provided copper and silver ions are maintained at suitable levels within the system, they can be effective against legionella. It is important that ionisation be properly assessed, designed and maintained as part of an overall water treatment programme. In hard-water systems, for example, silver ion concentrations can be difficult to maintain due to build-up of scale on the electrodes, unless anti-scaling electrode cells are employed.

For both hard and soft water, the ionisation process is pH sensitive and it is difficult to maintain silver ion concentrations above pH 7.6. The build up of scale and concentration of dissolved solids therefore needs to be carefully controlled so that suitable ion levels are consistently maintained throughout the system. That may require additional water treatments. Also, unless automatic control valves are employed, the system is subject to fluctuations in concentration. Furthermore, if the treatment is used continuously, it is necessary to check that the maximum permissible concentration for drinking water under current legislation is not exceeded. That can be found in the Water Supply (Water Quality) Regulations 2000.

**Andrew Selous:** Will the Minister come to the nub of the matter regarding health technical memorandum 04 and the health service? I am reassured by what he said about the HSE, but it is the use of the word “preferred” in HTM04 that will close down the industry in the UK.

**Mr. Plaskitt:** I do not accept that it will close it down. As I am trying to explain to the hon. Gentleman, the documentation considers alternative sciences and we do not rule out any system or say that one system must be used instead of another. That is why I am discussing in detail the context in which the guidance was issued. I am also trying to point out that the science is continually under review and that the guidance will be supplemented as we consider scientific developments. I do not accept that the situation is as closed off as the hon. Gentleman is implying.

**Andrew Selous:** As I have tried to explain to the Minister, the use of the word “preferred” in HTM04 means that people who work in the public health sector believe that if they use another system, they will be publicly liable. Will he address that specific point because it is of great concern to the industry?

**Mr. Plaskitt:** I have tried to address that point specifically. If the hon. Gentleman wishes to check

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*Hansard*, he will see that I dealt with exactly that point. The Department of Health has produced additional guidance for NHS hospital trusts. It states that temperature control is the preferred strategy, but it also acknowledges the appropriateness of other systems and includes extensive reference to silver and copper ionisation and other techniques, so that—this is the crucial point—trusts are free to choose a temperature control option if local circumstances suggest that it is appropriate.

The Department of Health conducted a review of the available scientific literature in 2006 and concluded that both systems had merit.